Small Specialty Coffee Farmers' Decision-Making Factors in an Asymmetric Information Market Environment

Gustavo Pena Ramírez, Jhon Jairo Vega Diaz, Arnold Wentzel

Conflicts of Interest Statement

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Gustavo Peña Ramírez: Conceptualization, methodology, research, resources, data acquisition, software, formal analysis and writing original draft. **Jhon Jairo Vega Díaz**: Project leader, conceptualization, methodology, formal analysis and writing original draft. **Arnold Wentzel**: Project leader, conceptualization, methodology, formal analysis and writing original draft.

Small Specialty Coffee Farmers' Decision-Making Factors in an Asymmetric Information Market Environment

Peña R., Gustavo[1] - https://orcid.org/0000-0003-4263-4725

Vega D., Jhon Jairo[2] - https://orcid.org/0000-0002-2165-8536

Wentzel, Arnold[3] - https://orcid.org/0000-0002-7039-7213

1. Universidad Antonio Nariño; gpena67@uan.edu.co
2. Universidad Antonio Nariño; jvega66@uan.edu.co
3. Universidad Antonio Nariño; arnold.wentzel@uan.edu.co

ABSTRACT

The global "Specialty Coffee" (SC) market is expected to grow from USD 53.67 Billion in 2021 to USD 152.69 Billion by 2030, at a CAGR of 12.32% during the forecast period 2022-2030. This growth mainly depends on prices coordinating the SC supply chain through information exchange. However, the current coffee price crisis threatens the sustainability of the coffee industry and the livelihoods of millions of coffee-growing families due the information asymmetries. This study investigates the determinants of SC prices that influence the optimal selling decision of small SC farmers, So, the main contribution of this study is that, we found seven relevant factors that impact SC prices, factors which have been studied by different researchers but in an isolated manner, taking into account these factors at the same time, small specialty coffee farmers could make optimal selling decisions by

choosing the best coffee price. The study used: IBM software chi-squared statistic and thematic analysis to determine the mean selling decisions factors which stablish the price of coffee. Primarily data was collected from 52 small SC farmers from Planadas Tolima involved in the local business adopting a purposive sampling technique. Research findings revealed a positive correlation between price and the seven independent variables object of this study with a significance of 95%. We concluded that there is a need to consider the variables being studied to solve the information asymmetries in the small SC industry so farmers can make optimal selling decisions. As knowledge of the availability of market information factors examined along the coffee supply chain is deeply understood, we might be able to provide the measurement of information asymmetry in the SC industry and propose a solution in order to solve the SC market disparities to benefit small farmers.

KEYWORDS:

Asymmetric Information; Selling Decisions; Specialty Coffee Market; Small Farmers; Coffee Price Crisis; Coffee Industry Sustainability.

JEL CLASSIFICATIONS

Q13, P42

1 Introduction

Around 125 million people worldwide depend on coffee for their livelihoods. Coffee is the most valuable and widely traded agricultural product, and 25 million small farmers produce 70% of the world's coffee (Krishnan & Krishnan, 2017; Acosta et

al., 2019). The Colombian coffee industry has been of particular relevance to the economic and social stability of the country. It is a significant factor in shaping rural development in the post-conflict environment. However, historically low prices in the conventional coffee market have caused financial and social hardship, creating a rupture in social cohesion and social conflicts (Wollni and Zeller, 2006; Sánchez and Cifuentes, 2021).

Smallholder farmers have a mixture of problems such as economic sustainability, the effects of climate change, coffee price crises, the vulnerability they are due the lack of negotiation power, access roads, communication infrastructure, and lately, the COVID-19 pandemic that has hit actors across the coffee value chain, among others.

Different mechanisms used throughout decades to determine coffee prices have kept it high, although higher prices did not always benefit producers (Sachs et al., 2019). Hence, millions of small coffee producers are currently suffering an economic crisis and many of them are leaving the rural areas concerned about their financial future caused by the coffee price crisis. Current and future impacts of the coffee price crisis threaten the sustainability of the coffee industry and the livelihoods of millions of coffee-growing families (Osorio, 2002; SCA -PRI, 2019).

In the face of this crisis, SC markets have attracted the attention of small coffee farmers, which has helped a few of them to improve their income. The SCA, 2007 cited by Donnet et al., 2007 says SC is a growing market segment in an otherwise declining industry and exhibits price premiums in international markets. The profitability of the SC sector and its growth potential have led to industry consolidation (Kubota, 2018). The annual growth rate of the SC market is low

because of the Coronavirus closings, but the industry should bounce back to a higher average growth rate (Linchpin, 2022). According to The Brainy Insights, the global SC market is expected to grow from USD 53.67 Billion in 2021 to USD 152.69 Billion by 2030, at a CAGR of 12.32% during the forecast period 2022-2030. (The Brainy Insights, 2022).

Donnet et al., 2007 and Traore et al., 2018 explain that SC is made from exceptional beans grown only in ideal coffee-producing climates; they tend to feature distinctive flavours shaped by the unique characteristics of the soil that produces them. A holistic appraisal of coffee's qualities, otherwise known in academic literature as attributes, is a better way to assess the "specialness" of a coffee and, therefore, its value in the marketplace (SCA, 2021; Barahona et al., 2020).

Nevertheless, this SC market opportunity is helping very few small farmers due to the way the coffee supply chain is intervened by the intermediaries who have adopted different mechanisms to determine coffee prices: On one hand, Fair Trade adds an extra sum of money on top of the selling price seeking to cover the costs of sustainably producing crop when market prices drop (Fair Trade, 2021). Fair Trade was introduced in 1988 following a coffee crisis (Pierre, 2006). On the other hand, asymmetric benefits between private actors along the coffee value chain led to the participation of new actors who developed new mechanisms such as the Alliance for Coffee Excellence which administers the Cup of Excellence Program born in 1999. These two programs, Fairtrade and Cup of Excellence, try to benefit farmers by paying them better for their high-quality coffee (Gumecindo et al., 2021; Pierre, 2006). Finally, the SCA knowing that farmers are not being paid enough for their product, conducted price formation research called Coffee Price Crisis Response

Initiative (PCR), finding out that coffee price formation is very much like other agricultural products; prices have relied on colonialist structures with many institutions and public policies that play a substantial role in inequality causing: privatisations, price controls, prohibition or regulation, trade policies and many others (Lem, 2022; Piketty, 2014). Rhinehart (2019), head of the PCR and former head of the Specialty Coffee Association (SCA), explains: that coffee is being paid for in countries over USD 3.00 a cup (on average is possible to make 22 cups with one pound of coffee), and most of the folks who farm and grow coffee see less than a dollar per pound. Therefore, farmers have been forced to lay off workers, sell their farms, and encourage their children to abandon the farm and look for more lucrative work elsewhere. Consequently, the PCR intends to provide context for sellers and buyers about recent FOB prices so small farmers can make selling decisions.

All these price mechanisms have failed, as the literature suggests: First, Fairtrade certification and other certifications fail to help the poorest and most needy (Mohan, 2010; Dragusanu et al., 2021). Second, the Cup of Excellence competition only pays good enough for a few selected coffees without recognising differentiated coffees that have not garnered premium but have still been great (Rhinehart, 2019). Finally, the SCA PCR mentions quality and price as the only selling decision factors when the literature accounts for six more factors object of this study (SCA, 2020)

2 PRICE SETTING AND INFORMATION THEORIES

Different theories consider information as a critical factor in price setting: Mwachofi and Al-assaf (2011) argue that the ideal market is a perfectly competitive market where no agent has market power and all sellers and buyers have perfect knowledge

of information. Perfectly competitive markets are informationally efficient, given that prices transmit all relevant information individuals need to make decisions (Grossman and Stiglitz, 1976). Perfectly competitive markets give individuals incentives to share information honestly (Myerson, 2007). In the traditional economic model, players are expected to have perfect information, but this does not occur. This approach in which actors have ideal information has changed (Stigler, 1961), it is well known how George Akerlof (1970), one of the pioneers in this field, examined the consequences of asymmetric information in the price formation of the second-hand car market. Also, there has been considerable development in the economics literature of contract design under asymmetric information over the last twenty years in several fields such as Agri - environmental scheme payments, chain relationships and food quality, most studies conclude that information plays a role in forming prices (Bouchaud et al., 2008). Table 1 is an overview of different authors' substantial contributions to price settings and market information theories

Author	Argument	Consequence
Mwachofi and Al-assaf (2011)	Ideal market is perfectly competitive. Sellers and buyers have perfect information, and complete knowledge	Sellers and buyers are fully rational. No agent has market power
Myerson (2007)	A Perfectly competitive market is informationally efficient	Prices transmit all relevant information that individuals need in order to make their decisions
Stigler (1961)	The identification of Sellers and the discovery of their prices are only one sample of the vast role of the search for information in economic life	Today the economic organization take on a new meaning based on the viewpoint of the search for information

Akerlof (1970)	In asymmetric information environment the "adverse selection" is potentially present	That may cause market failure, due to incomplete information or information asymmetries
Minarelli et al. (2016)	In a traditional economic model, players´ expectancy is to have perfect information	This approach in which actors have perfect information, have changed after Stigler's (1961) paper on the "Economics of Information"
Bouchaud and Lillo (2008)	The information of diverse buyers and sellers to be fully articulated, could be too complex for any of them	Is somehow incorporated into a single number, *the price*.
Fama (1969)	If a market is "informationally efficient"	In such a market, the current price "fully reflects" all available information
Hayek (1945)	An ideal market, it distributes dispersed information to all agents through the price mechanism	In this way the information is distributed, indicating to the agents how to assign resources
Lee et al. (2020)	Letting farmers obtain market price information	Farmers can attempt to negotiate with traders to increase profits
Dieterle (2017)	Rationality enables agents not only the use of all available information but also the use of this information correctly	People are fully informed about their decision alternatives, the probabilities of their outcomes, and their consequences
Mitra et al. (2013)	Under asymmetric information, intermediaries have more accurate information about the prevailing price in the market	Intermediaries would be incentivized to understate this price offering low prices to farmers
Kolb (2008)	If information were free, cognitive limitations will prevent agents from being able to articulate all relevant information into the decision agents make	As a result, some agents will unavoidably have better o more information. Agents will be exposed to asymmetric information
Sachs et al. (2019).	Disclosing reliable and transparent information on the price paid	Could support farmers' bargaining power, giving them an alternative reference point when negotiating on price Information
Wollni and Zeller (2006)	The lack of information	Causes that small SC farmers have no power to negotiate
Kamaruddin et al. (2020)	Price movements. If the world coffee prices increase, it would not necessarily be transmitted to the producer. But, when the world coffee prices decrease, it is quickly followed by the decreased coffee prices of the producers in the market	Agents and private actors at intermediate levels have market power which causes price instability

Stiglitz (2017).	The economics of information has constituted a revolution in economics	Markets where information is imperfect are also typically far from perfectly competitive
Mazzucato (2015).	The relationship between government institutions and small SC farmers is affected by asymmetric information	Such failure can lead to complex principal-agent problems, like market failure
Mazzucato and Semieniuk (2017)	Public investment, along the entire small SC farmers' market chain and across the phases of the business cycle information	Will impact small SC farmers due that they will have access to business information through the new technologies

Table 1. An overview of price setting and market information theories. Source. The author.

3 CONCEPTUAL FRAMEWORK

Asymmetric Information in the Coffee Industry

Following the arguments and consequences shown in table 1, Ferreira et al. (2017) added that small farmers do not benefit from higher prices due to their dependency on intermediaries and the asymmetric distribution of information in favour of other market participants. This occurs when parties involved in a transaction are not equally informed (Minarelli et al., 2016). The informational advantage led to the distortion of market income and, even worse, a total market failure (Li, 2021). Furthermore, the Coffee Price Response Initiative (2019) reported: how the negotiation power and information are consolidated at the trader and roaster levels. Traders, roasters, and the grocery market are increasingly intertwined to sell at higher premiums (Sachs et al., 2019). Subsequently, small SC farmers operate in a market environment strongly affected by information asymmetries, affecting their selling decisions, the price they receive and the profit they generate.

4 LITERATURE REVIEW

Several studies have investigated the small farmer selling decision, considering the different factors that affect this decision. For example, Zúñiga (2007) determined the factors influencing the mango market outlet choice in Costa Rica: method of payment, number of buyers, and distance to market, quality. Ndoro et al. (2015) worked on market selling decisions of cattle in rural South Africa. They determined relevant factors such as price, market channel selection, distance to the auction, and trust in buyers. Goyal (2010) showed that in the central Indian state of Madhya Pradesh, selling decisions of soy products were positively and significantly affected by factors such as price, quality, and market size. Few and diverse studies on the agricultural coffee market, such as Demissie and Diro (2016) and Asefaa et al. (2016), help us better understand the factors influencing smallholders' sales decisions. These studies examined the factors that affect options for exiting the coffee market, including traders' reliability, the market's cost, the optimal price, the lack of other alternatives for leaving to new markets, and payment terms. Also, "Federación Nacional de Cafeteros" (FNC) made studies that mentioned how quality and price are linked but did not mention farmers' decisions (FNC, 2017). Table 2 is an overview of the agriculture products selling decision factors, the X indicates which factors the authors found relevant.

Relevant factors found[1]									
Author	**Data Analysis Technique**	LOM	NOB	TRU	PMB	QRE	PRI	TCL	DEL
(Zúñiga, 2007)	ANOVA analysis/Tobit analysis	X	X		X	X	X		X
(Ndoro et al., 2015)	Multinomial Logit (MNL) model	X	X	X			X	X	X
(Goyal, 2010)	Hotelling's Location Model	X	X			X	X	X	
(Demissie and Diro, 2016)	Multinomial logistic regression model	X					X	X	X
(Diro et. al., 2016)	Statistical Package SPSS version-2.0	X					X	X	X
(Aseffaa et al., 2016)	Multinomial logistic regression model	X	X				X	X	X

Table 2. Research findings about the agriculture products selling decision Factors.

Source. The author

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[1] Factors acronyms: LOM location of the formal and informal markets and cooperatives; NOB the number of buyers at every market; TRU trustworthiness of buyer; PMB method of payment of each buyer; QRE quality sought by each buyer; PRI price paid by each buyer for each quality grade and at different selling points; TCL transport cost of each transporter to different location; DEL distance to each site.

All the studies mentioned above reveal how the distribution of information is asymmetric in agricultural markets. Usually, those with minor information are small farmers among the different players. Despite worldwide studies on the information distribution problem between the various market players, the distribution of market information in the SC sector has been neglected. One study about the Colombian coffee sector by the FNC mentions the farmers' market information needs, however, still, it does not investigate the distribution of market information among SC market players (FNC, 2011). Therefore, we do not know to what degree information is distributed between market players in the SC market in Colombia. So, this research aims to determine the different market information factors that affect small SC farmers' selling decisions.

5 RESEARCH DESIGN

According to the purpose of this research, and given the problem that we intend to investigate, the information asymmetries in the small SC farmers' market, which causes that farmers are being exploited by intermediaries selling their produce in unfavourable place and usually reaching miserable terms. In such a way, we conducted primary research through surveys considering a means of opinion sampling since it involves gathering diverse opinions in the form of responses to research questions.
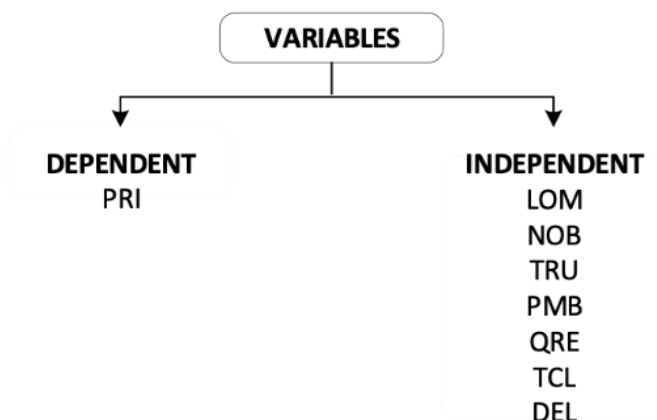
5.1 Materials and methods

5.1.1 Objective of the study

The study aims to identify different market information factors and the information availability of small SC coffee farmers to analyse their marketing challenges.

5.1.2 Variables under investigation

The variables displayed in figure 1 are used in the study for testing, these factors, which are eight have being discussed and chosen from the literature.

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                    ┌─────────────┐
                    │  VARIABLES  │
                    └─────────────┘
              ↓                        ↓
      DEPENDENT                 INDEPENDENT
        PRI                        LOM
                                   NOB
                                   TRU
                                   PMB
                                   QRE
                                   TCL
                                   DEL
```

LOM: Location of different markets	QRE: Quality sought by buyers
NOB: Number of buyers at every location	PRI: Price paid by each buyer
TRU: Credibility and trust of buyers	TCL: Transport cost
PMB: Method of payment each buyer	DEL: Distance to each location

Figure 1. Factors that influence small SC farmers` selling decision. Source. The author

5.1.3 Hypothesis of the study

H0: There is no significant relationship between the independent variables (LOM, NOB, TRU, PMB, QRE, TCL, DEL) and the dependent variable (PRI).

H1; There is a significant relationship between the independent variables (LOM, NOB, TRU, PMB, QRE, TCL, DEL) and the dependent variable (PRI).

5.1.4 Sources

The research is a descriptive study based on a survey to collect the necessary information. In this study, we used both primary and secondary data; preliminary data was collected from small SC farmers who market their products through different intermediaries. The research was carried out in two phases, implementing two questionnaires: Phase 1: Helped to determine the factors that impact the small SC farmers selling decisions and how they used these factors' information. Phase 2: Reveals how much information farmers perceive they have and about the eight variables object of study, the source of information, and whom they perceive has the data, and why it is challenging to get.

6 METHODOLOGY

Figure 2 illustrates the different methodology processes: First, two questionnaires were implemented in two phases. Second, the data analysis included thematic analysis and Pearson's chi-square test. Third, the statistical techniques were spreadsheets and Likert scale data analysis using IBM SPSS. Finally, we got the research results.
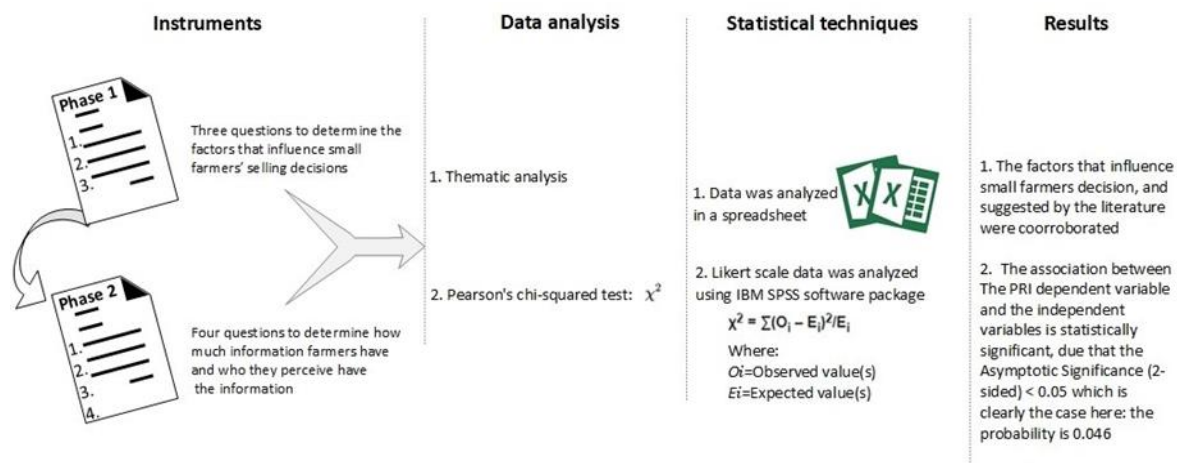

Figure 2. Instruments - data analysis and statistical techniques process. Source. The author

6.1 Data collection

The two-phase study, one after the other, used two questionnaires designed as a tool for data collection and administered through a face-to-face survey. The literature suggests several factors affect small SC farmers' optimal selling decisions. This argument guided us to design two questionnaires to determine the factors that affect small SC farmers' selling decisions. Thus, it was convenient to choose closed-ended and open-ended questions, so respondents had the opportunity themselves, in their own words, to feedback us in a way that we did not anticipate. Accurate representations of personal views revealed the strength of their opinions.

6.2 Sampling design

In this research, we adopted a purposive sampling technique called judgement sampling. It is a deliberate choice of an informant due to the qualities the informant possesses (Tongco, 2007). Hence, the sample chosen was best enabled to answer the research questionnaires, given that information is held by only certain small farm members of the SC community.

6.3 Questionnaire design

The phase one questionnaire has three questions per variable. The first closed-ended question was: How important is knowing the variable table 2 to make your selling decision? Respondents had the choice to select one of four possibilities: not necessary, less critical, meaningful, and highly determining. The second open-ended question was: How do farmers use the information about each variable? The

third question was open-ended: Do you think there are other factors related to the information on the commercialisation of coffee that has not been considered?

Once stage one answers were analysed, the phase two questionnaire was designed. The respondents answered four closed-ended and open-ended questions related to each variable. The first question was closed-ended: How much information do you have about each variable in table 2? Respondents had the choice to select one of four possibilities: 0. means lacking information, 1. means rarely having accurate information, 2. means having some access to information, 3. means having easy access to information. The second question was an open-ended one: What is the information source? The third question was an open-end one: identity, which related information may be helpful to you about each of the variables table 2. The fourth open-ended question was: Who has the information you lack, and why is it difficult for you to obtain it?

7 DATA ANALYSIS AND STATISTICAL TECHNIQUES

7.1 Phase 1

In this phase, thirty-six respondent answers were summarised in three steps, and data collected was stored in a spreadsheet: The first step is related to the importance of each variable; in the second step, we overview all the data being collected variable by variable about how farmers use the information; in the third step, we determine if there is other relevant market information the farmer needs. So, in the end, we could write up a thematic analysis.

7.2 Phase 2

In this phase, sixteen respondent answers were summarised in four steps. The first step consisted of analysing respondent answers using IBM SPSS20 (Statistical Package for Social Sciences), farmers chose one of different Likert Scale categories about how much information they have related to each variable. In the second, third and fourth steps, answers were summarised, and data was stored in a spreadsheet about: farmers' source of information, the valuable information related to each variable farmer may need, and why it is not accessible to them obtaining specific information. So, in the end, we could write up a thematic analysis. Also, we analysed who has the information, such as how farmers perceive it.

8 RESULTS

Planadas Tolima region is the leading coffee producer due to the amount of planted area, employment generated and contribution to exports. Tolima department ranks third with a 12% share of national production, after other departments such as Huila and Antioquia. Sepúlveda et al., 2016 cited by Barahona et al., 2020 mentioned that the sensory attributes of coffee from this region are highly appreciated in international markets. In addition, thanks to the specific geographical conditions, soil type and altitude, the coffee production is demanded by sophisticated markets (Barahona et al., 2020).

Our fieldwork was done with selected participants based on the project that Tolima´s government implemented with Ibagué University during 2017-2021: "Implementing innovation in the post-harvest processes of SC in Tolima" (Bermeo et al., 2021). This project found out that there are 3.787 coffee farmers in the Department of Tolima,

but the best suited for the project´s purpose were 551 SC farmers. In Planadas municipality, where the study takes place, were selected 129 SC.

Then, by adopting the Purposive Sampling technique as a tool for informant selection, in the first stage, we selected thirty-six farmers from the previous 129 farmers mentioned above (Tongco, 2007). In the second stage, we chose sixteen farmers who are community leaders with experience in different technical knowledge. These samples were selected: First, because they are trying to avail the opportunity, they would have by complying with the quality and standards that the SC market demands and the great potential to lead this SC market. Secondly, they were best suitable to answer the questionnaires, given that information is held by only certain members of the SC community. Table 3 displays the socio-categorical respondents` backgrounds in phase 1 and phase 2.

Respondent social factors		
	Phase 1	Phase 2
Age	40 - 71	40 - 71
Gender	Male	Male
Education	Primary	Technical

Table 3. Socio-categorical respondents' background.
Source. The author

The fieldwork was undertaken obeying the project´s chronogram, so information was collected from selected participants in two months between August and October 2019

8.1 Phase 1

8.1.1 Phase 1 step 1

The results about the importance of each variable shown in table 2 are that the thirty-six respondents, every one of them, stated as a questionnaire result that each of the selected factors is highly determining. That confirms the findings of previous studies.

8.1.2 Phase 1 step 2

The results about how farmers used the information were possible with the help of the thematic analysis method applied to the answers the thirty-six respondents gave. Therefore, the reason given by farmers in the use of information is that, without the relevant factors´ knowledge is difficult to improve their business: the LOM, allows new business opportunities to enhance their coffee prices; the NOB, lets establishing new alternative business relationship, avoiding dependence on local markets; about the TRU, farmers expressed they need this information to minimize risk, based on credibility and trust of buyers; about the PMB, farmers said they need this information, to avoid risks, they require timely payment to facilitate the planning of coffee production; about the QRB, farmers expressed they need this information to produce the quality required by specific SC markets; about the PRI, farmers said they need this information because is critical to determine gains; about the TCL, farmers expressed they need this information to establish transport cost; about the DEL, producers require this information to schedule the delivery of the coffee.

8.1.3 Phase 1 step 3

Although we asked if there are any additional factors to consider that they are aware of, the thirty-six farmers surveyed said there are none. For this reason, we did not consider other factors related to coffee marketing information.

8.2 Phase 2

8.2.1 Phase 2 step 1

In the first step, we tabulated 16 respondents' opinions on how much information farmers perceive they have according to the 4-point Likert scale and shown in table 4.

Variables	Frequency opinión on variables				
	Easy access	Some access	Rarely access	Totaly lack	Total
LOM	0	7	7	2	16
NOB	0	3	9	4	16
TRU	0	3	9	4	16
PMB	0	7	8	1	16
QRE	0	5	8	3	16
PRI	0	8	7	1	16
TCL	0	4	11	1	16
DEL	0	4	9	3	16

Table 4. Respondent variables farmers` opinion. Source. The author

So, table 4 is the primary Likert scale data compiled about the availability of information farmers perceive they have. The preliminary Likert scale data was loaded in the IBM SPSS software to find the variable's dependency following statistical techniques:

Statistical Descriptive and chi-squared statistic techniques

The chi-square statistic compares survey respondents' actual responses to questions with expected answers to assess the statistical significance of our hypothesis H1. Faced with the need to use the purposive sampling technique, given that information is held by few members of the SC community, limited data was collected, but enough to be processed with the IBM SPSS software that guided us to consider the Likert scale data as continuous data. Few studies have reported this issue as controversial, but still good practice on condition that is satisfactory data-model fit (Harpe, 2015). David Booth (2020) from Kent State University explains that good research depends on learning the basics and adopting new and better methods as they are developed.

Furthermore, the IBM SPSS software provided the case processing summary table 5, which is the result of confronting the dependent variable price PRI and all independent variable named ALLICA, which is a result of the Likert scale being processed by the SPSS software and it is function of the independent variables LOM, NOB, TRU, PMB, QRE, TCL, DEL.

ALLICA = F (LOM, NOB, TRU, PMB, QRE, PRI, TCL, DEL)

table 5 lets us see that cases have not been excluded.

	Cases					
	Valid		**Missing**		**Total**	
	N	**Percentage**	**N**	**Percentage**	**N**	**Percentage**
PRI * ALLICA	16	100,0%	0	0,0%	16	100,0%

Table 5. Case processing summary. Source. The author

The frequency distributions are shown in table 6; the marginal frequencies are the frequencies reported in the table's margins.

Price *ALLICA Cross tabulation

Count

		ALLICA			
		Total lack of information	Rarely access to information	Some access to information	Total
Price	Total lack of information	1	0	0	1
	Rarely access to information	3	4	0	7
	Some access to information	0	4	4	8
Total		4	8	4	16

Table 6. PRI * ALLICA count cross-tabulation. Source. The author

More importantly, it is said that the association between two variables is statistically significant if Asymptotic Significance (2-sided) < 0.05, which is the case here; see table 7. So, we can rely on our significance test, for which we use Pearson Chi-Square, often referred to as "p" (probability). It is the probability of observing our sample outcome to determine whether there is a statistically significant relationship between the categorical values PRI and ALLICA. In our case is 0.046. Therefore, we can answer our hypothesis test by saying that the importance of PRI depends on the

values of ALLICA. In other words: There is a significant relationship between the independent variables (LOM, NOB, TRU, PMB, QRE, TCL, DEL) and the dependent variable (PRI). Hence, we reject the null hypothesis.

	Value	gl	Asymptotic significance (2-sided)
Pearson Che-Square	9.714[a]	4	0.046
Likelihood ratio	12.620	4	0.013
Linear by- Linear Association	7.895	1	0.005
N valid cases	16		

a. Nine cells (100,0%) have an expected count of less than 5. The minimum due count is .25

Table 7. Chi-Square Tests. Source. The author.

The Bar chart figure 3 displays the Likert scale categories on the x-axis and the frequencies on the y-axis
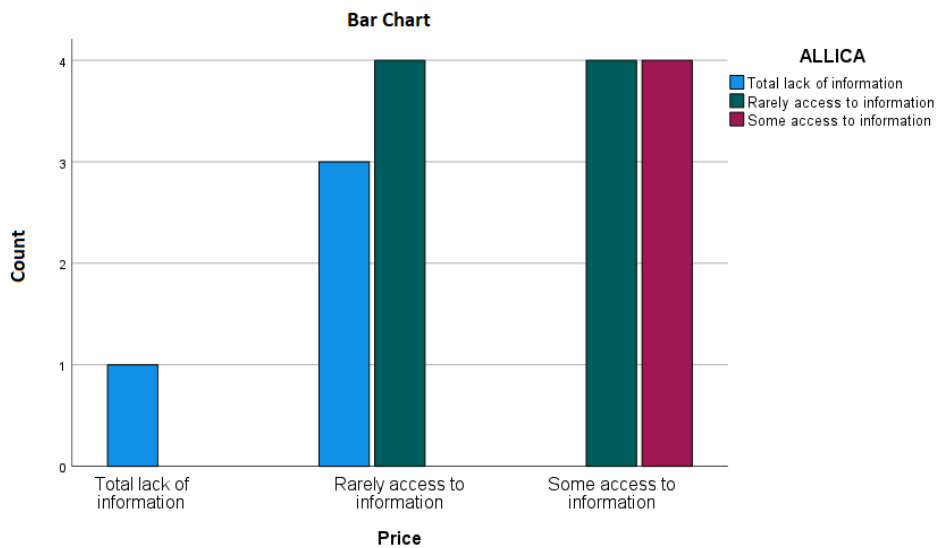
Figure 3. Categories frequencies Bar chart. Source. The author

8.2.2 Phase 2 step 2-3-4

The answer provided by 16 small SC coffee growers about the information sources they have, the valuable information farmers may lack about each variable, and who has the information and why it is challenging to get it, was analysed in a data sheet based on the thematic analysis method:

Information sources

Farmers acquire information with community leaders, extensionists, radio and t. v. They get informed at local fairs about the existence of other market opportunities, but the information shared is not complete, is imperfect.

Lack of related information

Regarding related information about each variable, they said there is a lack of: a market directory, buyer's references, information on commercial-banking and personal, and information on market trends.

Difficulties in getting the information

Among the difficulties in obtaining information is: the cost of getting it; the commercial bias through commercial agreements between intermediaries; the technological means are used poorly; the farmers do not see cooperatives and associations as partners; the farm distance to markets makes even more difficult getting information; intermediaries see information as their business strength and do not share it; the lack of connectivity.

Who has the information?

Finally, table 8 shows what kind of information each actor has, mark with X, in the current business transactions and according to farmers' perceptions and based on

their business experience. The FNC, which handles most of farmers´ business has more information; the "Secretaria de Desarrollo Agropecuario" (SDDA), which assist small SC farmers with quality techniques knows mainly about quality; the "Chamber of Commerce" (CC) from Ibagué which promotes business fair handle some information and about quality, small

farmers think the Ministerio de Transporte (Mintrans) has information about distance and transport costs. Small SC farmers said the private institutions: cooperatives, roasters and buyers handle most information they lack. Finally, who has the least information are small SC farmers.

Who has the information? (farmers perception).								
Factors	**Government institutions**				**Private organisations**			**SC farmers**
	FNC	SDDA	CC	Mintrans	Coope.	Roaster	Buyer	Farmers
LOM	X				X	X	X	About local buyers
NOB	X				X	X	X	About local buyers
TRU	X				X	X	X	About local buyers
PMB	X				X	X	X	About local buyers
QRE	X	X	X		X	X	X	Shared conveniently
PRI	X				X	X	X	Only Partially
TCL	X			X	X	X	X	About local transport
DEL	X			X	X	X	X	About local market

Table 8. Who has the information Source: The author

9 DISCUSSION

This study is the first to analyse how small SC farmers operate in a market environment strongly affected by information asymmetries that influence farmers

selling decisions, the price they receive and the profit they generate. It also refers to several variables studied by researchers affecting agriculture product prices. Price formation is often related to information (Fama, 1970). Wollni and Zeller (2006) explain that farmers are constantly faced with the challenge of making an optimal selling decision due the lack of information, this argument was corroborated with the interviews. Besides that, acquiring information is costly, limited, and usually takes time to be searched (Stigler, 1961); small SC farmer complains they are in a kind of isolation due to the distance where they live and lack of communication. Hayek (1945), cited in Buchanan (2001), explains that the market mechanism can only distribute dispersed information through the price signals, letting agents evaluate information correctly; small SC farmers are unaware of these price signals, data cannot be accessed, is not shared. Hayek (1945) also explained that agent's decision-makers could have the information required to act for their benefit to reach efficient outcomes, but in reality, very few SC farmers reach efficient outcomes as a result of information asymmetries, farmers are the least informed, they are exposed to information asymmetries that cause inadequate transaction benefits. Akerlof (1970) explains how agents make decisions in an asymmetric information market environment, where goods are traded, causing inefficiency results such as sub-optimal market outcomes and hence poor welfare; small SC farmers declare they are not paid good enough.

In brief, small SC farmers argue the need for information to make selling decisions, about each factor suggested by the literature, researchers explain: LOM allows farmers to determine whether to sell the coffee in one market or another, looking the best benefit (Zúñiga, 2007; Demissie and Diro, 2016); nowadays, some farmers on

their own have started to do better business by going to new markets. Knowing the NOB, small SC farmers could choose the best buyer alternative to sell their coffee, achieving an optimal selling decision (Zúñiga, 2007); actually, farmers' new markets experience is limited, this causes adverse selection due the limited local buyer's number to choose a convenient one. The TRU is essential to minimise the payment risk (Demissie and Diro, 2016; Zúñiga, 2007); farmers usually complain about moral hazard they are exposed to. Farmers knowing the PMB, manage the risk payment to keep a healthy business which depends not only on revenue but also on cash flow, it is common for buyers to take advantage of small SC farmers when they face financial constraints (Zúñiga, 2007). The QRB is likely to be highly correlated with the farmers' income; if farmers know market quality that is demanded, they will know where to sell their coffee (Goyal, 2010); farmers are mainly informed about quality which is convenient for the intermediary who gets the most benefits. Knowledge of prevailing prices PRI allows small SC farmers to reap the gains from a broader market search (Goyal, 2010); farmers access price information through FNC, institution which regulate prices based on the New York Stock Exchange (NYSE), then farmers are not informed about other possible offers. The TCL affects coffee commercialization, meaning, who pays the transport cost, the seller or the buyer (Diro et al. 2016; Goyal 2010); farmers only know about local transport cost. The DEL is vital information to plan crop delivery on time (Diro et al. 2016); farmers do not know how to get this information.

In summary, small SC farmers are mainly informed through intermediaries about coffee quality the market demands, and the coffee price that the FNC stablish; farmers do not have access to the rest of the information. Therefore, this information

asymmetries brings market control, so farmers cannot access most of information which causes unfair business transactions. This dissertation took us to establish our hypothesis: There is a significant relationship between the independent variables (LOM, NOB, TRU, PMB, QRE, TCL, DEL) and the dependent variable (PRI).

10 CONCLUSIONS

We have reported field work results, showing that access to selling decision factors positively affects small SC farmer prices. Our analysis suggests it is consistent with small SC farmers` interviews who complain about the need for information to make optimal selling decisions. Local trader offers a lower price to small SC farmers taking advantage of farmers` lack of information, farmers do not have information related to new market opportunities, they stay in the local market doing business as usual. Consequently, intermediaries earn large margins. The lack of information sharing of both formal and informal marketing institutions is causing that the small SC farmer's industry won't be economically sustainable.

The first important finding of this study was confirming the discovery of previous studies: how the factors object of this study is highly determining in small SC farmers selling decisions. Also, by doing a thematic analysis based on small farmer answers, we could realise the importance of each market information factor to make optimal selling decisions. Besides that, the results reported in table 7, chi-square tests, we observe that all independent variables are significant and have a positive effect on the SC price. Afterwards, and using a thematic analysis method, we establish the small farmers' information sources: small farmers get vaguely informed by community leaders and other producers at local fairs and events about the existence

of different marketplaces. In addition, they get notified by radio and tv about prices. The farmers are mainly announced about coffee quality required by intermediaries, FNC, Ibague Chamber of Commerce (CC) and Secretraía de Desarrollo Agropecuario (SDDA). The difficulties in obtaining information are due to the cost of getting it; commercial bias through commercial agreements between intermediaries; technological means are used poorly; there is a market control through information control; institutional bureaucracy does not facilitate information flows; distance and lack of connectivity make information access difficult; intermediaries see information as their business strength, so they do not share it. Therefore, small farmers live in an asymmetric information environment, which causes unfair business transactions. Another essential finding is that farmers perceive information is in the hands of government institutions such as FNC, which has been handling their coffee business for decades, cooperatives, roasters, and buyers who all are seen as intermediaries getting the best part of the business transaction. Finally, farmers explain, the Ministerio de Transporte (Mintransport) have distance and transport cost information which is not good enough structured in the web page.

Theorists suggest that information is dispersed and spread throughout society, but intermediaries still have the privilege of being better informed than small farmers. The market power is concentrated in intermediaries due to the information asymmetries constraining small farmers' participation in high-value markets. Contrary to other researchers, we conclude that we need to consider the eight variables they studied separately to solve the information asymmetries in the small SC industry so farmers can make optimal selling decisions. Small farmers need to know other markets to avoid business as usual. If they know the different buyers in

a market, there will be a better chance of getting the best price for the coffee beans and trusting and payment mode information relieve the risk small farmers could have. Quality is a piece of critical information to deliver what the market requires. If small farmers know transport costs and distance to the market location will allow the decision to sign a final trade agreement taking in account the financial result, and will be possible to deliver the coffee on time.

Finally, small SC farmers face formidable challenges to their economic sustainability owing to the presence of solid asymmetric information. Up to now intermediaries have market power (knowledge), which causes that the price being paid to small producers won`t guarantee their economic sustainability. The study recommends providing market information to small SC farmers to choose appropriate market outlets for efficient and profitable marketing. The government must redirect small farm producers' enterprises, as suggested under the "Entrepreneurial State" (Mazzucato, 2016). Enterprises are not just about setting up a new business (the more common definition); the government must intervene in how small farmers adopt the latest technologies and mainly implement a strategic plan to support small producers, promoting economic sustainability with a broad set of decision-making principles and business practices. Economic growth should be done through multi-stakeholder, participatory, inclusive, and transparent, eliminating information asymmetries to enhance coffee marketing and producers' welfare. Further research is needed to confirm where the information is and if the small farmers' perception is somehow correct and measure the information asymmetry to propose a solution so small SC farmers can make optimal selling decisions.

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