Investigating causes of informal market for fresh meat: The case of Tirana prefecture, Albania

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Abstract

This study is about the level and factors of informality concerning the fresh meat market in the prefecture of Tirana-Albania. Sample data for 200 households have been used to carry out the study. Descriptive statistics, linear and logistic multinomial econometric modeling techniques are used to analyze the data. The level of informality is 34%, while its major factors are the level of price, as well as safety and quality of meat. Other determinants are household's income and consumption quantity and ineffective public monitoring system, while the education of the household's header seems of dubious effect. Important policy implications would be improving the legislation, regulations and the tax system performance. Other recommendations would be improving the rule of law to prevent informal selling and stimulate legal trade. Design and maintain a pro-poor business policy for a positive investment climate encouraging employment and income generation is a priority. Rigorous control of production standards and stimulation of good farming practices as well as improving detection and the use of repressive measures would be some necessities but also tough challenges for the future.

Keywords: *Informality, Fresh meat, Logistic multinomial model, Determinant of informality.*

1. Introduction

1.1 *Background*

The informal economy is carrying out economic activities unauthorized by law, to avoid paying taxes, social security contributions for employed people, and complying with certain regulations. Informal markets are part of the informal economy and they exist parallel with formal markets to meet certain demands of the population. The informal sector overwhelmingly addresses households and micro-enterprises with varying and limited purchasing power.

There is a wide range of reasons why informal markets exist. Sometimes they exist to better satisfy the needs of certain segments of the population, being at the same time a tough challenge for the government to control it. It presents certain risks to the population, such as health and safety risks, in particular in the case of informal food markets.

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Informal economy in Albania is quite high. Speaking in aggregate terms, Albania ranks the 54th country for the average share of the informal economy among 158 countries analyzed for the period 1991-2015 with a weight of 32.7% to the total of GDP. The maximum value was in 1991 with 41.18% of GDP, while the minimum value of the weight of the informal economy was in the year 2011 as much as 25.41% of GDP (Medina and Schneider, 2018). One of the causes of the hidden economic activities for Albania is the large unemployment rate (CRPM *et al*., 2016).

The study focus is on Tirana prefecture. This prefecture is composed of 5 communes (Tirana, Kavaja, Kamza, Vora, Rrogozhina). Tirana is economically and socially the most important region of the country; 30% of Albania's population lives in Tirana, 40% of the national GDP is produced there and 41% of country's active businesses operate in this region.

In this study we shall use an innovative approach; this is the consumers' approach and proxy variables of informality that have been used. Second, as we can see in the methodology section, the approach used is a combination of linear and logistic multinomial models, we have been not able to trace its application in the empirical literature so far. Third, to our best knowledge, it is the first research endeavor focusing on informality for a specific product; and it is among first endeavors in Albania to investigate root causes of informality for a specific economic activity such as food sector.

1.2. *Research problem*

While having an aggregate estimation of the informal economy in Albania, there are not yet estimations for specific sectors, such as the food sector, nonetheless for specific food items, such as fresh meat, or for specific geographic areas, such as Tirana prefecture. Meat is a basic food for the population, and there is a need to know the size of informality in the market of fresh meat and to learn about factors or reasons associated with it. This is the rationale for this study, and information about the above topics would help to better regulate the market, to ensure better tax and safety regulations compliance of businesses or entities involved, to the benefit of both the population and the public budget.

1.3. *Goal and objectives*

Based on the stated need for new information and knowledge, the goal of the research is to investigate about informality and its reasons in the market of fresh meat. Being this so a complex and arduous task, we chose only the prefecture of Tirana as a research focus. Another reason why we focus on Tirana is its dominance in both national production and consumption. Specific objectives are providing a general measure of informality in the fresh meat market for the focus area, and identify some major factors or determinants of it.

1.4. *Review of literature*

The issue of informality in the economic sector has been discussed and is being discussed largely in economic literature. In a narrow context, the informality is meant as "firms and individuals avoiding taxation or other mandated regulations" (Maloney and Saavedra-Chanduvi, 2007). There are monetary reasons for tax avoidance or not paying social security contributions, regulatory, as well as institutional reasons such as corruption law, the quality of political institutions and weak rule of law (Schneider and Buehn, 2016; Medina and Schneider, 2018). According to the International Labor Organization "The informal sector may be broadly characterized as consisting of units engaged in the production of goods or services with the primary objective of generating employment and incomes to the persons concerned. These units typically operate at a low level of organization, with little or no division between labor and capital as factors of production and on a small scale. Labor relations are based mostly on casual employment, kinship or personal and social relations rather than contractual arrangements with formal guarantees." (ILO, 2013).

Various terms, such as "hidden" "shadow", "underground", "informal", "undeclared", "grey", and "unobserved" are to describe the same. The

term "hidden" economy is specifically used mainly to describe economic activities and practices which are legal (non-criminal) as to their nature but remain undeclared to the authorities, whereas "black" economy refers to illegal (criminal) activities and practices (CRPM *et al.*, 2016). But, there is a distinction between the concept of informal economy and that of the informal sector, the former capturing the employment status of individual workers and the latter considering only the nature of business (Zahav and Kelly, 2016).

Food informal sector is characterized by households and micro-enterprises with varying and limited purchasing power (FAO, 2003). Roesel and Grace (2014) make a good description of some characteristics of the food informal markets. One of them is that farmers, traders, and retailers operating in the informal food sector are de facto risk managers. Another crucial trait of these markets from the buyers' point of view is that goods are sold at lower prices, and informal markets are closer and more accessible then formal markets. Trust of consumers in vendors is not a surprise and credit or other services might be quite available in these markets. In addition, products sold may have desired attributes, such as freshness and taste. Another strong point of these markets might be the possibility of selling local breeds, to which a large stake of the consumers might be very keen. Other characteristics of informality in the food sector could be the absence of specialization, very low capital investment, producers being at the same time the consumers of food products and services, the absence of accounts and the non-payment of all or some taxes, and the possibility of complementarities with the formal food sector to satisfy a differing demand. But improper post-processing handling could be a problem in these markets.

However, what is crucial and critical for these markets in the context of our study it is the likelihood of health risks because of pathogens and harmful substances present in the product for sale together with consumers' uncertainty about the application of health and safety regulations (CRPM *et al.*, 2016).

Research has revealed some basic factors of the informal economy. One important factor is unemployment. As Skinner and Haysom (2016) have shown, the informal sector, dominated by informal trade, is an important source of employment, where the sale of food as a significant subsector within this trade. Heavy regulation is another factor of informality. Christie and Holzner (2006) have demonstrated, the high tax burden impact negatively the compliance rates. Further on, more tax evasion will be observed when formal and informal institutions clash (Gërxhani, 2004; Abdixhiku *et al.*, 2018). But, tax evasive behavior of firms is positively influenced by low trust in government and in the judicial system, as well as by higher perceptions of corruption and higher compliance costs, and smaller firms, individual businesses, and firms in sectors that are less visible to the tax administration are more likely to get involved in evasive behavior (Abdixhiku *et al.*, 2017). Whereas Remeikiene and Gaspareniene (2015a, 2015b) found that major determinants of informality include weak enforcement of legislation, inability to protect property rights, high costs of business development and administration, and low probability of detection. According to Schneider *et al.* (2010), other major factors of informality seem to be business freedom, trade openness, and GDP per capita. Otherwise stated, key factors of informality are the rule of law and the quality of institutions.

Other researchers empirically analyzed the willingness to pay for certified beef using showed that income, level of beef consumption, the average price consumers pay for beef and the perception of beef safety are the main determinants of willingness to pay for certified beef (Angulo, Gil, 2007). Well-established labels have positive impacts on the consumers behaviour towards safer products (Pouta *et al*., 2010). But traceability, in the absence of quality verification, is of limited value to individual consumers. Bundling traceability with quality assurances has the potential to influence more the consumers' behaviour (Hobbs *et al.*, 2005). Wu *et al.* (2012), found that the main factors that influence the willingness of consumers to pay a price premium for certified traceable food are income, education, as well as the degree of concern over food safety.

McCluskey and Loureiro (2003) found that the consumer must perceive high eating quality in order to pay a premium for the food product. The perception of quality, and thus the consumer response, depends also on the country or culture that the consumer comes from. Marumo and Mabuza (2018) showed that households' preference for the informal vegetable market were positively influenced by age of the household head, low level of education of adult household members, and convenience provided by informal markets. Wealth status and the perceptions on safety and quality of vegetables were found to have a significant negative influence on participation in the informal market.

Researchers analyse the role to play by, and determinants of contract farming. In our study context, contract farming in relation with meat would significantly strengthen the formal market, thus reducing the size of the informal market (Musabelliu *et al.*, 2019). Some researchers argue that a poor specialised production system and lack of incentives to farmers are factors that encourage sale food product through informal chanels (Belhadia *et al.*, 2014).

1.5. *Research hypotheses*

Based on the research objective and literature findings, the research hypotheses in relation to the fresh meat market are the following:

Hypothesis 1 - Based on the high aggregate level of informality in the Albanian economy, a high level of informality in the fresh meat market is expected also.

Hypothesis 2 - The level of informality is expected to be positively correlated with the amount of meat consumed, level of price the consumer has to pay, and low quality of meat sold in the formal market.

Hypothesis 3 - The level of informality is expected to be negatively correlated with the household's income and consumers' trust in the veterinary stamp or meat safety labeling.

Hypothesis 4 - Education is expected to negatively influence the level of informality or people with a higher level of education to tend to buy informal markets.

Hypothesis 5 - The effectiveness of the meat market monitoring system is expected to be low, contributing to a high level of informality.

2. Material and method

Since (secondary) data on informality for specific economic sectors or regions are thoroughly missing, we use a micro approach, based on households (consumers) primary data collected through surveys. An innovative approach to measure the level of informality in the fresh meat market is proposed. It is a consumers' perspective approach using three alternative proxy variables as indicators of the degree of informality. The first is the household frequency of non-buying meat in licensed meat shops, among other things, buying in the informal market. The second is the household frequency of buying meat with no veterinary stamp or no any safety label. In other words, this means buying in licensed shops which do not comply with safety regulations, or buying in the informal market. If measured on a Likert scale from 0 to 5, the average, or the median, of any of these frequencies can measure the degree of the informality. Being only perceptions, both above measures may not yield identical estimations of the degree of informality, and a linear combination of them could be used as a third variable-indicator of informality. Such a linear combination could serve, for example, their arithmetic average.

Variables included in the analysis to analyze and test the research hypotheses are presented in Table 1.

Data for the above variables is collected through questionnaires for a sample of 200 households from Tirana prefecture; 100 households out of 200 were urban and 100 other were selected from rural area. Households were randomly selected. Table 2 below contains summary statistics for ratio as well as ordinal variables.

The average degree of informality is about 1.7, or 34% in terms of percentage. Half of respondents report an informality less than 1.5,

Table 1 - Variables and their measurement scale.

Variable	*Measurement scale*	*Values*	*Variable*	*Measurement scale*	*Values*
Education (Edu)	Nominal	Low=1, Middle=2, High=3	Safety, perceived as meat free of bacteria, viruses, parasites or chemicals, proxied by trust in veterinary stamp, and/or labels	Ordinal	0 to 5
Family income (Inc)	Ratio	(000) ALL[1] month	Monitoring and control of meat market (Monit)	Ordinal	1 to 5
Informality1= Buying in non licensed shops	Ordinal	0 to 5	Household's consumption (Con)	Ratio	(000) ALL per month
Informality2= Buying meat with no safety stamp or certificate	Ordinal	0 to 5	Price perceived as a hurdle to buy in licensed meat shops (Price)	Dummy	0=Low price 1=Not low price
Informality= Mean of Informality1 and Informality2	Ratio	0 to 5	Quality (lean to fat ratio, visual appearance, smell, firmness, juiciness, tenderness, and flavor)	Dummy	0=No quality 1=Quality

1 ALL=Albanian (Currency), Lek.

Table 2 - Summary Statistics for ordinal and ratio variables.

Variable	*Mean*	*Median*	*St.dev.*	*Minimum*	*Maximum*	*Skewness*	*Kurtosis*
Edu	2.17	2	0.744	1	3	-0.28	-1.15
Inc	48.6	40	17.3	18	70	0.06	-1.13
Con	4.46	4	1.56	2	7	0.53	-0.51
Informality	1.68	1.5	1.37	0	5	0.88	0.48
Safety	3.2	3	1.23	0	5	-0.69	0.37
Price	0.46	1.51	0.81	0.85	-1.28	0.85	-1.28
Quality	0.17	0.00	0.38	0.38	0.38	1.76	1.09

or 30%, though the variation in consumers' responses is considerable (1.23). Similar comments are possible for other variables based on the summary statistics presented in Table 2.

Literature reveals a variety of approaches and methods that can be used to measure the share of the shadow economy in a country. Formally they can be categorized in two groups, direct and indirect approaches. Detailed information about the methods used to estimate the size of the informal economy can be found in (Angulo, Gil, 2007; Lazăr *et al*., 2008; Schneider *et al.*, 2010; Pouta *et al.,* 2010; Schneider and Buehn, 2016; Marumo and Mabuza, 2018).

The research tools used in this study are econometric models (regression model and ordered multinomial logistic model) and non-parametric statistics (Wilcoxon Rank-Sum test and Spearman's rank correlation coefficient).

The general regression model in matrix form is:

$$Y = BX + e \quad (1)$$

Here Y is the dependent variable, X is a vector of independent variables, B is a vector of partial regression coefficients or marginal effects of factors Xi, including also a constant. In our case, the dependent variable is ordinal and some of the independent variables are also ordinal. The classical regression is impossible to use when the dependent variable is ordinal.

Assuming the dependent variable is not ordinal, and following Wooldridge (2013, pp. 226-231; 235-238) two modeling options can be used. First, consider the independent ordinal variables as not being ordinal and estimate the model. Since it is supposed an equal distance (what might be not true) between adjacent categories of an independent variable what we are interested in is only the significance of the parameters and their sign. The second option, each of the ordinal independent variables is represented by a number of dummy variables equal to the number of categories of the variable minus one. For example, the education has three categories, thus we can represent it in the model with two dummies DEdu_2 and DEdu_3. DEdu_2 = 1 if the respondent is in category 2 (middle education) and DEdu_2 = 0 otherwise (low education and high education). The coefficient in front of DEdu_2 indicates the difference in the dependent variables between respondents of the categories 0 and 1 other factor being unchanged.

In this case, the model would look like:

$$Y = c_1 + c_2\,DEdu_2 + c_3 DEdu_3 + e \qquad (2)$$

The unordered multinomial logistic regression model is also used. If the first category of the dependent variable is taken as a reference category, and it has J categories in total, then the general form of the k-factor multinomial model is:

$$P_j = \frac{\exp(a_j + b_{1j}X_1 + \ldots b_{kj}X_k)}{1 + \sum_{i=2}^{J} a_1 + b_{1i}X_1 + \ldots b_{ki}X_k)}, \text{ for } j = 2,3,\ldots J \quad (3)$$

This model gives the probability or the chance of being in the j category for given values of the k factors. Another form of the above model would be:

$$\frac{P_j}{P_1} = \exp(a_j + b_{1j}X_1 + \ldots b_{kj}X_k), \text{ for } j = 2,3,\ldots J \quad (4)$$

This model gives the odds, or relative chances, the ratio of the probability of being in the category j with the probability of being in the base category. The exponentiated coefficients exp(B) are multipliers of odds and indicate how many times increase the odds if a specific independent variable X is increased by one unit, the other X's remaining constant. Odds are increasing if the regression coefficients are >0, one (constant) if the coefficient is zero, and decreasing if the regression coefficients are <0.

A third form of the model could be:

$$\log\left(\frac{P_j}{P_1}\right) = a_j + b_{1j}X_1 + \ldots b_{kj}X_k, \text{ for } j = 2,3,\ldots J \quad (5)$$

The coefficients of this model indicate the percentage by which change the odds if a specific X is increased by one and other factors remain constant. For the model estimation and inference needed to carry out see Osmani and Kambo (2019).

The econometric package GRETL and SPSS have been used to estimate the models. For more technical details about classical descriptive statistics, regression models and multinomial modeling and nonparametric statistics refer to (Wooldridge, 2013; Greene, 2003).

3. Results and discussion

In the beginning, we performed the Wilcoxon Rank-Sum test for the difference between medians of two proposed informality measures, Informality1 and Informality2. The null hypothesis was that the two medians are equal, which resulted statistically valid. Then we calculated the Spearman's rank correlation coefficient (Rho) =0.92, under the null hypothesis of no correlation. This hypothesis resulted invalid. These results support our proposition that each of the variables could be used as substitutes of each other to measure the degree of the informality. Furthermore, the relatively high rank correlation is telling that these variables are not perfect substitutes, which allows us to consider the average of the two variables as a third alternative of measuring the level of informality.

The degree of informality has been calculated in three ways. First, the average frequency of

not buying in the licensed shops was calculated. This average resulted 1.7. Second, the average frequency of buying meat with no veterinary stamp or safety label was calculated. This average resulted 1.65. Ultimately, the average of these two measures was calculated, which resulted 1.675. All these figures are divided by the maximum score of 5, to obtain the measure of the informality. The final results are 0.34, 0.33 and 0.335, respectively.

The average efficiency score of the monitoring system estimated by the consumers is 2.11, based on their perceptions. Compared to the maximum or full efficiency level of 4, this is about 0.53, indicating low efficiency of the system, understood as the capacity of the system to prevent informality in the meat market.

Next, two econometric models are estimated based on Wooldridge suggestions. First, the mean of two informality variables, Informality1 and Informality2, is calculated and named "Informality". Independent variables are driven from the hypotheses to test and are Income (Inc), Consumption (Con), Trust in the veterinary stamp (Safety), Price, Education (Edu) and Quality. Using OLS and taking account of possible heterosckedastic residuals, the estimated model is as in Table 3.

In relation with model 1, a VIF test has been carried out and no collinearity between independent variables was detected (VIF<5); in addition, a chi-square test for normal distribution of the error has been done and no normal distribution of the error has been detected. To correct for non-normality of the error we could estimate an alternative model to model 1 using the square root of "Informality" as a dependent variable. Doing so we estimated the model 2 below.

$$\text{Model 2: SQRT(Informality)} = 1.89^{(***)} + 0.0038\text{Edu} - 0.00316^{(*)}\text{Inc} + 0.023^{(*)}\text{Con} - 0.2698^{(***)}\text{Safety} + 0.2892^{(***)}\text{Quality} + 0.3064^{(***)}\text{Price} + e, \ (R^2=0.736)$$

Testing against null hypothesis that error of this model is normally distributed, we obtained chi-square test statistics = 2.454 and the corresponding p-value = 0.293, which means that the model 2 error is normally distributed. Again, using a VIF test, no collinearity between independent variables in the model 2 was detected.

Comparing models 1 and 2, we would prefer the model 1, for a number of reasons. First, there are no differences between the two models in terms of the direction of relationship between the informality and the independent

Table 3 - Model 1, dependent variable-Informality.

	Coefficient	*Std. Error*	*t-ratio*	*p-value*
const	4.032	0.168	23.970	<0.0001 ***
Inc	−0.005	0.002	−3.876	0.000 ***
Con	0.028	0.020	1.390	0.166
Safety	−0.743	0.009	−83.07	<0.0001 ***
Price	0.335	0.055	6.059	<0.0001 ***
Edu	−0.010	0.047	−0.233	0.815
Quality	0.524	0.186	2.818	0.005 ***
Sum squared residuals	786.290		S.E. of regression	2.018
R-squared	0.977		Adjusted R-squared	0.976
F(6, 193)	1339.179		P-value(F)	0.000
Log-likelihood	−420.688		Akaike criterion	855.377
Schwarz criterion	878.465		S.E. of regression	864.721

Note: (***) means significant at 1% level of significance; (**) means significant at 5% level of significance; (*) means significant at 10% level of significance.

Table 4 - Model 3, dependent variable-Informality

	Coefficient	*Std. Error*	*t-ratio*	*p-value*
const	2.825	0.386	7.323	<0.0001 ***
Inc	0.006	0.003	1.694	0.092 *
Con	0.092	0.030	3.081	0.002 ***
DEdu_2	−0.180	0.156	−1.163	0.246
DEdu_3	−0.403	0.184	−2.196	0.029 **
DBeStamp_2	−1.432	0.385	−3.721	0.000 ***
DBeStamp_3	−1.505	0.358	−4.205	<0.0001 ***
DBeStamp_4	−2.456	0.362	−6.780	<0.0001 ***
DBeStamp_5	−3.248	0.362	−8.982	<0.0001 ***
DPrice	0.330	0.118	2.788	0.006 ***
DQuality	0.676	0.248	2.724	0.007 ***
Sum squared residuals	494.422		S.E. of regression	1.617
R-squared	0.758		Adjusted R-squared	0.745
F(10, 189)	59.116		P-value(F)	0.000
Log-likelihood	−374.295		Akaike criterion	770.590
Schwarz criterion	806.871		Hannan-Quinn	785.273

Note: (***) means significant at 1% level of significance; (**) means significant at 5% level of significance; (*) means significant at 10% level of significance.

variables. Only slight differences exist in relation with significance, since almost the same variables have significant effects on informality except for the consumption which is almost significant in the first model with P = 0.166. In addition, the model 1 has greater predictive power with R^2 = 0.997. Third, model 2 has lesser interpretability of the parameters, the dependent variable been square root transformed. At last, the normality of the model error can be termed as a weak condition, referring to Greene who says "Normality is often viewed as an unnecessary and possibly inappropriate addition to the regression model…" (Greene, 2003, p. 18).

Both models 1 and 2 are significant. Income and consumer trust in veterinary stamp or safety label are also significant and negatively influence the level of informality. Low quality and high price of the formal market affect positively the level of informality, whereas the effect of education is insignificant. Consumption positively influences the degree of informality and it is significant according to model 2 and almost significant according to model 1. The predictive power of the model 1 is excellent because of higher R^2. Both models suffer from not complying with the condition of the equidistant categories of the independent ordinal variables, which may not hold.

Because of this, another model with dummies for the ordinal independent variables has been estimated. The purpose of this model is double. First, it can help to make sure the results of the first model are consistent, and second to escape the supposition of the equidistant categories. The estimated model is the one shown in Table 4.

Model 3 is statistically significant. Using VIF test, no collinearity was detected between explanatory variables in the model (VIF<3). Using a chi-square test, hypothesis on normal error is not accepted.

The effect of all variables is significant, including consumption and high education, but not income (at 5% level of significance) and middle education. Thus, high education people tend to buy in formal markets, but not people with low or middle-level education. The direc-

Table 5 - Model 5: Multinomial Logit model, dependent variable-Informality1, Base category=0.

	Category	*B*	*Std. Err*	*Wald*	*Prob.*	*Sig.*	*Exp(B)*
	Intercept	7.155	2.741	6.811	.009	***	
	Edu	-.516	.667	.600	.439		.597
	Inc	.037	.024	2.370	.124		1.038
1.0	Con	.474	.293	2.613	.100	*	1.606
	Safety	-2.508	.598	17.589	.000	***	.081
	Price	3.434	1.422	5.837	.016	**	31.009
	Quality	1.417	1.377	1.060	.303		4.126
	Intercept	11.494	3.142	13.380	.000	***	
	Edu	.147	.907	.026	.871		1.158
	Inc	.055	.031	3.115	.078	*	1.057
2.0	Con	.465	.364	1.637	.201		1.592
	Safety	-4.751	.740	41.219	.000	***	.009
	Price	8.115	1.687	23.148	.000	***	3342.788
	Quality	2.408	1.582	2.317	.128		11.109
	Intercept	10.065	3.411	8.705	.003	***	
	Edu	.090	1.021	.008	.929		1.095
	Inc	.030	.040	.560	.454		1.030
3.0	Con	1.193	.407	8.616	.003	***	3.298
	Safety	-5.145	.793	42.115	.000	***	.006
	Price	6.302	1.797	12.292	.000	***	545.464
	Quality	-.579	1.869	.096	.757		.560
	Intercept	16.370	4.427	13.673	.000	***	
	Edu	-1.700	1.603	1.125	.289		.183
	Inc	.052	.156	.111	.738		1.053
4.0	Con	.401	1.581	.064	.800		1.493
	Safety	-6.557	1.067	37.748	.000	***	.001
	Price	5.028	2.408	4.361	.037	**	152.676
	Quality	1.301	2.164	.361	.548		3.671
	Intercept	14.663	3.538	17.179	.000	***	
	Edu	-.230	1.083	.045	.832		.795
	Inc	-.094	.051	3.390	.066	*	.910
5.0	Con	1.512	.489	9.548	.002	***	4.535
	Safety	-5.912	.820	51.957	.000	***	.003
	Price	6.066	1.977	9.415	.002	***	430.775
	Quality	3.171	1.828	3.009	.083	*	23.837

Note: (***) means significant at 1% level of significance; (**) means significant at 5% level of significance; (*) means significant at 10% level of significance.

tion of effect is the same as in the first model. This model improves somewhat the first model as far as education consumption is concerned. This model also allows some more detailed analysis of the education levels and various levels of the variable Safety.

Again we can use the square root of the variable informality as a dependent variable. The resulting estimated model is model 4 below.

Model 4: SQRT(Informality) = $1.38^{(***)}$ + 0.00099Inc + $0.0296^{(**)}$Con-$0.461^{(***)}$DBesVule_2-$0.542D^{(***)}$BesVule_3- $0.816^{(***)}$ DBesVule_4-$1.557^{(***)}$DBesVule_5 + 0.046DEdu_2-0.009 DEdu_3 + $0.474Price^{(***)}$ + $0.332Quality^{(***)}$ + e, R^2 = 0.893

The error of the model 4 is normally distributed (Chi-square(2) = 3.592 with p-value 0.16598)

Table 6 - Multinomial model fitting information.

Model	*Model Fitting Criteria*	*Likelihood Ratio Test*		
	-2 Log Likelihood	*Chi-Square*	*df*	*Sig.*
Model with Intercept Only	548.346			
Final model	260.722	287.624	30	.000

and agin no collinearity exists between explanatory variables (VIF<3). For the same reasons as explained above in relatin with models 1 and 2, we preferr model 3 to model 4.

For a more detailed analysis of the effects, a multinomial model form is estimated. Table 5 shows the results of the estimation of the multinomial logistic model, where the dependent variable is Informality1 (buying in non-licensed shops). This model enables revealing differences between various levels of the informality variable because coefficients of the model are different for different levels of consumers' perceptions on the level of informality.

Based on the LR test (see Table 6 below) showing that the LR test P-value <0.05) it results that the model is significant. The model has also good predictive capacity (McFadden $R^2 = 0.473$ and the number of cases "correctly predicted" is 144 or 72.0%).

From the model 5 one can read both significance and direction of the effect for any of the independent variables, for any category of informality and have a general idea of both significance and direction of the effect for each of variables. As we can see, two variables (BeStamp and Price) have a significant effect on informality for any category of informality. The effect of price is negative and the effect of the trust in stamp or label is negative. Education is not significant for any category. The effect of income is negative and significant only for consumers whose perception on informality level is high. Consumption effect is significant for most of the categories (1, 3 and 5) and positive, thus households that consume more meat tend to be more informal. Low quality of meat in the formal market is perceived as having a positive effect on informality only for consumers who rate high the level of informality. From the model, we can calculate chances for the informality to be at a certain level for given values of the factors-independent variables.

Based on the value of the exponentiated coefficients exp(B) it results that price, quality and amount of consumption are the most important factors of informality. The exponentiated coefficients exp(B) indicate the odds for each informality category and each variable compared with the reference category. Thus, if the amount of consumption is increased by one unit (kg) the chances of informality to be in level 1 are 1.6 higher than the chances of being in category 0. The odds can be calculated for every category with respect to any other category, by comparing (dividing) the corresponding exp(B)-s. In realation with consumption, if the amount of meat consumed by the household is increased by 1 kg, then chances of informality to be in category 5 are more than 3 times higher than being in category 4. From the model, we can also calculate the probability of informality, for any category of the informality variable, for given values of factors.

In the end, the effectiveness of monitoring and control of the meat market was investigated. This variable measures the quality of institutions monitoring the market and so may have an effect on the degree of informality. Using data on consumers' perception an average score of 2.11 was calculated for the effectiveness of monitoring (5 being the maximum possible). This means that the system of monitoring has problems and part of the informality may be attributed to this system.

Size of the informal market for fresh meat resulted as expected high, and surprisingly or not it is quite close to the general size of the shadow economy in Albania (32.7% as a mean for the period 1991-2015).

As expected, a major cause of informality in the fresh meat trade is the household's income.

Income has a negative effect on informality because with higher income and other factors being constant the households can afford better buying in the formal market. Stated differently, lower income can be restrictive to buying goods that sell high, such as meat in the formal market, because of limited purchasing power. This role of income is also in line with literature findings (FAO, 2003; Skinner and Haysom, 2016). In other words, better employment which brings home more income would have a negative effect on informality. This role of employment on informality reduction has also been indicated by literature (Schneider and Buehn, 2016).

Another major cause to the high level of informality this research has revealed the consumption of meat. This is in compliance with the research expectations and it is also quite logical because if households want to increase their consumption, with limited income, the only way to meet their demand is buying cheaper in the informal market. This results is also thoroughly in line with the expectations and findings from literature (Angulo and Gil, 2007).

As hypothesized, the level of price to be paid by the consumer works alike; normally prices in the formal market are higher because of higher costs (costs of registration, taxes, costs of compliance with a multitude of regulations, etc.) Thus, if prices are high and at the same time the household income is limited or not increasing, they will want to buy informally because informal markets may sell goods at lower prices. Literature also confirms these results (Angulo and Gil, 2007; Roesel and Grace, 2014).

Low quality of meat sold in the formal market is another cause with negative effect as revealed by this study. It is true enough that actually there is a high public debate about the quality of meat supplied by the formal sellers in Albania. At its center are the use of hormones and inadequate farm practices by local commercial meat producers, or doubtful safety of imported meat. These are good reasons for the buyers to restrain from buying in the licensed shops. Much research underlines the consumers' concerns about food quality, (Hobbs *et al.*, 2005; Marumo and Mabuza, 2018).

Trust in the veterinary stamp and or safety label information, if there is such a label, is another cause as supported by this study, with an increasing effect on informality because consumers appreciate food safety. This result is supported also by literature (McCluskey and Loureiro, 2003; Angulo and Gil, 2007; Roesel and Grace, 2014). Because of their perception of weak public monitoring and regulation enforcement, the households may sometimes think that stamps or labels are forfeited; the consequence of this is buying with more trustable sellers in the informal market based on kinship, friendship or region of provenience-based relationships. Sometimes buying in formal markets is avoided because consumers may want meat from local breeds often found in the informal market (Roesel and Grace, 2014).

Role of education on informality results not enough clear. While in general, no significant effect has resulted, it seems that people with higher education tend to be more formal, which discovers the important role of education. This role of education is also revealed by the literature (Wu *et al.*, 2012).

Effectiveness of the public monitoring and control over the meat market results disastrous. As estimated by the consumers it is about 40% of the maximum possible. This result is in line with the literature, which indicates that low quality of the corresponding institutions and authorities has positive that increasing effects on informality (Remeikiene and Gaspareniene, 2015; Schneider and Buehn, 2016).

Some limitations of this study, however, there are. In its focus is the suburban population of Tirana, thus the generalization for the whole city of Tirana is not possible, nonetheless for Albania as a country. The analysis is based on consumers' perceptions or opinions, which means that some but negligible bias in the results for informality determinants and their effects may exist.

4. Conclusions

The objective of this study is to estimate the level of and identify major factors of informality in the fresh meat trade for the suburban area of Tirana city-Albania. For this purpose data on a sample of 200 hundred of suburban families were

collected. An innovative consumers' perspective approach was used consisting in using two proxy variable for informality and their linear combination, frequency of non-buying in licensed meat shops and frequency of non-buying meat with veterinary stamp and/or safety label. Linear and multinomial logistic models have been used in combination obtain consistent results and amplify the dimensions of the analysis and interpretation.

The degree of informality resulted in 34%, which can be considered high. Factors of informality revealed by the study can be grouped into three categories: household-related causes, market-related causes, and effectiveness of the public institutions monitoring the market. Household-related causes include household's income, the amount of meat consumed and the level of education of the household's header. Market-related causes include price, quality, and safety of the product.

Major causes of high informality in the case of Albania are lack of consumers trust on meat health safety, and then the level of price of meat sold in the informal market. Important causes resulted also the quality of meat and amount of consumption, while the role of education, in general, is not significant.

One of the major causes of informality seems to be the poor quality of institutions and authorities monitoring the market, which have failed to prevent the sale of meat informally.

4.1. *Policy implications*

Safe meat production is the primary precondition to achieve a lower level of informality in the market phase. An effective extension service for farmers, that is a more professional and motivated, together with more funding and better designed government support, would greatly improve the safety of produced meat. In this area, support to farmers to use good farming practices and adequate production technologies, including rigorous control of production standards would be key policy measures.

Lower tax rates for small businesses in particular would stimulate legal meat trade as well, and would be a good measure to reduce the corruption among meat sellers, in this case, and tax administration. Thus, we recommend improvements in this aspect.

As literature highlights, unemployment among urban people is a major cause of informality, because limited income as a determinant of informality is directly related with unemployment. We recommend a pro-poor business-stimulating policy to generate jobs for the poor.

Government agencies should on a regular base distribute information about meat safety among consumers and producers. This will make consumers confident about food quality and safety, stimulating them to buy with formal sellers, while encouraging farmers to produce safer.

Ensure greater stakeholder participation along the meat value chain, by stimulating and organizing meetings and sharing information among them would be another effective way towards safer meat.

Low-educated people, tending more to be informal compared to higher educated ones, need special consideration. Campaigns and information targeted to this category of people, focusing on risks that their families and children in particular run when consuming unsafe meat could work.

4.2. *Scope for further research*

Other studies are needed to investigate other possible factors and their effect on informality rather than those already investigated. In particular, it would be interesting also to investigate in-depth the role of the tax system and the regulatory framework in general, including food legislation. Analysis of the role played by the slaughter-houses network and quality in discouraging informal meat trade would be another interesting research. A similar study from the sellers' perspective would help to complete the cause-and-effect picture of the informality.

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