Geographical Indications and the Value of Reputation – Empirical Evidence for Café de Marcala

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Abstract — **More and more coffee-producing countries establish geographical indications (GIs) for their coffees. GIs are not only considered to be a useful tool for protecting an established reputation against misuse by imitators but also being a useful strategic tool to enter the growing specialty coffee market. Whereas the importance of regional reputation is quite well-documented in the empirical literature on wine, empirical evidence for regional reputational effects on coffee prices is rather scarce. Hence, the objective of the present paper is to shed light on the relevance of regional reputation in the coffee market by representing results for Honduran coffees. A hedonic pricing model based on internet auction data is presented including current quality proxied by a quality score and reputation via regional dummies. The results indicate that up to now the region Marcala, for which a Denomination of Origin was established in 2005, has not yet established such a reputation that after controlling for quality differences higher auction prices are paid for coffees coming from this region.**

Keywords— **geographical indications, reputation, coffee**

I. INTRODUCTION

In recent years a growing product differentiation can be observed in the coffee market. One important feature of this market for differentiated coffees are single-origin coffees or coffees with a geographical indication (GI).[1] This kind of labelling-strategy has got a long history in Europe, especially for wine and cheese, but it is rather new for coffee. GIs are considered to be a valuable tool to "institutionalise reputation", i.e. to protect an established reputation [2].

From the wine market we know that regional reputation is an important price determinant. Several studies have applied the hedonic pricing methodology to examine which wine characteristics are relevant to achieve a price premium [4, 11, 17, 20, 24]. All studies concluded that the region of origin, i.e. the regional reputation influences the price significantly. Landon and Smith [17] even underlined that long term reputation is more important than short term quality movements. Given the fact that in the coffee industry coffee is nowadays often compared to wine the question arises, whether regional reputation is also of significant importance for coffee prices. Do certain coffee regions gain price premiums due to an established reputation? The present paper addresses this research question by presenting empirical results for the case study *Café de Marcala*.

The remainder of the present paper is structured as follows. Section 2 examines very briefly the concept of reputation and its role in the context of GIs. Section 3 provides insights into GIs for coffee, particularly for Honduran coffees. Honduras was chosen as a case study because of two reasons. First, the coffee economy is of economic and social importance in Honduras. It is estimated that about one million people in Honduras are directly and indirectly dependent on the coffee economy and about 8 % of the national GDP and 33 % of the agricultural GDP can be attributed to the coffee sector [13]. Second, Honduras has established a GI for *Café de Marcala* very recently with the

1. According to Lewin et al. [18], differentiated coffees comprise gourmet and specialty coffees, organic, fair trade, and eco-friendly coffees, coffees with certain private or corporate standards and coffees with GIs. Galland et al. [9] define differentiated coffees as coffees that differ in their sensory characteristics, their production method, their marketing conditions and/or their origin from the regular blend.

objective of gaining recognition as a high-quality producer in the main export markets. In order to investigate whether regional reputation is already a significant price determinant for Honduran coffee, a hedonic price analysis is conducted. The model and the results are presented in section 4. Conclusions are drawn in section 5.

II. REPUTATION AND GEOGRAPHICAL INDICATIONS

One important underlying economic rationale for protecting GIs is the economic theory of information and reputation. Since the origin of a product is a credence attribute, consumers are not able to ascertain the desired quality, i.e. the origin, neither prior nor after the purchase. Consequently, consumers have to base their purchase decision on information provided on the product. Trademarks, GIs, and certification schemes are ways to signal the desired information to the consumer in order to overcome the information asymmetry between consumers and producers [2, 23].

Additionally, these distinctive signs "institutionalise" reputation meaning that reputation is protected by the use of legal instruments. Accordingly, a GI has got two fundamental features. First, it functions as a consumer information cue and second, it functions as a producer device to protect its established reputation from usurpation [2, 15].

What is special about GIs compared to trademarks is that they usually protect a collective reputation. A collective reputation can be understood as a function of individual reputations and it is assumed to be a common property resource of a group of firms or producers. The collective reputation a group of producers possesses is thereby a consequence of the group's average past quality, which is in turn a function of past investment in quality [25, 28]. Shapiro [25] also states that in the market equilibrium, high quality products must sell for a price premium above their production costs. This price premium is necessary to cover the costs connected with the establishment and maintenance of the reputation and can be taken as the return on investment in reputation. Looking at this from the consumer point of view, it follows that consumers use reputation to predict current quality and are willing to pay a price premium for products they perceive as high-quality products.

III. REPUTATION IN THE COFFEE MARKET – THE CASE OF CAFÉ DE MARCALA

While the consumption of regular coffee is stagnating in the mature markets in Europe and North America, the specialty coffee segment has grown tremendously in recent years and it is expected to grow even further [18]. This is also true for Japan, which is now the world's third-largest importer of coffee. The Japanese consumers buy a large share of the most expensive coffees such as Jamaica Blue Mountain and Guatemala Antigua. According to the All Japan Coffee Association (AJCA)[2], the differentiated coffee segment is regarded as the segment with the greatest expansion potential in the near future [18]. Given this trend in the main consumer markets, more and more coffee-producing countries establish GIs for their coffees in order to enter this growing niche market.

This does also apply to Honduras. Honduras has currently identified five different coffee-growing regions each having a distinct flavour profile. However, only one region is already registered as a Denominación de Origen Protegida (DO)[3]. *Café de Marcala* is registered since November 2005, being the first DO in Honduras and in Central America [14].

Figure 1: Logo DO Café de Marcala

2. The AJCA was established in 1980 as an organization with the objective to promote coffee consumption in Japan and to contribute to the further growth of the coffee industry [1].
3. In English this term is either translated as "Denomination of Origin" or "Appellation of Origin". However, both terms describe the same type of protection and are interchangeable.

The DO concept includes explicitly the term *terroir*[4] and stresses the fact that the specific product quality or specific product characteristics are essentially due to the geographical environment, i.e. natural and human factors, in which the production takes place. According to the Instituto de Hondureño del Café (IHCAFE), the establishment of this DO is seen as a possibility to create awareness for Honduran coffees in the EU and Japan, the main export markets for Honduran coffee. This awareness-creation as a high-quality producer is necessary, since up to now Honduran coffee has just been used as cheap filler for blends which in turn resulted in low prices paid for Honduran coffee. This assessment is also shared by other actors within the specialty coffee market. The Terroir Coffee Company, a specialty roaster in the United States, states that Honduran coffees share the same quality with coffees from their more famous neighbours Guatemala, Nicaragua and El Salvador, but have not received any special recognition yet [10].

These circumstances, a low reputation and the resulting low prices, have led to the situation that Honduran coffee is smuggled to neighbouring Guatemala to profit from higher prices paid for Guatemalan coffee, which is famous in international markets for its taste and quality [7]. Moreover, it is reported that in recent years the term *Café de Marcala* was misused in such a way that low-quality coffee not being produced in this region was labelled as *Café de Marcala*. This usurpation led to a loss of reputation and consequently to lower coffee prices paid for Genuine *Café de Marcala* [21]. Therefore, the legal protection of the name is considered a necessary step in order to prevent a proceeding deterioration of the established reputation.

IV. METHODOLOGY AND EMPIRICAL EVIDENCE

One possible tool to identify the value of reputation is a hedonic pricing model. A hedonic pricing model relates the observed market price of a good to its characteristics and the partial derivatives of the function with respect to each characteristic represent implicit marginal attribute prices. Algebraically, this can be expressed as

$$P_i = f(Z_{ij}) \tag{1}$$

$$\frac{\delta p_i}{\delta z_{ij}} = \hat{p}_j \tag{2}$$

with p_i representing the market price of good i, z_{ij} measuring the amount of the jth characteristic, $j = 1,..,n$ contained in good i and $\hat{p}_j$ being the estimated implicit price of characteristic j.

Very few hedonic studies have been conducted for coffee so far. Two studies can be found using internet auction data for specialty coffee to investigate the price determinants of specialty coffee [6, 26][5]. Both studies include in their models the present coffee quality proxied by a quality score and the established reputation via country dummies. The results suggest that the main price determinants for specialty coffee are the achieved score, i.e. the current quality, and the ranking in the competition, both having a significant positive influence on the auction price. A significant negative impact could be found for the quantity sold indicating that buyers value limited availability, which can be interpreted as a proxy for exclusiveness. Concerning collective reputation effects at the country level, the results show that Guatemalan coffees have got the highest reputation, since these coffees receive a 95 % price premium compared to Honduran coffees [26]. Moreover, Honduran coffees are discounted compared to all other origins included in the analysis supporting the thesis that Honduran coffees have not yet established a valuable reputation. Similar results are reported by Donnet et al. [6]. Additionally, Teuber [26] estimated hedonic regressions for Colombian and Ethiopian coffee at the regional level. The results indicate that certain coffee-growing regions, e.g. Yirgacheffe in Ethiopia, influence the achieved auction price significantly even after controlling for differences in the present quality by including the achieved cupping score.

4. Terroir is a French term mainly used for wine. The underlying idea of the *terroir* concept is that the quality of an agricultural product is determined by the origin of production. In a narrow sense *terroir* comprises climatic and ecological factors such as soil, precipitation and altitude. In a broader sense it also includes human factors, i. e. traditional skills and know-how [8].

5. What is different to most hedonic price analyses is that these studies use price data at the procurement level and not at the retail level. However, the authors assume that the demand at the procurement level is a derived demand from the retail level.

The present paper differs from the two mentioned above in that way, that a regional approach is adopted and applied to Honduran coffees sold in Cup of Excellence (COE) auctions. Given the recent establishment of the DO for *Café de Marcala* the research question arising in this context is, whether a significant regional reputation impact on the price paid for Honduran specialty coffee can already be identified.

All data originate from the Cup of Excellence website[6]. The procedure of the COE programme is as follows. Any coffee farmer located in the country where the competition takes place can submit a coffee sample. In a first step, a pre-selection of the coffee samples by visual inspection and cupping analysis is done. After this, the pre-screened coffees are cupped by a national jury twice. All coffees get a score ranking from 0 to 100 and only the top coffees scoring 84 and above enter the third stage of the competition. At last, the coffees are cupped by an international jury and the best coffees are awarded the Cup of Excellence®, sometimes called the *Oscar* for coffee.

In a next step these awarded coffees are sold to the highest bidder during an internet auction. Afterwards, all data regarding the coffee farm, its achieved results in the competition and in the online auction are published online.

The dependent variable of the hedonic price analysis is the price the coffee achieved in the internet auction expressed in US-$ per pound. The chosen characteristics representing the set of independent variables comply with the information presented to the bidders in advance available at the COE website.

Descriptions and descriptive statistics of the included independent variables are presented in Table 1. The coffee variety, the coffee growing region and certifications were included as categorical dummy variables. The score and the altitude are both proxies for the general coffee quality, whereas the lot size is a proxy for scarcity and exclusiveness. Unfortunately, some variables like precipitation, soil quality and dummies for different harvest and post-harvest processes could not be included because of missing or inconsistent data.

6. For more detailed information please refer to http://www.cupofexcellence.org

Table 1: Descriptive Statistics of Honduran Coffees sold in COE auctions, 2004-2007.

Variable	Description	Mean	Std. Dev.
Price	Price in US-$ per pound of coffee	3.82	2.79
Score	Score achieved in the cupping competition (ranging from 84 to 100)	87.04	2.63
1st Rank	1 if the coffee was ranked first	0.03	0.18
Lot size	Quantity of coffee sold, expressed in kg	1300	444
Altitude	Altitude in metre above sea level, at which the coffee was grown	1520	145
Farm Size	Farm size in ha	24.90	23.59
Coffee Variety			
Bourbon	1 if Bourbon	0.03	0.16
Catuai	1 if Catuai	0.54	0.50
Caturra	1 if Caturra	0.16	0.37
IHC-90	1 if IHC-90	0.03	0.18
Pacamara	1 if Pacamara	0.03	0.16
Pacas	1 if Pacas	0.14	0.35
Others	1 if other variety	0.06	0.24
Region[a)]			
Agalta Tropical	1 if originating in Agalta Tropical	0.19	0.39
Azul Meambar	1 if originating in Azul Meambar	0.05	0.22
Copán	1 if originating in Copán	0.24	0.42
Montecillos-Marcala	1 if originating in Montecillos-Marcala	0.36	0.48
Opalaca	1 if originating in Opalaca	0.16	0.37
Certification			
Organic	1 if certified organic	0.02	0.13
None	1 if not certified	0.98	0.13
Buyer			
European	1 if bought by a European company	0.20	0.40
Japanese	1 if bought by a Japanese company	0.47	0.50
North American	1 if bought by a N.A. company	0.32	0.47
Auction Year			
2004	1 if sold in the auction 2004	0.18	0.38
2005	1 if sold in the auction 2005	0.34	0.47
2006	1 if sold in the auction 2006	0.28	0.45
2007	1 if sold in the auction 2007	0.20	0.40
Total number of coffees sold		***119***	

Notes: N.A. = North American; Std. Dev. = Standard Deviation; [a)] One shortcoming of the Honduran COE data is that this data just informs about the administrative region the farm is located in but not about the affiliation to one of the five newly defined coffee-growing regions. The IHCAFE website offers two maps with the locations of the awarded farms and the classification into one of the five growing regions. These maps are available for the years 2005 and 2006. Therefore, for the two remaining years, each participating farm had to be allocated to one of the five coffee regions. This was done by using GoogleEarth and a map of the newly-defined coffee-growing regions offered by IHCAFE. The resulting regional dummies are the five coffee-growing regions, namely Azul Meambar, Agalta Tropical, Copán, Montecillos-Marcala, and Opalaca

Source: Own computations

In a first step a simple equality test of the score means was conducted to investigate whether significant differences between coffees from the Montecillos-Marcala and the other regions exist. The results indicate that the mean score of Montecillos-Marcala coffees differs significantly from the score of coffees coming from a Non-Montecillos region (see Annex 1).

After this preliminary analysis a hedonic price regression was estimated. Since the functional form of a hedonic regression cannot be determined *a priori* based on theoretical grounds, finding the appropriate functional form is an empirical task [3]. In order to find the appropriate functional form a RESET-test was conducted for each of the following specifications: linear, linear-log, log-linear and double-log. The RE-

SET-test indicates whether a model is misspecified and, thus, it allows to discriminate between different functional specifications [22]. Based on the test results, the following specification was chosen as the one fitting the data best:

$$\log(p_i) = \alpha + \beta_1 \log(score_i) + \beta_2 1^{st} rank_i + \beta_3 \log(altitude_i) + \beta_4 \log(lotsize_i) + \beta_5 \log(farmsize_i) + \beta_6 varietal_i + \beta_7 origin_i + \beta_8 certification_i + \beta_9 year_i + \varepsilon_i \quad (2)$$

where the subscript *i* stands for the auctioned coffee i, p is the price of the auctioned coffee in US-Dollar per pound and ε is the stochastic error term. The explanatory variables are defined as described in Table 1.

A problem often found in hedonic regressions is multicollinearity, which arises when explanatory variables are nearly linearly correlated with each other [22]. Therefore, the pairwise correlation coefficients between the exogenous variables were calculated and examined. The calculated correlations were all quite low leading to the conclusion that multicollinearity is no severe problem in the data set.[7]

Table 2: OLS Hedonic Regression Results for Honduran Coffees, Reduced Model

Variable	Coefficient	p-Value
Constant	- 46.335***	(0.000)
Log(Score)	10.308***	(0.000)
1st Rank	0.613*	(0.010)
Log(Lot Size)	- 0.442***	(0.000)
Log(Altitude)	0.374*	(0.037)
Year *(Ref. 2004)*		
2005	- 0.350**	(0.004)
2006	0.003	(0.982)
2007	0.420***	(0.000)
Adjusted $\overline{R}^2$	0.82	
F-Statistic	71.73	

Notes: *, **, *** denotes significance at the 5 % -, 1 % - and 0,1 % - level, respectively.

Source: Own presentation.

Two models were estimated, a comprehensive one including all variables under consideration and a reduced one containing only statistically significant variables. The results of the reduced model are presented in Table 2 and the results of the comprehensive one can be found in Annex 2.

The adjusted $\overline{R}^2$ is 0.82 and 0.80, respectively. The *score* and the *lot size* are in both specifications highly significant. If the *score* increases by 1 %, the price increases by 10 % or in other words, a one point increase results in an 11 % price increase. In contrast, the *lot size* has got a negative impact on the price. Since the functional form is double-logarithmic, the estimated coefficient can be interpreted as the price flexibility coefficient[8]. If the quantity offered increases by 1%, the price decreases by around 0.4%. This underlines the assumption that scarcity, which can also be interpreted as exclusiveness, is valued by buyers. Furthermore, it can be concluded from a price flexibility coefficient below unity that the demand for these auctioned specialty coffees is highly price-elastic [27].

The *1st rank* is also significant, but only at the 95 %-level. A coffee that was ranked first in the cupping competition achieved on average an 85 % higher price compared to the lower ranked coffees. The variable *altitude* is only significant at the 95 %-level in the reduced model, in which the *variety* and *regional dummies* are excluded. The reduced model is presented to show that the inclusion of the *variety* and *regional dummies* neither alters the estimated coefficients of the other included variables nor do these variables explain any variance of the achieved price. None of the *variety* or *regional dummy* variables is statistically significant (see Annex 2). Additionally, some models were estimated with the inclusion of coffee-variety groups, i.e. the coffee varieties were included as a categorical dummy with three categories. This approach is based on the statement by Knox and Sheldon Huffaker [16] that traditional varieties, such as bourbon and typica, are often preferred by specialty coffee buyers because of their superior and distinctive taste qualities. Hence, the varieties bourbon and typica as traditional ones constituted the categorical dummy *traditional varie-*

7. The complete correlation matrix is available from the author upon request.

8. The price flexibility is the percentage change in the price of a good associated with a one percent change in quantity, *ceteris paribus* [12].

ties. The modern hybrids caturra, catuai, and IHC-90 were grouped together as the *modern varieties* and the remaining two varieties, pacas and pacamara, constituted the group *other varieties*. These two varieties are not considered to be traditional varieties, nevertheless they are often considered as offering an extraordinary cup quality. But even the grouping into *traditional, modern* and *other varieties* did not lead to any significant results.

A possible explanation for the insignificance of both the *region* and the *variety dummies* could be that these variables are already embodied in the *score* variable and therefore no significant impact of these variables could be found in the hedonic regression. This would be in line with the results from the t-test for equality of mean scores (Annex 2). Therefore, some models were estimated including the *variety* and *regional dummies* but excluding the *score*. Again no significant impact of the region could be detected. These results are in contrast to the findings by Donnet et al. [6] and Teuber [26], which found significant country- and region-of-origin effects even after controlling for quality differences by including the *score* variable and the *origin* dummies jointly. This is not the case for Honduran coffees so far.

As could already be seen from the descriptive statistics, the only certification scheme that can be found for Honduran COE coffees is the organic one. Only two coffees out of 119 were certified organic. The certification has got no statistically significant impact on the achieved price in this data set. The same is true for the location of the company buying the coffee.

Since this is a pooled regression, year dummies were included. The results indicate that significant differences in the general price level can be observed for the years 2005 and 2007 compared to the reference year 2004.

V. CONCLUSIONS

Former studies found that in the coffee market analogue to the wine market reputation at the country level plays a crucial role in determining the price [6, 26]. Coffees from Guatemala achieve high price-premiums due to a well-established reputation, whereas Honduran coffees are discounted to other coffee origins. In order to change this fact, Honduras, particularly the Instituto de Hondureño del Café, identified five different coffee *terroirs* and is trying to establish them in international export markets. In this context the term *Café de Marcala* was protected as a Denomination of Origin in 2005. It seems that coffees offered in the COE auctions coming from this region have got a higher quality reflected by the higher average score these coffees received in the cupping competitions. However, in the hedonic regression no significant regional impacts could be detected after controlling for quality differences by including the score as a current quality proxy. The *score* along with the *1st rank* and the *lot size* are the main price determinants in the hedonic regression. These findings indicate that at the moment Honduran coffee *terroirs* do not yet influence the coffee price directly by a well-established reputation but rather indirectly by offering different coffee qualities.

In this context it is important to point out the limitations of the presented analysis, especially the limitations of the data set used. First, the data set is not a retail data set. Although it is assumed that the demand at the roaster/importer level is a derived demand from the retail level, this point has to be kept in mind while evaluating the results. Moreover, the coffees traded in the COE auctions are very high-quality coffees sold in very limited quantities to coffee experts. The results indicate that in this very specialized segment the region of origin per se is not considered to be a quality cue. This may be totally different looking at "normal" consumers, who are maybe strongly influenced in their purchase decision by region of origin labels such as the DO *Café de Marcala*. These points have to be highlighted in future research addressing GIs and coffee. Another very interesting point for future research is the perception and valuation of origin as a quality cue in the coffee purchase decision in different countries and among different consumer segments. Results from such kind of studies would be very useful in order to give advices in which export markets the GI-strategy seems to be a successful differentiation strategy and in which markets coffee-producing countries should focus on other differentiation strategies such as Utz Kapeh or Organic/Fair Trade Certification.

Moreover, considering the efforts many countries have already undertaken to establish labels of origin for their coffees the fact must be stressed that estab-

lishing a label of origin does not automatically lead to consumer awareness and recognition of the label in the consumer market. Creating a reputation takes time and especially financial expenditures. It is not enough to protect the term *Café de Marcala*, it is even more important that coffee drinkers recognize this name and connect a special quality with it. On the other side, the internet auctions for specialty coffee have helped to make buyers aware of the different coffee origins and have fuelled the growth of this niche market. According to a McKinsey study assessing the participation of Nicaragua in the COE competition, Nicaragua could expand its specialty coffee exports as share of total coffee exports from 2 % in 2001 to 15 % in 2005. Furthermore, the COE has been an incentive for quality improvements and has greatly enhanced the reputation of Nicaraguan coffee [19]. The same may be true for Honduras.

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ANNEX

Annex 1: Result of the t-test for Equality of Means of Score between Montecillos Coffee and Non-Montecillos Coffee

Test for Equality of Means of SCORE			
Categorized by values of MONTECILLOS			
Included observations: 117			
Method	df	Value	Prob.
t-test	115	2.395107	0.0182
Anova F-statistic	(1, 115)	5.736537	0.0182

Annex 2: OLS Regression Results for Honduran Coffees, Comprehensive Model

Dependent Variable	**Log(price)**	
Variable	**Coefficient**	**p-Value**
Log(Score)	10.738***	(0.000)
1st Rank	0.589*	(0.046)
Log(Lot Size)	-0.431***	(0.000)
Log(Altitude)	0.378	(0.103)
Log(Farm size)	-0.006	(0.843)
Variety *(Ref. Bourbon)*		
Catuai	0.068	(0.668)
Caturra	0.096	(0.563)
IHC-90	-0.143	(0.418)
Pacamara	0.088	(0.639)
Pacas	0.101	(0.561)
Others	0.063	(0.741)
Regions *(Ref. Marcala)*		
Agalta Tropical	0.052	(0.528)
Azul Meambar	0.004	(0.977)
Copán	0.001	(0.986)
Opalaca	0.086	(0.362)
Certification *(Ref. None)*		
Organic	0.109	(0.626)
Buyer *(Ref. Japanese)*		
European Company	0.046	(0.542)
NA Company	0.019	(0.736)
Year *(Ref. 2004)*		
2005	-0.344**	(0.008)
2006	0.007	(0.951)
2007	0.453***	(0.000)
Adjusted R squared	0.80	
F-Statistic	22.07	
Number of observations	112	

Notes: *, **, *** denotes significance at the 5 % -, 1 % - and 0,1 % - level, respectively; NA = North American

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