RESEARCH ARTICLE

OPEN ACCESS

Sustainability labels in the Spanish coffee market: A hedonic price approach

Nesrine MERBAH[1*] and Sonia BENITO-HERNÁNDEZ[2]

[1]*Universidad Politécnica de Madrid. E.T.S. de Ingenieria Agronomica, Alimentaria y de Biosistemas. 28040 Madrid, Spain.*
[2]*Universidad Politécnica de Madrid. Department of Agrarian Economics, Statistics and Business Management, 28040 Madrid, Spain.*

Correspondence should be addressed to Nesrine Merbah: nesrine.merbah@gmail.com

Abstract

Aim of study: Focused on the coffee sector, the purpose of this paper was to determine the implicit price paid for the main sustainability certifications (Fairtrade, Organic, Rainforest Alliance and UTZ certifications) using the hedonic price approach.

Area of study: Spain.

Material and methods: The total sample included 645 coffees. The characteristics were collected between the months of September and October 2021 from coffee packs sold in the main five supermarkets of retail chains in Spain. A log-log price/attribute function was used to estimate the hedonic price function.

Main results: The attributes UTZ certification, origin, and coffee intensity received significant positive effects leading to higher premium prices of 28.51%, 25.50% and 26.50%, respectively. In contrast, Fairtrade certifications had a negative impact on the average price of coffee.

Research highlights: The proposed model could be considered as a first approximation of a hedonic pricing model estimation for sustainable coffee in Spain. The results provide useful information for the coffee sector in developing effective marketing strategies that support the sustainability of food.

Introduction

In addition to price and quality, consumers have become more interested in the environmental and ethical conditions associated with the production of what they consume, which helps in achieving more balance between their consumption and a sustainable healthy lifestyle. Sustainable food has become an important aspect of the food industry, driving manufacturers to differentiate their products through certification, messaging, labelling, and many other strategies that report on product sustainability. Simultaneously, consumers have consistently shown that they are willing to pay an additional price for products that are labelled as sustainable (Van Loo et al., 2015; Janßen & Langen, 2017). Sustainability labelling responds to consumer concerns, increases the value of the product, enhances competitiveness and secures the value chain operation (Erraach et al., 2017).

Coffee is considered as among the most consumed drinks in the world. In 2020/2021, coffee consumption in European Union countries accounted for 33% of global consumption (CBI, 2021b). According to the International Coffee Organization (ICO, 2020), Spain is one of the main twenty most coffee-consuming countries in the world. Nowadays, an increasing number of people are consuming coffee, and are increasingly conscious about their consumption taking into consideration various aspects of

its production process, whether environmental, ethical, or social.

Over the years, the voluntary standards systems have evolved into a credit tool for monitoring unsustainable behaviour and ensuring the improvement of the coffee supply chain (Panhuysen & Pierrot, 2014). The certified coffee farming follows certain guidelines considering at least one of the sustainability criteria: economic, environmental, and/or social. It also requires a verification by an independent certification body (Bozzola et al., 2021). This independent third-party confirmation of the status is "conducted by an accredited auditor. Typically, certifications must be renewed annually and are designed to protect both buyers and suppliers" (Bozzola et al., 2021). Thus, compared to conventional coffee farming, sustainable coffee farming is more efficient and profitable (Kharel & Adhikari, 2021). Meanwhile, the coffee is marketed with a label indicating that it has been produced under certain sustainability guidelines (Lentijo & Hostetler, 2011). This contributes to better marketing opportunities because of a specific market demand for certified goods (Bozzola et al., 2021).

The Fairtrade, Organic, Rainforest Alliance and UTZ certifications are the most prevalent third-party sustainability schemes widely used in the coffee market and are among the third-party sustainability certification schemes (Panhuysen & Pierrot, 2020). Additionally, there are other verification schemes that are private sector standards (not certifications), such as Starbucks C.A.F.E. Practices and Nespresso's AAA Guidelines, as well as 4C (the Common Code for the Coffee Community), a business-to-business initiative (Kolk, 2013).

The coffee industry is recognised a successful example for other commodities implementing sustainability certifications, which are seen as credible attributes by consumers and an important tool for marketing and differentiating products (Reinecke et al., 2012). Under Fairtrade certification, farmers and labourers are supported to improve their lives and communities while promoting sustainable behaviour in coffee farming (Lentijo & Hostetler, 2011). Moreover, Fairtrade certification guarantees a minimum price for the coffee produced (Cole & Brown, 2014) who believed in the economic advantages brought by the Fair Trade since it empowers growers and drive sustainable development. However, Giuliano points out that the Fair-Trade Labeling Organization (FLO.The fairtrade label is considered the most well-known ethical label among consumers.

Vigar et al. (2020) in a systematic review report that organic consumption is associated with reducing incidence of certain diseases compared to conventional food. Organic certification aims to preserve people's health, soil, and ecosystems. This certification ensures that coffee is cultivated without synthetic fertilizers, and that sustainable methods and practices are used to protect the plants and preserve the soil (Ecocert, 2021).

Coffee produced under Rainforest Alliance (2020) certification respects a set of principles of sustainable agriculture by promoting climate-friendly farming practises and preserving natural sources, as well as socially responsible measures.

The UTZ certification, founded in 2003, assures coffee production with the use of sustainable fertilisers, pesticides, water, and energy. Workers are treated respectfully by providing them with good life conditions such as proper labour rights, housing, and healthcare. In July 2020, UTZ certification and Rainforest Alliance have been merged, and the UTZ certification refers to the Rainforest Alliance certification (Rainforest Alliance, 2021b).

Even though sustainably certified coffee accounts for 55% of total global coffee production (Panhuysen & Pierrot, 2020), the market share of sustainably certified coffee reached just 8% of exported coffee in 2009; 12% in 2012 (Potts et al., 2017); and about 26% in 2019 (Panhuysen & Pierrot, 2020).

The market share of certified coffee varies among countries with particular requirements for each certification system. According to CBI (the Centre for Promotion of Imports from developing countries, an agency of the Ministry of Foreign Affairs of the Netherlands), Europe is regarded as the most important market for certified coffee in the world. Organic and Fairtrade certifications are the most famous certifications among consumers over the world. Organic coffee is considered prevailing within Germany, France, Belgium, Denmark, and Sweden. However, Fairtrade coffee is widespread in the UK, Germany, and Switzerland, and its markets are growing rapidly in Ireland, Finland, and Denmark. Rainforest-certified coffee overwhelms in the UK, Germany, the Netherlands, and France. While UTZ-certified coffee is overwhelming in the Netherlands, Germany, Italy, Switzerland, and the Nordic market (CBI, 2021a).

Due to "the difficult requirements such as record keeping, traceability and good agricultural practices that are commonly shared among the different certifications" (Pierrot et al., 2011), as well as to the proliferation of sustainability certification schemes among both coffee companies and consumers, producers are moving towards adopting multiple certifications for their products to secure or maintain market access. Hence, various sustainability labels are often found on the same coffee pack (Consumers International, 2005).

In 2017, about 43% of UTZ certified coffee was certified for one or more other schemes (11% Fairtrade, 28% Rainforest, and 18% Organic) (UTZ, 2017). Similarly, in 2020, 40% of the Rainforest Alliance producer groups/individual farms were certified to one or more other standards (28% UTZ, 18% Organic, 14% Fairtrade, 16% other) (Rainforest Alliance, 2021a).

When it comes to influencing purchase decisions and determining the relationship between the consumer and retailer, price is one of the most significant variables (Angulo et al., 2000). Moreover, it was hypothesized that individual consumers assess a product's quality based on a set of

Table 1. Data description characteristics.

Characteristics	Levels	Observations (%)
Price		Continuous (€/kg)
Quantity		Continuous (g)
Retail chain	Hypermarket (Carrefour)	36.07
	Neighbourhood (Mercadona + Eroski)	47.06
	Discount (DIA + Lidl)	16.87
Brand	Leader	81.33
	Private	18.67
Sustainability labels	Fairtrade	2.17
	Organic	5.57
	Rainforest	2.48
	UTZ certified	20.59
Intensity		64.65
Origin		27.29

Samples[1]	Observations (%)	Minimum price (€/kg)	Maximum price (€/kg)	Average price (€/kg)	SD
Total sample	645 (100)	0.99	16.9	33.90	23.63
50-150 g	323 (50.08)	18.5	138.33	52.08	17.24
150-250 g	72(11.16)	9.60	63.68	28.75	15.75
250-350 g	171(26.51)	3.96	65.19	13.36	9.03
350-550 g	63 (9.77)	4.10	23.98	9.28	4.37
550-1050 g	16 (2.48)	4.49	12.99	6.51	2.46

[1] Average weight of coffee in the sample, 202.14 g. Source: Own elaboration.

characteristics that offer them a certain utility (Schamel & Anderson, 2003). According to Lancaster's (1966) theory, consumers do not derive their utility directly from the goods they consume, but from the combination of characteristics that the goods possess. Rosen's (1974) approach allows for the determination of the implicit price for each of these characteristics. The link between the price and attributes of the product is one of the hedonic price index model cases, in which the price of a product depends on its characteristics.

In this research field, the hedonic price method appears to be promising for estimating the implicit value of coffee's sustainability attributes. Based on this framework, the main objective of this study is to estimate the implicit price of sustainability labels found on the coffee packages, sold in the Spanish market, with an emphasis on third-party sustainability schemes. Specifically, the research question in the present study is to investigate: What is the current situation of sustainable coffee in the Spanish market?

Material and methods

The hedonic pricing approach has been used in numerous applications in the Agri-food industry. Here are some examples: saffron (Sanjuán-López et al., 2009), olive oil (Cavallo et al., 2018; Ballco & Gracia, 2020), wine (Angulo et al., 2000; Galati et al., 2017), and yoghurt (Carlucci, 2013; Ballco & De-Magistris, 2018).

The attributes in this study were selected after conducting a literature review with consideration of the specific characteristics of sustainable coffee. Indeed, coffee, like wine and olive oil, is a highly differentiated product where attributes (both intrinsic and extrinsic) determine the final price. In the economic literature, few studies aimed to evaluate the implicit price by using hedonic models have focused on certified coffee. Recent studies include Bosbach & Maietta (2019), who estimated the price premium of Fairtrade labels in the Italian market, and Wang (2016) who found that the fair trade labels increased prices in the US market.

In the empirical application of hedonic price functions in the Agri-food sector, data have been collected in different ways, e.g., purchases reported in questionnaires addressed to consumers (Gracia Royo & Pérez y Pérez, 2004) or from product labels in points of sale (Karipidis et al., 2005). This study follows (Sanjuán-López et al., 2009; Ballco & De-Magistris, 2018; Ballco & Gracia, 2020) and collects data from online shopping websites.

Data were collected from the main retailers in Spain. To guarantee the representativeness of the sample, fieldwork was conducted in September and October 2021. A total of

Table 2. Description of variables used in the estimation of the hedonic price function.

Attribute category	Attribute level	Value
Price		Continuous variable (€/kg)
Quantity		Continuous variable (g)
Retail channel	Hypermarket	Takes 1 if the coffee is sold in the Hypermarket
		0 otherwise
	Neighbourhood	Takes 1 if the coffee is sold in the Neighborhood
		0 otherwise
	Discount	Takes 1 if the coffee is sold in the Discount
		0 otherwise
Brand	Leader	Takes 1 if the coffee is a leader brand
		0 if the private brand (supermarket brand)
Sustainability labels	Fairtrade	Takes 1 if the coffee is labelled Fairtrade
		0 otherwise
	Organic	Takes 1 if the coffee is labelled organic
		0 otherwise
	Rainforest	Takes 1 if the coffee is labelled Rainforest
		0 otherwise
	UTZ Certification	Takes 1 if the coffee is labelled UTZ
		0 otherwise
Intensity		Takes 1 if the intensity is indicated
		0 otherwise
Origin		Takes 1 if the origin is indicated
		0 otherwise

Source: Own elaboration.

5 supermarkets were visited. They belong to Spain's five main retail chains and account for 50.6% of the supermarket market share: Mercadona, 24.8%; Carrefour, 9.2%; Lidl, 6.8%; DIA Group, 5.1%; and Eroski Group, 4.7% (Kantar, 2021).

A total of 645 coffee packs were examined at the five supermarkets, where the main characteristic is their selling price as dependent variable. As indicated in Table 1, the database also recorded the following information: quantity, retail chain, brand, sustainability label, intensity and origin that were included in the hedonic price model as explanatory variables.

The dataset included references from 43 different brands. Five of them carried the brands of the distribution channels and accounted for 14.09% of the total observations. The remaining 85.91% were the retailers' brands. Carrefour and Eroski shared more than 70% of the total number of references, followed by DIA and Mercadona, with about 11% each Lidl, on the other hand, had a much lower number of references (5.87%).

As far as the sustainability labels are concerned, UTZ certification was present in 20.2% of the total observations, followed by organic (5.58%), rainforest (2.48%) and fairtrade certification (2.17%). Considering the relationship between sustainability and retail chains, about 29.15% of the observed coffee packs carried a sustainability label.

About 40.42% of Carrefour's retailer coffees carried a sustainability label; DIA, 12.23%; Mercadona, 2.13%; Eroski, 32.45%; and Lidl, 12.76%. The remaining 70.85% of the observations were not certified for sustainability. As for the attribute origin of the coffee, 27.29% of the coffee was marketed indicating the country of origin, while 64.65% indicated the intensity of the coffee.

The price of coffee ranged from a minimum of €0.99 to a maximum of €16.95 depending on the quantity of the pack, with an average price of €33.90/kg. The quantity content varied from a minimum of 50 g to a maximum of 1000 g, with an average weight of 202.14 g. The most common size found was 50–150 g (50.08%), followed by 250–350 g (26.51%), and containers of 150–250 g (11.16%).

Hedonic price theory assumes that goods are heterogeneous or differentiated and that each possible bundle of characteristics defines various qualities. Each coffee product consists of a set of characteristics for which consumers are assumed to have preferences. The model decomposes these characteristics that influence price and assigns them separate values P. Rosen's (1974) hedonic price function expresses the price of a variety as a function, where the vector represents the product's features under study:

Table 3. Ramsey's regression specification error test for linearity.

Functional form	F-statistic	p-value	Test result
Lin-Lin	437.870	0.000	Rejected
Lin-Log	87.271	0.000	Rejected
Log-Lin	301.930	0.000	Rejected
Log-Log	0.081	0.776	Accepted

$$P = f(z) \tag{1}$$

This hedonic price equation represents the equilibrium between suppliers and consumers in which suppliers are willing to sell (minimum price), and consumers are ready to pay for an additional attribute (maximum price). Assuming that preferences for the differentiated product are defined in terms of the product's characteristics, the consumer's utility function is presented as follows:

$$U = U(x, z) \tag{2}$$

$$Y = wx + f(z) \tag{3}$$

where Y is the income of the consumer, x is a vector of homogeneous goods representing all goods except the product examined, and w is its price. The consumer opts for the optimal number of characteristics of coffee to maximise his utility (subject to a budget) until the implicit marginal price level equals his/her willingness to pay for the attributes. In this study, the characteristics of the coffee (z_{kj}) in the market are presented in Table 2.

$$f_j = U_j(x, z)/\lambda(x, z) = g(y - P, z) \tag{4}$$

where $f_j = \partial f/\partial z\_j$; $U\_j = \partial U/\partial z\_i$; and λ is the Lagrange multiplier.

The linear specification can be considered:

$$P_k = \beta_0 + \sum_{j=1}^{m} \beta_j z_{kj} + \varepsilon_k \tag{5}$$

where β_j are the parameters to estimate the implicit prices or the willingness to pay. In the empirical literature, the hedonic price model has been estimated with different functional forms: linear (lin-lin), semi-logarithmic (log-lin), logarithmic (lin-log), and double-logarithmic (log-log).

Economic theory does not specify which functional form of the hedonic price equation is most appropriate. Therefore, to select the functional form that fits best the data, the researcher must make an empirical decision. In this paper case, following the literature of Schamel & Anderson (2019), the appropriate functional form is selected by applying the Ramsey (1969)'s RESET (Regression Equation Specification Error Test). Additionally, the Jarque Bera test (a diagnostic test used to assess normality - Thadewald & Büning, 2004), was performed.

There has been considerable studies on the influence of coffee attributes, especially sustainability labels, on price, due to the significant differentiation of this product (Maietta, 2005; Van Loo et al., 2015; Wang, 2016; Bosbach & Maietta, 2019; Lingnau et al., 2019). In our study, the price was measured in euros per kilogram and introduced as dependent continuous variable. Additionally, the quantity of coffee was measured in grams and introduced as continuous independent variable. Further, we included other explanatory variables (retail chain, brand, sustainability labels, intensity, and origin) as independent dummy variables. Table 2 shows the values of the variables used in the estimation of the hedonic price function.

Results

In the first step, the linear (lin-lin), logarithmic (lin-log), semi-logarithmic (log-lin) and double-logarithmic (log-log) models were employed with the RESET to verify the model's linearity. Table 3 contains the results showing that three possible functional forms are rejected: lin-lin, log-lin and lin-log models ($p < 0.000$). That is, we rejected the null hypothesis of no misspecification or missing variable bias. However, with a statistical value of 0.025 and a p-value of 0.873, the Ramsey RESET suggests that

Table 4. Jarque-Bera test for normality of residuals.

Functional form	F-statistic	p-value	Test result
Lin-Lin	116.800	0.000	Rejected
Lin-Log	902.680	0.000	Rejected
Log-Lin	9.395	0.009	Rejected
Log-Log	2.635	0.268	Accepted

Source: Own elaboration.

Table 5. Parameters estimates of the price hedonic equation.

Variable	Coefficient	Std. Error	p-value	Marginal effect (%)
Constant	6.846	0.145	0.000***	
Quantity	-0.838	0.024	0.000***	
Brand	0.349	0.048	0.000***	41.76
Retail chain				
Hypermarket	0.102	0.054	0.058*	10.73
Neighborhood	0.024	0.053	0.656	2.39
Sustainability labels				
Fairtrade	-0.320	0.105	0.003***	-27.38
Rainforest	-0.029	0.101	0.777	-2.83
UTZ	0.251	0.041	0.000***	28.51
Organic	0.251	0.098	0.010***	28.50
Origin	0.084	0.034	0.014***	8.78
Intensity	0.235	0.043	0.000***	26.50
R²	0.7784			
R² adjusted	0.7749			
F_test	222.7 (0.000)			

[1] ***,**,*: significant at 1%, 5%and 10% level, respectively. Source: Own elaboration.

the double log model may be correctly specified (the null hypothesis of correct/linear specification was not rejected at the 5% significance level).

Since the RESET could lead to inconclusive results, we also applied the Jarque Bera test to finally select the adequate functional form (Table 4). With a statistical p-value of 0.000, the Jarque Bera test reveals that the residuals of the linear (lin-lin), logarithmic (lin-log) and semi-logarithmic (log-lin) models were not normally distributed and hence the models were not correctly specified. The Jarque Bera test findings showed once more that the double logarithmic (log-log) functional form was suitable. The Jarque-Bera test, with a statistical value of 3.520 and a p-value of about 0.172 indicated that the model's residuals were normally distributed; hence, the model was considered to be correctly specified. That is, the Jarque-Bera test demonstrated sufficient normality of the residuals. Accordingly, both the price and quantity variables were converted to logarithms and the double logarithmic model was estimated as follows:

$$Ln(Price) = Constant + \beta_1.Ln(Quantity) + \beta_2.(Brand) +$$
$$\beta_3.(Hypermarket) + \beta_4.(Neighborhood) + \beta_5.(Discount) + \quad (6)$$
$$\beta_6.(Fairtrade) + \beta_7.(Rainforest) + \beta_8(UTZ) + \beta_9.(Organic) +$$
$$\beta_{10}.(Intensity) + \beta_{11}.(Origin) + \varepsilon_i$$

Moreover, to check the adequacy of the model, first, the variance inflation factor (VIF) was used to determine whether there was a correlation between the variables. The VIF of these indices was less than 5 for each covariate, then, we could conclude that there is no problem with multicollinearity. In addition, to test the heteroscedasticity of errors in regression, the Breusch-Pagan-Godfrey test was applied, where the null hypothesis of homoscedasticity of the error term was rejected (probability F-statistic 0.000), indicating homoscedasticity problems. To address this issue, White's robust estimation strategy was applied to determine the standard errors of the parameters that could conduct to problematic inference on the significance of parameters.

The observations from Table 5 show that the regression fit was quite high; the adjusted R-squared had a value of 77.84% with a significant F-value. This means that 77.49% of the log-price variation could be explained by the explanatory variables.

The quantity of coffee negatively impacted the price, with a coefficient of -0.838. Since price and quantity are expressed in logarithms, the estimated coefficient could be interpreted as elasticity. Thus, a 1% increase in coffee quantity results in a -0.838% decrease in price. This is an expected result since a unit price discount is normally given when a larger quantity of a product is purchased. In addition, previous hedonic price studies have confirmed an inverse relationship between product price and package size (Parcell & Schroeder, 2007; Ward et al., 2008). The remaining independent variables in the hedonic price model were introduced as dummy variables. Since the functional form was double, the coefficient for the dummy variable could be interpreted as price variation according to the following procedure (Halvorsen & Palmquist, 1980):

$$\Delta P/P = \left(e^{coefficient} - 1 \right) * 100 \quad (7)$$

The different retail channels for coffee were not statistically significant. Therefore, premium prices were not associated with them. About the two brand types, the results

showed a positive impact for the leader brand compared to the private one (supermarket brand), which received a percentage premium of +41.76% and additional implicit prices of +1.73 €/kg. This result may be explained by the fact that leading brands enter the market with new ideas and products and incur research and development costs that are recouped via sales. All these elements contribute to building the brand loyalty and justify the higher price as well.

Regarding sustainability labels, organic certification and UTZ certification were important sustainability attributes that affect the price of coffee. Both organic and UTZ certifications were statistically significant, with coefficients of +0.25076 and +0.25083, respectively. As a result, organic coffee had a premium price of +28.50% and UTZ certification had a premium of +28.51% compared to regular coffee. Thus, Spanish consumers pay an additional price of +1.17 €/kg for organic certification and +1.18 €/kg for the sustainability label UTZ certification. These findings seem understandable considering that consumer awareness of health and environmental protection has increased and has a significant impact on consumers' food choices. Unexpectedly, Fairtrade certification's coefficient was negative with a percentage price premium of -27.28% discount. Furthermore, Rainforest certification had no effect on market prices for coffee. However, it should be noted that the number of observations of these two certifications was small.

The coffee's intensity had a positive impact on pricing and resulted in a +26.50% premium on the average price. Consumers thus pay an additional price of +1.10 €/kg when this attribute appears on the coffee's packs. Another key factor influencing coffee prices was the origin. A coffee carrying this attribute on its pack, was priced at an 8.78% additional price compared to the regular coffee.

Discussion

In this paper, we applied the hedonic price model to estimate the implicit prices of the main sustainability labels and provided additional insights on which attributes should be considered to achieve better-added value.

According to the findings, coffee prices were positively affected by UTZ certification. The results seem to be consistent with prior studies that revealed that consumers across different countries give value to this certification. Among the countries that are in favour of UTZ certification are the Netherlands, Germany, Belgium, Switzerland and Nordic (CBI, 2021a). Although relatively little organic labelled coffee was sold in the market, the results showed that this certification is an important attribute that positively influences market prices for coffee. These results are consistent with those of other studies showing that organic certification raises the value of coffee (Van Loo et al., 2015).The obtained data were also consistent with those observed by Bernabéu & Díaz (2017) and Ballco & Gracia (2020) for organic olive oils and by Rousseau & Vranken

(2013) for organic apples, who indicated that this certification adds value to the products.

Unexpectedly, Fairtrade certification had a negative impact on market pricing. This finding differs from some published studies that have found that Fairtrade labels increase the value of coffee: Bosbach & Maietta (2019) in the Italian market by about 30%; Bissinger & Leufkens (2017) in the German market by 55%; and Wang (2016) in the US market by 15-30%. According to Goicoechea (2022), the CEO of Iberian Fairtrade, Spain ranks last in Europe in terms of Fair Trade certified products consumption. This means that compared to other European countries, Spain's Fairtrade market is less developed. Furthermore, Spanish consumers spent 2.9 € on fair trade products in 2020 (Fairtrade Ibérica, 2021), while European consumers spent 15 € on these products in the same year (Goicoechea, 2022). Further, a study from 2007 on acceptance of Fair Trade food in the southeastern Spain found that: "the market possibilities for Fair Trade food in the southeast of Spain are promising, as long as the consumer receives adequate information" (Martinez-Carrasco et al., 2007, p.174). A possible explanation for this result might be that Fairtrade certification is still in the growth phase and has not yet found its place in the Spanish market. Furthermore, according to Rotaris & Danielis (2011), the differences in willingness-to-pay values across studies may be related to a range of factors, such as sample characteristics, data collection, analytical methods, coffee variety, geographical context and certifications studied. On the other hand, in Spain, the Frog of Rainforest on coffee packs could be found in 16 brands, which is considered low compared to many European countries, where the Rainforest label could be found in 58 brands in UK, 37 in Germany, 34 in the Netherlands, 20 in Sweden, and 19 brands in Belgium (Rainforest Alliance, 2022), what could explains our results.

Coffee carrying the indication of the country of origin on its packs was priced higher than those without. This finding is consistent with Wang (2016) and Bosbach & Maietta (2019) who found that the origin of coffee is an essential aspect for many coffee consumers'.

The growing consumer concern about health and environmental protection has significantly increased during the recent pandemic (Covid-19). This represents an opportunity to promote sustainability by translating it into actual consumer behaviour. The sustainability certifications demanded by consumers might assist manufacturers in developing more profitable strategies based on product differentiation. Additionally, leading brands may be able to achieve a relevant price premium compared to private labels. Thus, strengthening brand equity might be a possible strategy that affects coffee prices.

Given the limited focus of our study, future studies are needed to better understand Spanish consumers' preferences for coffee, by including other characteristics, such as nutrition and sensory characteristics, package and variety of coffee (Arabica/Robusta) along with sustainability certifications. Additionally, the sample used was based on

coffee marketed at the five main supermarket chains where Spanish consumers purchase their food baskets, excluding specialised establishments such as the Gourmet circuit. Future studies should analyse the extent to which consumers prefer these features and their willingness to pay for them. Future research could also test the validity of our results with sustainability certifications using other food products in the market. Although the study sheds light on the Spanish market, the findings would also be extrapolated to other countries with similar characteristics like the Mediterranean countries, whose economic structures of the business fabric is similar, as well as a similar patterns of food consumption.

Authors' contributions

Conceptualization: N. Merbah, S. Benito-Hernández
Data curation: N. Merbah
Formal analysis: N. Merbah, S. Benito-Hernández
Funding acquisition: N. Merbah, S. Benito-Hernández
Investigation: N. Merbah, S. Benito-Hernández
Methodology: N. Merbah, S. Benito-Hernández
Project administration: Not applicable
Resources: N. Merbah, S. Benito-Hernández
Software: N. Merbah
Supervision: S. Benito-Hernández
Validation: S. Benito-Hernández
Visualization: Not applicable
Writing – original draft: N. Merbah, S. Benito-Hernández
Writing – review & editing: N. Merbah, S. Benito-Hernández

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