



## Understanding product differentiation failures: The role of product knowledge and brand credence in olive oil markets

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### ABSTRACT

This paper tries to shed light on a key question for different foodstuffs: why are product differentiation strategies far from successful in some agri-food markets? Undoubtedly, understanding consumer behaviour in situations where product differentiation failures occur is essential to resolving this issue. To that end, we built a theoretical model to analyse the roles played by both consumer information and inferences made from informational stimuli, given their potential relevance to the differentiation process. We thus examined consumer knowledge structures and brand credence related to attitudes toward a particular foodstuff and a product alternative, as well as the actual consumption of the foodstuff. The theoretical model was tested by an empirical application, using variance-based structural equation modelling (SEM) with the partial least squares (PLS) algorithm. Results showed that attitudes to both products explained the relative consumption of the foodstuff under study. In addition, product knowledge influenced consumers' attitude towards the foodstuff and its consumption, but not the attitude towards the product alternative. On the contrary, the higher the brand equity of the product alternative, the better the attitude towards it. In addition, this factor was shown to have an impact on the attitude towards and consumption of the foodstuff. Therefore, those variables are key to explaining consumer behaviour in such agri-food markets, where increasing consumers' knowledge and creating consumer-based brand equity seem to be appropriate strategies to improve the differentiation process.

### 1. Introduction

Strategies such as product differentiation are key in the agri-food sector, where consumers increasingly demand not only food safety but also high-quality, healthy foodstuffs (EFSA, 2010). Thus, in recent decades, there has been a movement in the agri-food market from uniform and undifferentiated commodities to a re-differentiation of production (Scrinis, 2007). However, this strategy is far from successful in some agri-food markets, where the main attempts at differentiation have been based on extrinsic attributes such as origin (e.g. Aprile, Caputo, & Nayga, 2012). This raises the question of why this strategy has largely failed. According to Dickson and Ginter (1987), the notion of differentiation encompasses a consumer's perception of specific product features. In this regard, understanding consumer behaviour at the microeconomic level becomes essential in order to be able to answer the question posed above and, as a consequence, design and implement

successful commercial strategies that generate increased sales and thus higher incomes (Deaton & Muellbauer, 1980).

This paper attempts to contribute to the development of a theoretical framework in agri-food markets by providing a more in-depth understanding of consumers' decision-making processes, particularly for those agri-food markets that still show product differentiation failures. In order to do so, a theoretical model is built based on core factors that potentially contribute to consumers' perception of product differentiation because of limiting perceptions of specific product features (Dickson and Ginter, 1987). These factors are referred to information and inferences made from informational stimuli, which are in turn embedded in consumer decision making processes (Fishbein & Ajzen, 1975; Steenkamp, 1990 and 1997). Therefore, this model allows us to analyse the roles played by the abovementioned factors by examining the effect of the consumer knowledge structure and brand credence on attitudes towards a particular foodstuff and a product alternative, and

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to the actual consumption of the foodstuff. The theoretical model is tested through an empirical application to olive oil markets in southern Spain using variance-based structural equation modelling (SEM) with the partial least squares (PLS) algorithm.

In this regard, the new perspective developed here is remarkable due to its potential to be adapted and applied to agri-food markets where consumers' issues in differentiating between product features creates a need to study consumer behaviour according to this. Consequently, we study not only widely-used factors in the literature, such as consumer attitude toward the product or consumer information, but also some innovative factors related to beliefs about a product alternative. These are unusual in the available literature, both in theoretical and empirical approaches, going beyond traditional food choice models. Shedding light on how those factors work could help to guide future sales strategies in markets with problems of product differentiation where consumers cannot maximise the utility from their food choices.

The paper is structured as follows. The following section outlines the theoretical framework. The methodological approach is discussed in Section 3, with the results of the research shown in Section 4. Finally, the paper presents the discussion and conclusions in Sections 5 and 6, respectively.

## 2. Building a theoretical model

Widely-used theoretical frameworks, such as the well-known Theory of Reasoned Action (Fishbein & Ajzen, 1975) or Theory of Planned Behaviour (Ajzen, 1991), have been applied to explain the decision-making processes surrounding food choices (e.g. Shepherd, 1990; Saba & Di Natale, 1998). Furthermore, there are theories that have been specifically designed to explain consumer behaviour regarding agri-food products, such as the Steenkamp (1997) conceptual framework. According to such theories, factors related to the product itself, the environment and, of course, the consumer determine the purchase decision-making process. Based on both the Fishbein and Ajzen (1975) and the Steenkamp (1997) theories, we link behavioural actions to attitudes and behavioural beliefs or perceptions, such as acceptance of information about the product reflected in the knowledge of that product and inferences made from informational stimuli embodied in the brand equity (see Fig. 1).

According to Breckler (1984), attitudes consist of cognitive, affective and conative aspects, that is, beliefs, feelings and intentions about the product. However, Schiffman and Kanuk (2004) argue that conation can be examined as an observable behaviour, while, Steenkamp (1997) relates it to choices. We followed these theoretical approaches, which are in line with classical economic theory on consumer behaviour where the focus is on explaining actual or observed choices (Samuelson,

1948). As such, instead of analysing intentions, we focus on actions, given that consumers' self-reported purchases were considered. This is consistent with previous studies (e.g., Saba & Di Natale, 1998) and avoids biases such as the imperfect correlation between intentions and actions (Bagozzi & Dholakia, 1999).

As mentioned above, individual attitudes are key drivers in consumer purchase behaviour since they define the favourable or unfavourable appraisal of an object (Ajzen, 1991) and allow marketers to predict consumer behaviour (Wilcock, Pun, Khanona, & Aung, 2004). Consumers choose among product alternatives according to their attitude about the attractiveness of each product (Steenkamp, 1997). Analysing a single behaviour is a limitation that even Ajzen and Fishbein (1980) acknowledged, with Sheppard, Hartwick, and Warshaw (1988) pointing out the necessity of extending the Ajzen and Fishbein models to consider alternatives given that, when only the product of interest is measured, part of the consumers' decision-making process concerning competing alternatives is overlooked. Accordingly, this research makes a meaningful contribution to the literature considering a first product and a product alternative. Therefore, taking into account that consumer behaviour theories posit that the product associated with the most positive attitude will be chosen (Steenkamp, 1997), attitudes towards two products which can be seen as alternatives — or even substitutes because of the lack of differentiation according to consumers' perceptions — may induce suppressor effects and create conflicting roles. We propose that when the evaluative judgments about a first product are positive, this creates a feeling that should positively influence the consumption of this first product. Conversely, we also argue that positive attitude towards a product alternative may lead to a lower consumption of the first product. Accordingly, the hypotheses are defined as follows:

- H1a. Consumption of the first product increases with positive attitude towards this product.
- H1b. Consumption of the first product decreases with positive attitude towards the product alternative.

Steenkamp (1997) states that the perceptions' integration of each alternative is the basis for a person's attitude toward a concrete alternative, and perceptions are formed by descriptive, informational and inferential processes (Fishbein & Ajzen, 1975; Steenkamp, 1990). A theme highlighted in the consumer behaviour literature is that of informational perceptions, which contribute to the formation and changing of beliefs and attitudes (Fishbein & Ajzen, 1975; Steenkamp, 1997). Therefore, knowledge is recognised as an internal variable which influences consumers' assessment of the products (Ajzen, 2001), but it may also directly influence the intention to purchase (Gracia & De Magistris, 2007) and even consumption, given that knowledge allows

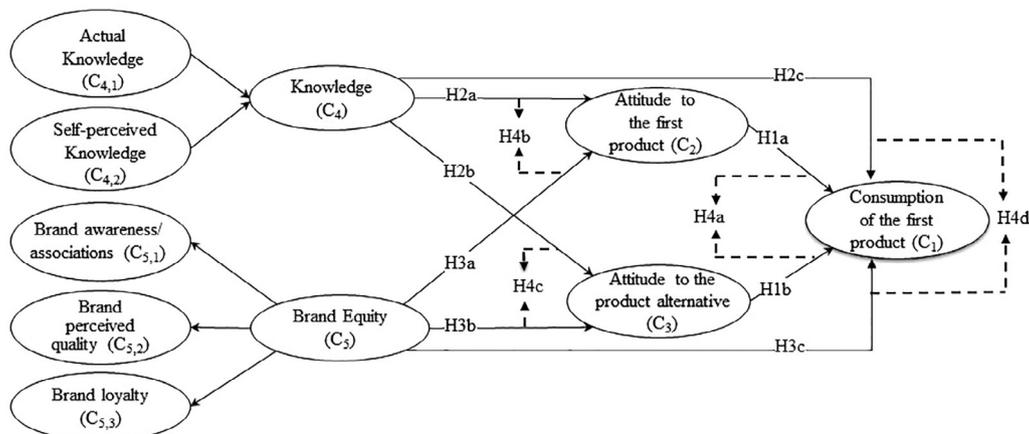


Fig. 1. Conceptual model.

consumers to associate a food's attributes with the consequences of consuming it (Wansink, Westgren, & Cheney, 2005). Specifically, the objective or actual knowledge is described as that which an individual has stored in his/her memory (Brucks, 1985). Scholars acknowledge the key role played by this factor (e.g. Wilcock et al., 2004; Rodríguez-Entrena, Salazar-Ordóñez, & Sayadi, 2013; Rodríguez-Entrena & Salazar-Ordóñez, 2013) but also emphasise the impact of the so-called subjective or self-perceived knowledge (e.g. House et al., 2004). The latter refers to consumers' self-perception about how much they think they know (Brucks, 1985). Some of the literature (e.g. Kalogeras, Valchovska, Baourakis, & Kalaitzis, 2009; Yanguí, Costa-Font, & Gil, 2014) points out that the more information consumers have, the higher the value they attach to the features of high quality products and the higher the price they are willing to pay for it; so, knowledge may contribute to the differentiation process for agri-food products. Therefore, the proposed hypotheses are the following:

H2a. A high level of knowledge increases consumers' positive attitude towards the first product.

H2b. A high level of knowledge decreases consumers' positive attitude towards the product alternative.

H2c. A high level of knowledge increases consumption of the first product.

The concept of inferential formation (Olson, 1978) refers to consumers using previously learned information (termed informational perceptions) to establish relationships between the products' attributes, other beliefs and outcomes, through an inferential process. Brand is one of the main cues in this process since it impacts on other perceptions of the products (Mitchell & Olson, 1977). In an attempt to understand the effects of branding activities, brand equity has become a core concept in the marketing literature from 90's. The notion of brand equity has been influential since Aaker (1991) published his seminal work based on a cognitive psychology perspective. The facet of brand equity related to consumer behaviour, called consumer-based brand equity, represents assets and liabilities, i.e. the value linked to a brand by the customer and its consequences (Aaker, 1991; Keller, 1993). Other definitions (e.g. Srivastava & Shocker, 1991) also highlight the fact that consumers' utility from the consumption of the brand comprises an incremental value derived from non-functional utilities, called experiential, symbolic or subjective antecedents. Consequently, it is assumed that brand equity influences, first, consumer attitudes and, second, it may also directly affect consumption since, according to Keller (1993), brand equity dimensions drive purchase or consumption decisions. Accordingly, a wide range of literature establishes a direct influence between brand equity and purchase decisions, such as the key study by Cobb-Walgreen, Ruble, and Donthu (1995). Indeed, Aaker (1991) argues that brand equity can provide reasons to buy but can also reduce the incentive to try others. One of the most well-known approaches in this regard is that of Aaker (1991), who identifies four main dimensions of brand equity: brand awareness, or the extent to which a brand is recognised or recalled; brand associations, whose meaning is linked to the representations triggered by a brand; brand loyalty, which is related to the consistent purchase of a brand over time; and perceived quality, which is the consumer's perception of brand quality superiority. Likewise, consumer-based brand equity refers to attachments to a brand that can be built beyond the product attributes and even have no inherent value (Keller & Lehmann, 2006), but can be assumed to influence consumer attitudes. Therefore, we assume that the brands' effects in a product directly depend on the positive or negative perception of consumers regarding those brands. However, there is a lack of studies related to the effects from brands in the choice of other products. In light of the above, the resulting hypotheses are:

H3a. The brand equity of the leading brands traditionally associated with the product alternative decreases consumers' positive attitude

towards the first product.

H3b. The brand equity of the leading brands traditionally associated with the product alternative increases consumers' positive attitude towards the product alternative.

H3c. The brand equity of the leading brands traditionally associated with the product alternative decreases consumption of the first product.

Finally, we hypothesise that the attitude towards the product itself has a higher impact on consumption than the attitude towards the product alternative. We also suggest that knowledge is more relevant than brand equity in explaining the attitudes and consumption. Thus, the hypotheses are:

H4a. Attitude toward the first product have a higher impact than attitude toward the alternative product on the consumption of the first product.

H4b. Knowledge has a higher impact than the brand equity of leading brands traditionally associated with the alternative product on the attitude towards the first product.

H4c. Knowledge has a higher impact than the brand equity of leading brands traditionally associated with the product alternative on the attitude towards the product alternative.

H4d. Knowledge has a higher impact than the brand equity of leading brands traditionally associated with the product alternative on the consumption of the first product.

### 3. Material and methodological approach

#### 3.1. Olive oil as a striking example of product differentiation failures

Olive oil markets were selected as case study because in Spain they represent a paradigmatic example of a complex and mature agri-food market, where products that differ in term of intrinsic features become undifferentiated. To understand olive oil markets, it should be pointed out that the olive oil categories (European Commission, 2012) are as follows: "virgin olive oil", "extra virgin olive oil" (EVOO) and "olive oil - composed of refined olive oils and virgin olive oils" (ROO<sup>1</sup>). These categories differ from each other in terms of quality, composition and organoleptic properties, especially when comparing the ROO category and the EVOO category. ROO is obtained by blending a refined olive oil, given that it is a colourless product and has neither flavour nor aroma, with a small but non-regulated percentage of virgin olive oil<sup>2</sup>. EVOO is a category obtained directly from olives and it maintains its healthy (e.g. it contains polyphenols) and organoleptic (e.g. taste, aroma, etc.) properties. Despite those differences, consumers' common perception is of "olive oil" as a general term covering the whole range of categories, so EVOO and ROO could be considered even as substitute products by some consumers. Indeed, Torres-Ruiz, Vega-Zamora, and Gutiérrez-Salcedo (2012) highlight the widespread confusion about the different types of olive oils and their qualities, which leads to competitive disadvantages for EVOO. This may lead to a blurring of the perception of the specific features, thus preventing consumers from optimising their product choices.

In Spain, which is the top olive-oil producer worldwide (IOC, 2015) and where olive oil is a daily consumption product, ROO is the top-selling type of oil, with a 60% market share (MAGRAMA, 2015). Indeed, data from the Spanish Ministry of Agriculture, Food and Environment (MAGRAMA, 2015) suggests an increasing tendency to substitute EVOO with ROO in recent years. This could be a sign of

<sup>1</sup> Here, we use ROO instead of the legal category "olive oil - composed of refined olive oils and virgin olive oils" to make the distinction from EVOO and the generic term "olive oils" clear to readers.

<sup>2</sup> There is no regulation on either the minimum percentage levels of virgin and/or extra virgin olive oil blended or the obligation of displaying such information on the labelling.

consumers' lack of differentiation between the features that are specific to each category. Obviously, according to economic theory, relative price gaps between the products (Shepherd, 2011) could also go some way to explaining consumers' preference for ROO, since price is also an extrinsic cue used for evaluating product alternatives (Monroe, 1982). However, the price gap between EVOO and ROO has been, on average, around  $\text{€}0.35 \text{ kg}^{-1}$  since 2007/2008 (MAGRAMA, 2015), which can be considered a narrow gap compared to the quality gap. Indeed, the similarity in price may reinforce consumers' perception of undifferentiated products; if there is no price gap, consumers may not perceive the higher quality of the more expensive product, due to a phenomenon referred to as "price-reliance schema" (Peterson & Wilson, 1985).

### 3.2. Data and method

To assess the proposed model, we employed data from a questionnaire and applied structural equation modelling (SEM) by means of partial least squares (PLS) (Wold, 1979).

Regarding the questionnaire, it was structured into several sections and administered online from January to September 2016 to 700 regular buyers from a panel at the household level who were over 19 years old. The sample was selected from big cities – more than 100,000 inhabitants – which comprise 37% of the population (INE, 2015) in the Andalusia region (southern Spain). Small (< 20,000 inhabitants) and medium-sized cities (between 20,000 and 100,000 inhabitants) were discarded since most of them are in olive oil producing areas and our focus was on the ordinary urban consumers. Two pre-tests (each applied to 8% of the sample) were first carried out to detect potential biases in comprehension (one with face-to-face surveys and the other using a web-based survey). The sampling was controlled by age and schooling according to Andalusian regional data (INE, 2015) to avoid the underrepresentation of some groups (older people and those with a lower level of schooling, see Table A1 Appendix A) that could arise when using online panels.

The collected data were measured on a differentiated basis for consumption, attitudes, knowledge and brand equity variables (see Table A2 Appendix A).

Consumption was intended to be characterized as an objective behaviour-related latent variable by means of the self-reported actual consumption in quantities and habits. Therefore, it was composed of two observable variables. In order to build the first one ( $C_{n1}$ ), information on the size of the pack and the frequency of purchase of EVOO and ROO as well as of seed oils was requested, by doing so we avoided bias in the consumers' decision making process for not considering competing product alternatives (Sheppard et al., 1988). Then, the relative amount of EVOO (compared to the total oil) used per capita on a monthly basis for each household was estimated. Second, respondents were asked about the number of days per week that each type of the abovementioned oils were used during breakfast, lunch or dinner, in order to estimate a measure which displays the relative importance of EVOO in the weekly uses per household ( $C_{n2}$ ) compared to the total uses. Consumption was considered a composite latent variable given that it was thought up as a human-designed artifact (Henseler, 2017); specifically, it is a compound index built to measure those aspects of consumer behaviour. Consequently, the uses of the product define the consumption.

Questions on the eight observable variables concerning the attitudes towards the two products were asked using 7-point Likert scales (1 indicating the lowest level and 7 the highest). Both the observed variables (Thorsdottir et al., 2012) and the measurement scales (Aaker & Williams, 1998) have been validated by the existing psychometric literature as reflective or common factor latent variables.

Knowledge was measured by means of an indirect approach using both actual or objective knowledge and self-perceived or subjective knowledge. Thus, it was conceptualised with respect to these two

dimensions and designed using a second-order latent variable. In this regard, we extend here earlier studies by creating variables that capture the overall impacts; in doing so, we consider that a conceptual distinction must be made between actual or objective knowledge and self-perceived or subjective knowledge (Park & Lessig, 1981; Brucks, 1985), due to the fact that they affect consumer decision-making processes and behaviour differently. In the actual knowledge dimension, the number of right answers given in the test represented an index of knowledge (Johnson & Russo, 1984); however, to get a more accurate measure of this dimension, the answer "I am not sure" was also introduced and two questions were validated by subsequently asking an open-ended question (Ak<sub>14,15</sub>). The subjective or self-perceived knowledge dimension was measured not only by inquiring about how knowledgeable the consumer is about olive oil, but also by asking a key question: do interviewees know what the refining process does? The latter represents a higher degree of interviewees' self-perception of their own knowledge. Taking into account the characteristics of these two types of knowledge, a composite-composite higher-order latent variable was proposed, since the knowledge dimensions contributed to the overall knowledge latent variable and the relationship between those dimensions could be weak (see Mägi & Julander, 2005) or even non-significant (see Ellen, 1994).

Brand equity was conceptualised as an overall picture of the brand credence made up of its different dimensions (Yoo & Donthu, 2001), so an indirect approach was also followed, applying a second-order latent variable. Yoo, Donthu, and Lee (2000) and Yoo and Donthu (2001) warn that in order to measure brand equity, the dimensions cannot be measured as a simple average, while Washburn and Plank (2002) argued that brand equity may be considered as a higher order model. In line with Yoo et al. (2000), who develop a multidimensional brand equity scale with brand awareness and brand association grouped together since they are said to represent the same underlying concepts, only three dimensions were taken into account: brand awareness/associations, brand perceived quality, and brand loyalty. Observable variables were measured by means of a 7-point Likert-scale (1 to indicate the lowest level and 7 the highest). All the dimensions were analysed via questions about leading brands traditionally linked to the ROO category. Specifically, we used the four most well-known leading brands, whose market share is 26% (Alimarket, 2015), with interviewees indicating which ones were the most consumed, known, or preferred. We modelled brand equity as a reflective-reflective second-order latent variable since we expected both the observable and first-order latent variables to fulfil Jarvis, MacKenzie, and Podsakoff (2003) criteria for reflective measurement theory.

Finally, PLS path modelling was used to test the hypotheses. This technique enables the estimation of structural models – also called inner models – with unobservable or latent variables, by means of observable ones that make up the measurement or outer model (Chin, 1998). PLS path modelling is a suitable tool to estimate the overall relationships in our model since it allows mixed models with both reflective latent variables, which are caused by their observable variables, and composite ones, which are made up of the related observable variables (Henseler, 2017). Also, in order to avoid a potential bias in PLS path modelling when dealing with a reflective paradigm, the well-known consistency at large (Lohmöller, 1989), the common factors were calculated by means of consistent PLS (Dijkstra & Henseler, 2015).

Furthermore, PLS is suitable for estimating higher order (multidimensional) latent variables, allowing more parsimony and less complex models (Law, Wong, & Mobley, 1998). It also helps to avoid multicollinearity issues among predictor latent variables (van Riel, Henseler, Kemény, & Sasovova, 2017), which may be an important issue in SEM (see Iacobucci, 2009), particularly considering PLS is based on linear regressions but this issue has not been widely studied in the literature (Dijkstra & Henseler, 2015). Once the causality relationships had been modelled, a two-stage technique was selected to estimate them (see Wilson & Henseler, 2007) as this is a consistent technique with which to find small effects and model second-order latent

variables with composites. Therefore, the scores of the first-order latent variables were obtained by means of the saturated model, adapting the idea of capturing the total effects of the model presented in [Becker, Klein, and Wetzels \(2012\)](#) and [van Riel et al. \(2017\)](#). In addition, to establish the existence of the second-order constructs, the convergence of the first-order dimensions was tested.

The existence of significant differences between PLS parameter estimates was also explored based on [Rodríguez-Entrena, Schuberth, and Gelhard's \(2018\)](#) approach<sup>3</sup>, so we extended the findings of the structural model by ranking notable factors in consumer behaviour.

In spite of the possibilities offered by PLS, to the authors' knowledge, no previous studies about consumer behaviour in markets with product differentiation issues apply variance-based SEM, and very few of them use covariance-based SEM models (e.g. [Espejel, Fandos, & Flavián, 2008](#)) in olive oil markets.

#### 4. Results

Second-order latent variables need to fulfil measurement model requirements ([Edwards, 2001](#)) in order not to be questioned. According to [Chin \(1998\)](#), the reflective or common factor measurement variables are assessed in terms of both reliability and validity, while composite ones are checked for sign, size and significance, as well as the absence of multicollinearity ([Henseler, 2017](#)). The statistics used to confirm the validity of the second-order latent variables are summarised in [Table 1](#).

The second-order latent variables measurement model yielded a good performance. Only one criterion was not completely fulfilled due to a loading of 0.683. [Carmines and Zeller \(1979\)](#) propose a loading of over 0.707 as a criterion for acceptance, but [Chin \(1998\)](#) relaxes this threshold for a scale in the early stages of development, accepting loadings over 0.6. The scales in this research are at an early stage of development due to the lack of previous empirical research about olive oil, and, in any case,  $Ba_{19}$  was significant ( $p < 0.001$ ), as established by [Cenfetelli and Bassellier \(2009\)](#). Regarding composite measures, they were all significant and did not present multicollinearity issues. Therefore, the conceptualisation of knowledge and brand equity as a second-order construct facilitated the capture of all the effects derived from the complex components which made up those dimensions, and ensured that relevant theoretical components were not lost while still estimating a parsimonious model.

Once the properties of the measures for the second-order latent variables had been assessed, the inner model was also tested using the same statistics as above. The results are shown in [Table 2](#), where it can be observed that the measurement model complied with all the requirements of a good inner model specification.

Then, to assess the nomological validity of our hierarchical model, the parameters and their respective significances were estimated. The results are reported in [Table 3](#).

The first important finding refers to the role played by consumers' attitude towards both the first product and the product alternative, which was shown to increase (H1a) and reduce (H1b), respectively, the relative consumption of the first product. The former is in line with both existing theoretical frameworks about consumer behaviour, such as those of [Ajzen \(1991\)](#) and [Steenkamp \(1997\)](#) mentioned above, and prior research, e.g. [Saba and di Natale \(1998\)](#). The latter means that attitude towards a product alternative does shape consumers' purchase decisions regarding the first product, thus driving the consumption of a product with different intrinsic features and higher objective quality. To the best of the authors' knowledge, no empirical studies to date have analysed that relationship, but it confirms the theoretical approach of [Steenkamp \(1997\)](#). The variance explained by the model in terms of adjusted  $R^2$  was 0.46 for consumption, a good figure for consumer behaviour studies, where [Falk and Miller \(1975\)](#) set the lowest

**Table 1**  
Measurement model: Indicators' loadings or weights and construct reliability for second-order latent variables.

| $C_i/X_i$  | Loadings/Weights <sup>b</sup> | $\alpha$ | $\rho_x$ | $\rho_a$ | AVE  |
|--|-------------------------------|----------|----------|----------|------|
| Actual Knowledge, $C_{4,1}$ <sup>§,a</sup>             |                               | n.a.     | n.a.     | n.a.     | n.a. |
| Ak <sub>11</sub>                                       | 0.38                          |          |          |          |      |
| Ak <sub>12</sub>                                       | 0.28                          |          |          |          |      |
| Ak <sub>13</sub>                                       | 0.23                          |          |          |          |      |
| Ak <sub>14</sub>                                       | 0.41                          |          |          |          |      |
| Ak <sub>15</sub>                                       | 0.38                          |          |          |          |      |
| Self-perceived Knowledge, $C_{4,2}$ <sup>§,a</sup>     |                               | n.a.     | n.a.     | n.a.     | n.a. |
| Sk <sub>16</sub>                                       | 0.69                          |          |          |          |      |
| Sk <sub>17</sub>                                       | 0.61                          |          |          |          |      |
| Brand awareness/associations, $C_{5,1}$ <sup>§,c</sup> |                               | 0.82     | 0.84     | 0.82     | 0.62 |
| Ba <sub>18</sub>                                       | 0.78                          |          |          |          |      |
| Ba <sub>19</sub>                                       | 0.68                          |          |          |          |      |
| Ba <sub>20</sub>                                       | 0.88                          |          |          |          |      |
| Brand quality, $C_{5,2}$ <sup>§,c</sup>                |                               | 0.83     | 0.84     | 0.84     | 0.64 |
| Bq <sub>21</sub>                                       | 0.85                          |          |          |          |      |
| Bq <sub>22</sub>                                       | 0.82                          |          |          |          |      |
| Bq <sub>23</sub>                                       | 0.71                          |          |          |          |      |
| Brand loyalty, $C_{5,3}$ <sup>§,c</sup>                |                               | 0.87     | 0.84     | 0.84     | 0.64 |
| Bl <sub>24</sub>                                       | 0.87                          |          |          |          |      |
| Bl <sub>25</sub>                                       | 0.87                          |          |          |          |      |
| Bl <sub>26</sub>                                       | 0.75                          |          |          |          |      |

Note: n.a. means not applicable.

Source: Authors' elaboration.

<sup>§</sup> Exogenous Latent Variable.

<sup>a</sup> Variance Inflation Factors (VIF) among indicators within each construct is under 3.3 ([Diamantopoulos & Siguaw, 2006](#)).

<sup>b</sup> All the loadings and weights are significant at  $p < 0.001$  based on a two-tailed  $t$ -test for  $t_{(4999)}$  except for  $Ak_{13}$ , which was significant at  $p < 0.002$ .

<sup>c</sup> Heterotrait-monotrait ratio of correlations – HTMT – ([Henseler, Ringle, & Sarstedt, 2015](#)):  $C_{5,1}$  and  $C_{5,2} = 0.77$ ;  $C_{5,1}$  and  $C_{5,3} = 0.80$ ;  $C_{5,2}$  and  $C_{5,3} = 0.74$ .

recommended level at 0.10. The effect size showed a medium-large effect from the attitude towards the first product and a small-medium one from the attitude towards the product alternative, a result further confirmed by the test of the differences between path coefficient estimates (H4a) – since the confidence interval of the difference did not contain zero.

It is also worth noting that knowledge influenced the consumers' judgment about EVOO (H2a) and their consumption (H2c). This relationship was as expected given that greater knowledge about olive oils contributed to positive feelings about EVOO and its consumption, which showed a medium-large and a small effect size, respectively. That is consistent with previous studies such as [Kalogeras et al. \(2009\)](#) or [Mtimet, Zaiet, Zairi, and Hzami \(2013\)](#), and also supports the results of [Yangui et al. \(2014\)](#), who find changes in consumers' preferences in olive oil markets when they have more information. However, knowledge is unlikely to affect the attitude towards the product alternative (H2b).

The results also allowed us to confirm that the higher the brand equity of the product alternative leading brands, the better the attitude towards the product alternative (H3b). This finding was as expected and similar to those revealed in studies for different products and services, such as [Cobb-Walgren et al. \(1995\)](#). On the contrary, although the brand equity did have an impact on shaping attitude towards the first product (H3a) and its consumption (H3c), this impact was small.

Finally, since the 99% confidence intervals did not contain zero, significant differences can be highlighted between the estimated impacts of knowledge and brand equity on these attitudes. Specifically, knowledge had a stronger effect on attitude towards EVOO than brand equity did (H4b). However, we also expected knowledge to exert a significant and stronger influence than brand equity on the attitude

<sup>3</sup> A spreadsheet is available upon request from the authors.

**Table 2**  
Measurement model: Indicators' loadings or weights and construct reliability.

| C <sub>i</sub> /X <sub>i</sub>  | Loadings/<br>Weights <sup>a</sup> | α     | ρ <sub>x</sub> | ρ <sub>a</sub> | AVE   |
|---|-----------------------------------|-------|----------------|----------------|-------|
| Consumption, C <sub>1</sub> <sup>η,b</sup>                                |                                   | n.a.  | n.a.           | n.a.           | n.a.  |
| Cn <sub>1</sub>   | 0.57                              |       |                |                |       |
| Cn <sub>2</sub>   | 0.49                              |       |                |                |       |
| Attitude to the first product,<br>C <sub>2</sub> <sup>η,c</sup>           |                                   | 0.85  | 0.85           | 0.85           | 0.58  |
| A <sub>3</sub> <sup>product</sup>   | 0.76                              |       |                |                |       |
| A <sub>4</sub> <sup>product</sup>   | 0.78                              |       |                |                |       |
| A <sub>5</sub> <sup>product</sup>   | 0.77                              |       |                |                |       |
| A <sub>6</sub> <sup>product</sup>   | 0.74                              |       |                |                |       |
| Attitude to the product<br>alternative, C <sub>3</sub> <sup>η,c</sup>     |                                   | 0.9   | 0.9            | 0.9            | 0.69  |
| A <sub>7</sub> <sup>alternative</sup>                                     | 0.86                              |       |                |                |       |
| A <sub>8</sub> <sup>alternative</sup>                                     | 0.79                              |       |                |                |       |
| A <sub>9</sub> <sup>alternative</sup>                                     | 0.84                              |       |                |                |       |
| A <sub>10</sub> <sup>alternative</sup>                                    | 0.83                              |       |                |                |       |
| Knowledge, C <sub>4</sub> <sup>ξ,b</sup>                                  |                                   | n.a.  | n.a.           | n.a.           |       |
| Ak-C <sub>4,1</sub>   | 0.86                              |       |                |                |       |
| Ak-C <sub>4,2</sub>   | 0.26                              |       |                |                |       |
| Brand equity to the product<br>alternative, C <sub>5</sub> <sup>ξ,c</sup> |                                   | 0.855 | 0.855          | 0.859          | 0.664 |
| Ba-C <sub>5,1</sub>   | 0.86                              |       |                |                |       |
| Bq-C <sub>5,2</sub>   | 0.83                              |       |                |                |       |
| Bl-C <sub>5,3</sub>   | 0.74                              |       |                |                |       |

Note: n.a. means not applicable.

Source: Authors' elaboration.

<sup>η</sup> Endogenous Latent Variable.

<sup>ξ</sup> Exogenous Latent Variable.

<sup>a</sup> All the loadings and weights are significant at  $p < 0.001$  based on a two-tailed  $t$ -test for  $t_{(4999)}$  except C<sub>4,2</sub> which was significant at  $p < 0.01$ .

<sup>b</sup> Variance Inflation Factors (VIF) are under 3.3 (Diamantopoulos & Siguaw, 2006).

<sup>c</sup> Heterotrait-monotrait ratio of correlations – HTMT – (Henseler, et al., 2015): C<sub>2</sub> and C<sub>3</sub> = 0.12; C<sub>2</sub> and C<sub>5</sub> = 0.21; C<sub>3</sub> and C<sub>5</sub> = 0.51.

**Table 3**  
Path coefficients and significance test.

| Hypotheses  | Path coefficients                    | Percentile bootstrap 0.5% | Percentile bootstrap 99.5% | Hypothesis results | f <sup>2,a</sup> |
|---|--------------------------------------|---------------------------|----------------------------|--------------------|------------------|
| Attitude <sup>product</sup> → Consumption   | H1a 0.41 <sup>***</sup><br>(0.033)   | 0.32                      | 0.52                       | Supported          | 0.24             |
| Attitude <sup>alternative</sup> → Consumption   | H1b -0.27 <sup>***</sup><br>(0.033)  | -0.36                     | -0.17                      | Supported          | 0.10             |
| Knowledge → Attitude <sup>product</sup>   | H2a 0.46 <sup>***</sup><br>(0.034)   | 0.37                      | 0.54                       | Supported          | 0.27             |
| Knowledge → Attitude <sup>alternative</sup>   | H2b 0.06 <sup>n.s.</sup><br>(0.036)  | -0.02                     | 0.15                       | Not supported      |                  |
| Knowledge → Consumption   | H2c 0.12 <sup>**</sup><br>(0.037)    | 0.02                      | 0.21                       | Supported          | 0.02             |
| Brand equity → Attitude <sup>product</sup>  | H3a -0.13 <sup>**</sup><br>(0.040)   | -0.23                     | -0.02                      | Supported          | 0.02             |
| Brand equity → Attitude <sup>alternative</sup>  | H3b 0.46 <sup>***</sup><br>(0.033)   | 0.42                      | 0.61                       | Supported          | 0.35             |
| Brand equity → Consumption  | H3c -0.17 <sup>***</sup><br>(0.040)  | -0.28                     | -0.07                      | Supported          | 0.04             |
| Coefficient differences   |                                      |                           |                            |                    |                  |
| Δ Attitude <sup>product</sup> → Consumption,<br>Attitude <sup>alternative</sup> → Consumption     | H4a 0.15 <sup>**</sup><br>(0.054)    | 0.03                      | 0.24                       | Supported          |                  |
| Δ Knowledge → Attitude <sup>product</sup> ,<br>Brand equity → Attitude <sup>product</sup>         | H4b 0.32 <sup>***</sup><br>(0.062)   | 0.16                      | 0.48                       | Supported          |                  |
| Δ Knowledge → Attitude <sup>alternative</sup> ,<br>Brand equity → Attitude <sup>alternative</sup> | H4c 0.46 <sup>***</sup><br>(0.042)   | 0.34                      | 0.56                       | Opposite supported |                  |
| Δ Knowledge → Consumption,<br>Brand equity → Consumption  | H4d -0.05 <sup>n.s.</sup><br>(0.058) | -0.20                     | 0.09                       | Not Supported      |                  |

Note: \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ ; n.s. non-significant – based on a two-tailed  $t$ -test for  $t_{(4999)}$  from a bootstrapping technique.

Note: Standard errors in brackets.

Note: Variance Inflation Factors (VIF) of each set of predictor construct for each subpart of the model are under 3.3 (Diamantopoulos & Siguaw, 2006).

Source: Authors' elaboration.

<sup>a</sup> According to Cohen (1988), f<sup>2</sup> values of 0.02, 0.15 and 0.35 result in small, medium and large effects, respectively.

towards ROO, but, contrary to expectations, knowledge did not have an impact on ROO attitude whereas brand equity showed a marked and significant effect (H4c). In addition, there were no differences in how knowledge and brand equity influenced consumption (H4d).

The explained variance accounted for the attitude towards EVOO was 0.25 (adjusted R<sup>2</sup>) and 0.26 (adjusted R<sup>2</sup>) for attitude towards ROO, showing good predictive power, as mentioned above. Indeed, it is worth pointing out that only two latent variables — knowledge and brand equity — were able to explain these levels of variance in consumer attitude, making them core drivers in a parsimonious model. Furthermore, according to Falk and Miller (1975), this type of parsimonious model is more powerful than the broad application of a “shotgun”. In addition, the relative predictive power of the endogenous reflective latent variables (C<sub>2</sub> and C<sub>3</sub>), measured by Stone-Geisser's Q<sup>2</sup> value (omission distance of 6), was over 0, showing a good predictive power in the model (Stone, 1974). Appendix B contains the correlation matrix for the latent variables, considering the second order latent variables.

### 5. Discussion

Several implications stem from this study. First, we provide empirical evidence that attitudes towards both products become a positive or negative evaluative judgment of the overall purchase situation. Therefore, attitude toward product alternatives is a meaningful predictor of actual consumption, particularly in those agri-food markets where consumers' may have difficulties differentiating between products that are heterogenous in terms of intrinsic features but more homogeneous in term of uses. The consumers may perceive that all the products in question (olive oils) have similar or interchangeable features, added value and culinary uses to those corresponding to the higher quality product (EVOO), making price elasticity of demand higher and increasing the substitution effect. According to our model, those perceptions partially stem from the consumers' lack of knowledge

and the brand equity performance of leading brands associated with a product alternative.

The differential impact of consumers' information about the product to explain the attitudes towards the products may provide an indication of the depicted baseline scenario. Consequently, the more knowledgeable consumers appear to be more aware of the beneficial intrinsic features of the product with the highest objective quality (EVOO), which is also reflected in its consumption. Therefore, assuming that consumers make an overall evaluation of the products according to their perceptions, they positively assess EVOO because of its features but do not negatively judge the product alternative, ROO. Instead, they simply recognise the substantial differences between the two types of products, and probably even consider them to be differentiated products which can, depending on the context, share a relationship of complementarity. Indeed, ROO can be seen as a superior alternative to any seed oil for several culinary uses.

The Italian olive oil markets provide a good comparison to highlight how consumer behaviour differs substantially in the Spanish market. Specifically, the better-informed consumers in the Italian market, who are able to maximise the utility of their choices, could explain the polarised Italian domestic demand towards EVOO. This leads to a relevant price gap between the two types of olive oil – €1.90 kg<sup>-1</sup> for the last three years (average price at origin of €4.20 kg<sup>-1</sup> and €2.28 kg<sup>-1</sup> for EVOO and ROO) (European Commission, 2017).

Regarding brand equity, this study also provides evidence that consumers' inferences made from informational stimuli, embodied in a conventional branding construct, are key to explaining not only the attitude about the product the brand is associated with, but also to shaping attitudes regarding other options available in the marketplace and their consumption. This is a notable finding from which it can be inferred that a share of consumers may trust that the leading brands have specific attributes, for example quality in a broad sense, which EVOO could not be able to offer compared to the traditional ROO endorsed by brand equity. Hence, companies with established credibility, reputation and high perceived brand equity may succeed in building distinctive brands which go beyond an objective assessment of the quality of other products and, as occurs in our case, hampering an effective differentiation by quality. This is particularly applicable when products seem to share features of substitutability for consumers, making the development of brand equity a crucial factor for shaping consumer decisions since alleviates the issue of asymmetric information by means of the brands as a strategic and salient quality cue.

At institutional level, there have been several attempts with the aim of addressing this situation by means of different reformulations of the labelling regulations. The latest modifications to European Union (EU) regulations (European Commission, 2012) sought to shed more light on the distinction between the qualities of the olive oil categories, reformulating the labelling scheme to guarantee that the products do in fact possess clear differentiated values. The EU labelling regulation stipulates that products must include a description of the category, pointing out which olive oils are obtained directly from olives and solely by mechanical means (EVOO) and which have undergone a refining process and then are blended with oils obtained directly from olives (ROO). Furthermore, regarding EVOO, marketers can make explicit reference to some positive features such as taste (fruity, bitter and pungent). However, two main issues arise. First, a high level of knowledge is needed to discern what the label is truly indicating with those explanations about the production processes, whereas consumers' related knowledge nowadays is scarce (Cabrerá, 2016). In addition, a substantial number of consumers do not understand what a refining process involves, despite conditioning drastically the products' intrinsic quality features, and conceptualise it as a valuable procedure to obtain a purer olive oil. Second, ROO brands continually use taste references – e.g. “mild” – as a marketing strategy and that could be another source of confusion for consumers, contributing to the difficulty in differentiating between categories. Indeed, consumers are used to seeing the

abovementioned “mild” reference on the labels, but not the others quality claims related to a fruity, bitter or pungent taste, which have recently come to be used as an information source of differentiation. Furthermore, these informational stimuli related to taste adjectives such as bitter or pungent could evoke negative attributes, being even counter-productive, for an untrained consumer, although they are exclusively based on technical parameters about the organoleptic quality. Consequently, the labels may not fulfil their role as a basic source of information to combat the issue of asymmetric information, especially considering that no indication is given on the label about the amount of virgin olive oil that is blended to produce ROO, since this percentage is not regulated. In fact, according to Marano-Marcolini and Torres-Ruiz (2017) this poor categorisation hinders consumer learning and choices, and for many years has even influenced commercial strategies in the olive oil sector, showing not to be sufficient to avoid misleading consumers as to the real characteristics of virgin oils.

In light of this situation, from a managerial point of view, the cooperative sector should focus its strategy on both increasing consumers' knowledge and creating consumer-based brand equity for the product with the highest objective quality, EVOO. On the contrary, promotional initiatives may not work and may even be detrimental because of the product undifferentiation (Barjolle and Sylvander, 2002). Consumer training about differential features of the products, mainly production processes and organoleptic profiles, becomes instrumental in order to understand labels and differentiate qualities accordingly. In this regard, the greatest challenge is to set up joint investments by the cooperative sector and to encourage regional governments' support as an agent of change through the policy-making process. At the same time, the cooperative sector should start by reducing the high number of EVOO brands through integration processes, given that the first step to enhancing product differentiation is building brand awareness (Aaker, 1991), which can be hampered by the numerous EVOO brands belonging to small cooperatives. Brand equity may be a driving force in gaining a competitive advantage by contrasting brands' personalities. In the medium-term, the first step may be to contrast between leading EVOO and ROO brands by means of common trademarks around which to build brand equity, and, later, between different EVOO brands. A hybrid strategy involving both key factors simultaneously could even be developed, so that the creation of EVOO brand equity is underpinned by the consumer training about quality in olive oils, thus creating positive expectations of the product.

## 6. Conclusions

This study attempts to contribute to the development of a theoretical framework for agri-food markets with differentiation failures. We develop a theoretical model and perform an empirical application in order to analyse consumption patterns. Theoretical model is focused on product knowledge, together with product alternative's brand credence and attitudes; and the empirical application is tested on olive oil markets, considering that different products (EVOO and ROO) in term of intrinsic features may become undifferentiated. We conclude that the effect of product alternatives is key to explaining consumer behaviour in such markets, given that the attitude towards a product alternative has a relevant impact on the consumption of the foodstuff in question. At the same time, our results provide evidence that product knowledge and the brand equity of the leading brands of the alternative product have a predictive relevance for the attitudes.

The differential impacts of the underlying predictors, knowledge and brand, and the consideration of product alternatives may be replicable in different agri-food markets with differentiation failures. These results and the abovementioned recommendations could be particularly transferable to those agri-food markets where quality is nowadays hardly exploitable as a marketing tool, since products are considered almost as a commodity or interchangeable by consumers. Nonetheless, it is worth highlighting that the potential of transferability

is conditioned by the features of each agri-food market, given the specificities of the olive oil sector and the cultural context of the consumers where the study has been developed. Thus, aprioristic assessment of those predictors in other agri-food markets should not be done with the aim of generalising the findings, while there is no enough critical mass of researching to support it.

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### Appendix A.

Table A1 and Table A2

**Table A1**  
Descriptive analysis of sample and population.

|                 | Characteristics    | Sample (%) | Population (%) <sup>a</sup> | $\chi^2$ test <sup>b</sup>    |
|-----------------|--------------------|------------|-----------------------------|-------------------------------|
| Gender          | Female             | 52.7       | 51                          | $\chi^2 = 0.11$<br>(p = 0.73) |
| Age             | 20–39 years        | 34         | 36.4                        | $\chi^2 = 1.80$<br>(p = 0.40) |
|                 | 40–54 years        | 35         | 28.6                        |                               |
|                 | 55 + years         | 31         | 35                          |                               |
| Schooling level | University studies | 27.4       | 25.7                        | $\chi^2 = 0.14$<br>(p = 0.70) |

Source: Authors' elaboration.

<sup>a</sup> Data from the Census (INE, 2011).

**Table A2**  
Latent and observable variables.

| Latent Variables   | Observable Variables  | Source   |
|--|---|--|
|  |   | Adapted from   |
| Consumption (C <sub>1</sub> ) <sup>¶</sup><br>– Referring to EVOO                        | Cn <sub>1</sub> : Relative consumption of EVOO  | Saba and di Natale (1998)                                      |
| Attitude to the first product (C <sub>2</sub> ) <sup>¶</sup><br>– Referring to EVOO      | Cn <sub>2</sub> : Relative uses for cooking with EVOO<br>A <sub>3</sub> <sup>product</sup> : The degree to which you need EVOO is...<br>A <sub>4</sub> <sup>product</sup> : The degree to which you feel EVOO is good for you<br>A <sub>5</sub> <sup>product</sup> : The degree to which you would recommend EVOO is.....<br>A <sub>6</sub> <sup>product</sup> : The enjoyment you get from the consumption of EVOO is...   | Thorsdottir et al. (2012)                                      |
| Attitude to the product alternative (C <sub>3</sub> ) <sup>¶</sup><br>– Referring to ROO | A <sub>7</sub> <sup>alternative</sup> : The degree to which you need ROO is...<br>A <sub>8</sub> <sup>alternative</sup> : The degree to which you feel ROO is good for you<br>A <sub>9</sub> <sup>alternative</sup> : The degree to which you would recommend ROO is.....<br>A <sub>10</sub> <sup>alternative</sup> : The enjoyment you get from the consumption of ROO is...   |  |
| Knowledge (C <sub>4</sub> ) <sup>§</sup>   | Actual knowledge (C <sub>4,1</sub> ) <sup>§</sup><br>Ak <sub>11</sub> : ROO is the superior category of olive oils<br>Ak <sub>12</sub> : The taste of EVOO is always strong and bitter<br>Ak <sub>13</sub> : ROO contains refined olive oil plus EVOO<br>Ak <sub>14</sub> : I know at least one olive oil variety (name it)<br>Ak <sub>15</sub> : I know at least one olive oil Protected Designation of Origin (name it)   | Fotopoulos and Krystallis (2001);<br>Torres-Ruíz et al. (2012) |
|  | Self-perceived knowledge (C <sub>4,2</sub> ) <sup>§</sup><br>Sk <sub>16</sub> : How knowledgeable are you about the features of and matters concerning olive oil?<br>Sk <sub>17</sub> : Do you know what the refining process does?   | Brucks (1985); House et al. (2004)                             |
| Brand equity (C <sub>5</sub> ) <sup>§</sup><br>– Referring to ROO                        | Brand awareness/associations (C <sub>5,1</sub> ) <sup>§</sup><br>Ba <sub>18</sub> : I can recognize (leading brand) among other competing brands [including my brand]<br>Ba <sub>19</sub> : When I think of olive oil brands, I have no difficulty in imagining (leading brand) in my mind<br>Ba <sub>20</sub> : I am aware of (leading brand) standing out among other competing brands [including my brand]   | Yoo and Donthu (2001)  |
|  | Brand perceived quality (C <sub>5,2</sub> ) <sup>§</sup><br>Bq <sub>21</sub> : The likelihood that (leading brand) quality will never disappoint me [in comparison to alternative brands including my brand] is...<br>Bq <sub>22</sub> : The likely image of quality of (leading brand) [in comparison to alternative brands including my brand] is...<br>Bq <sub>23</sub> : (Leading brand) has a higher quality in comparison to alternative brands including my brand... |  |
|  | Brand loyalty (C <sub>5,3</sub> ) <sup>§</sup><br>Bl <sub>24</sub> : The likelihood that (leading brand) is a purchase choice is...<br>Bl <sub>25</sub> : I would recommend my family and friends to buy (leading brand) among other competing brands<br>Bl <sub>26</sub> : Even when another brand is cheaper, I would prefer the (leading brand)  |  |

Source: Authors' elaboration.

<sup>¶</sup> Endogenous Latent Variable.

<sup>§</sup> Exogenous Latent Variable.

## Appendix B.

Table B1

Table B1

Latent variables' correlation matrix – considering second order latent variables.

|    | C1    | C2    | C3    | C4    | C5   |
|----|-------|-------|-------|-------|------|
| C1 | 1.00  |       |       |       |      |
| C2 | 0.55  | 1.00  |       |       |      |
| C3 | –0.41 | –0.11 | 1.00  |       |      |
| C4 | 0.37  | 0.48  | –0.04 | 1.00  |      |
| C5 | –0.43 | –0.22 | 0.51  | –0.19 | 1.00 |

Source: Authors' elaboration.

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