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Using PLS-SEM for assessing negative impact and cooperation as antecedents of gray market in FMCG supply chains: an analysis on Spanish wholesale distributors

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Abstract

Purpose – Within the fast-moving consumer goods (FMCG) supply chain, one of the problems facing the distribution channel strategy is the presence of the gray market. The article shows two novel antecedents of the participation of official distributors in this gray channel: Negative impact on distributor performance and the relationship with their supplier. Knowledge of this background helps to preserve the strategy outlined for the official distribution channel.

Design/methodology/approach – Data were collected from 172 Spanish wholesale distributors and analyzed using PLS-SEM.

Findings – The authors found that the damage through negative affectation in the official distributor's performance and the cooperation provided by the manufacturer, have different effects. While affectation is shown to be a powerful antecedent of participation in the gray market, the effect of perceived manufacturer cooperation does not show strong results.

Practical implications – In business practice, these findings lead the manufacturer to keep transactions carried out in the gray market at low levels and provide cooperation to official distributors to guarantee the official channel strategy aimed at efficiency in the distribution of branded goods.

Originality/value – The background of the gray market discussed in the study has not been previously analyzed in the literature. In this way, the authors contribute to the knowledge of such a common problem as the presence of the gray market in the segmentation of distribution channels of high-demand products.

Keywords Gray market, Negative impact, Opportunism, Cooperation, Fast-moving consumer goods (FMCG), Partial least squares structural equation modeling (PLS-SEM)

Paper type Research paper

1. Introduction

Fast-moving consumer goods' (FMCG) supply chain is often faced with a major problem in the design of the distribution channel strategy: The gray market incidence (Zhang and Feng, 2017). Particularly when the distribution channel is designed for branded goods (Antia *et al.*, 2004), it is defined as "the sale of genuine trademarked products through distribution channels unauthorized by the manufacturer or brand owner" (Antia *et al.*, 2006, p. 92). The gray market originates from the intermediation that distributors outside the official network do by buying in markets where the price is lowest and selling in those where a higher price is paid (Zhao *et al.*, 2021) (Figure 1). This arbitrage generates important business for these agents (Berman, 2004). On the other hand, this type of action hinders the strategy devised for

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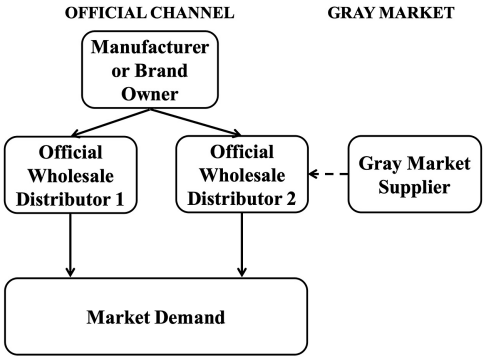


Source(s): Own elaboration

Figure 1.
Gray market flow

the marketing channel and brand positioning (Cao and Zhang, 2019). Under this business environment, firms in the official network suffer substantial losses in profits because more products are sold in low-margin markets, and the overall performance of the official distribution channel suffers (Gudigantala and Bicen, 2019). This situation becomes difficult when distributors that comply with their agreements face an unanticipated threat to their business (Johnson and Sohi, 2016) because the gray channel competes on price without providing services or abiding by the rules of official distribution (Berman, 2004).

An example of gray market incidence in trademarks of FMCG is observed in the products of Coca-Cola Company. Frequently in Spain, we find Coca-Cola products originating from European distributors such as Germany or Denmark. The lower sales prices cause this situation which affects distributors in the markets of origin (Antia *et al.*, 2006). Spanish distributors then benefit from the supply of cheaper goods through the unauthorized gray market. This type of gray market is also called parallel import (Berman, 2004; Li *et al.*, 2021). As part of its internationalization strategy, Coca-Cola Company segments the market territorially, but the agreements are opportunistically altered by the gray market (Berman and Dong, 2015). This situation damages the performance of official Spanish distributors that remain loyal to their distribution agreements.

In the field of supply chain management, the gray market has a significant impact on the marketing channel (Li *et al.*, 2016; Zhao *et al.*, 2021) to such an extent that some manufacturers decided to create an alliance to develop a joint strategy to mitigate its effects. Thus, AGMA (Alliance for Gray Market and Counterfeit Abatement) includes companies that manufacture technological products (Cisco, Hewlett–Packard, Microsoft, [. . .]) and whose members have sales of more than US$ 425 billion. The objective of this alliance is to raise awareness among legislators and government officials, but the gray market is a legal action that is difficult to control legislatively (Berman and Dong, 2015). AGMA estimates that the products distributed through the gray market are worth US$ 63 billion (Zhang and Feng, 2017), 8% of global IT industry sales (Li *et al.*, 2016). An added problem is e-commerce because it is a facilitator of the gray market (Zhao *et al.*, 2021); we can see distributors like Amazon, eBay and Alibaba supplying through it (Gudigantala and Bicen, 2019). The global pandemic situation caused by COVID-19 has exacerbated e-commerce and, as a result, an increase in gray market transactions and difficulties in managing strategic segments designed for the efficient management of the official distribution channel are foreseeable.

Some of the most relevant articles published in recent years have addressed important aspects of the gray market and its impact on the supply chain (see Table 1). However, we

	Product category or sector	Supply chain agents studied	Variables studied
Altug (2017)	Short life-cycle products	Manufacturer and Retailer	Demand-cannibalization and inventory correction
Antia *et al.* (2006)	Branded personal care	Manufacturer	Gray market incidence
Bergen *et al.* (1998)	Technology (SIC 35, SIC 36)	Manufacturer	Tolerance gray market incidence
Berman (2008)	Luxury brands	Manufacturer	Manufacturer performance
Bicen and Gudigantala (2014)	Parallel imports	Manufacturer	Multichannel strategy
Cao and Zhang (2019)	Parallel imports	Manufacturer	Price strategy
Dasu *et al.* (2012)	Pure fashion item	Producer and a retailer	Producer profit
Gudigantala and Bicen (2019)	Technology	WEB consumer	Ethical judgment
Huang *et al.* (2004)	Beverage, watch and phone	Consumer	Buy, product type and brand
Iqbal and Feick (2002)	Hypothetical (use of scenarios)	Sales Managers'	Dependence, managerial incentives
Li *et al.* (2016)	Parallel imports	Manufacturer	Manufacturers' strategies and profits
Li *et al.* (2021)	Technology	Manufacturer	Technology licensing
Lu *et al.* (2020)	Parallel imports	Manufacturer and distributor	Sales and profits
Shao *et al.* (2016)	Branded goods	Manufacturer	Firms' Profits
Yeung and Mok (2012)	Automobile	Manufacturer	Manufacturing and distribution strategies
Zhao *et al.* (2016)	Luxury brands	Official coach websites	Degree of online gray market activities
Zhang and Feng (2017)	Luxury brands	Brand owners	Profits of brand owners

Source(s): Own elaboration

Table 1. Relevant studies on gray market (1998–2021)

believe that crucial aspects still need to be researched, such as Relational Norms because they promote cooperation and reduce opportunism (Watson IV *et al.*, 2015); key elements in gray market prevention. There are also sectors still to be analyzed, the viewpoint of some supply chain agents has not been considered, nor have the variables been studied that explain gray market incidence.

We present a research work with a causal model of gray market participation based on vertical and horizontal cooperation in the official distribution channel. We developed our study in a context of FMCG that has not been dealt with in the academic literature on the gray market in favor of other sectors such as technology (Bergen *et al.*, 1998; Gudigantala and Bicen, 2019; Li *et al.*, 2021), automobile (Yeung and Mok, 2012), luxury brands (Berman, 2008; Zhang and Feng, 2017; Zhao *et al.*, 2016), branded personal care products (Antia *et al.*, 2006) or parallel imports (Bicen and Gudigantala, 2014; Cao and Zhang, 2019; Li *et al.*, 2016; Lu *et al.*, 2020). The study of the gray market in the context of FMCG is important because one of the causes of this type of distribution is the presence of prestigious branded products in high demand (Antia *et al.*, 2004, 2006), and the presence of these types of products plays a fundamental role in this sector. In this sense, we consider that our work presents a novel vision in a sector not previously studied academically. Our empirical analysis has been carried out with a sample of official Spanish wholesale distributors of FMCG.

The literature has insisted on analyzing the gray market from the perspective of the manufacturer or brand owners as the main subjects affected (Antia *et al.*, 2006; Bergen *et al.*, 1998;

Berman, 2008; Li *et al.*, 2021; Lu *et al.*, 2020; Shao *et al.*, 2016; Yeung and Mok, 2012). However, the incidence of the gray market has a direct impact on the business of official wholesale distributors due to the effect it has on their performance and the loss of sales to distributors that participate in the gray market. This supply chain agent has not received attention from the literature, limited to the retailer (Dasu *et al.*, 2012; Lu *et al.*, 2020), even though there is a significant detriment to the performance of official intermediaries and the manufacturer or brand owner; in this sense, we understand that our work makes an interesting contribution.

The main theoretical novelties of our research are considering the gray market, not as a business opportunity based on the arbitrage of a price difference, as we observed in previous studies (Antia *et al.*, 2004, 2006; Bicen and Gudigantala, 2014; Cao and Zhang, 2019; Gudigantala and Bicen, 2019; Li *et al.*, 2021; Lu *et al.*, 2020; Zhao *et al.*, 2021), but as an option to defend its performance from the opportunistic actions of competing official distributors. The incidence of the gray market has been explained through its impact on pricing strategy (Cao and Zhang, 2019), performance (Berman, 2008), profits (Dasu *et al.*, 2012; Li *et al.*, 2016; Lu *et al.*, 2020; Shao *et al.*, 2016; Zhang and Feng, 2017) or multichannel strategy (Bicen and Gudigantala, 2014; Li *et al.*, 2016; Yeung and Mok, 2012). Nevertheless, we also believe that the relational element should play an important role in the decisions taken within the distribution channel, as studies framed within the relational paradigm have amply shown (Hogevold *et al.*, 2019; Johnston *et al.*, 2018; Morgan and Hunt, 1994; Xue *et al.*, 2018).

From an academic point of view, the gray market is studied through the transaction costs it causes, as well as by the challenges they pose to the strategic design and management of the marketing channel (Antia *et al.*, 2006; Bergen *et al.*, 1998; Yeung and Mok, 2012; Zhao *et al.*, 2021). Therefore, the theoretical basis that explains the phenomenon of the gray market is framed within the Transaction Cost Theory (TCT) (Williamson, 1975). "TCT has emerged as one of the most dominant theoretical paradigms in contemporary business-to-business research" (Rindfleisch *et al.*, 2010, p. 212). This theory states that agents are opportunistic by nature, resulting in higher transaction costs (Williamson, 1985).

The participation of an official distributor in the gray market is always an opportunistic behavior because it is a self-interested breach of the agreements within the official distribution (Bergen *et al.*, 1998; Antia *et al.*, 2006; Zhang and Feng, 2017). This non-compliance seeks a unilateral increase in the revenue share (Wathne and Heide, 2000). Thus, our study presents an explanatory model of the gray market through the participation of official distributors in the gray market as opportunistic behavior (Bergen *et al.*, 1998; Antia *et al.*, 2006). This opportunistic behavior observed affects the performance of official distributors who stick to their agreements, and its impact can be an incentive to join the gray market to defend themselves from the affectation of their business. In other words, opportunistic behavior is caused by the opportunism of the competitors.

Agent opportunism is a source of higher transaction costs due to the need to carefully select (*ex ante* cost) and monitor the relationship (ex-post cost) of the intermediaries involved in the official channel (Williamson, 1975, 1985). The TCT provides a solution to opportunism through the governance of the relationship (Rindfleisch *et al.*, 2010). Thus, our study considers that the manufacturer or brand owner will manage the relationship with its official distributors. In this sense, we consider that the supplier's cooperation with its official distributors is the element of the relationship that best reflects its status (Johnston *et al.*, 2018). Furthermore, the perception of this collaboration by the official distributors will be a key element that they will incorporate into their decisions (Hogevold *et al.*, 2019; Xue *et al.*, 2018). The main contribution of our research is to contemplate a basic relational variable such as cooperation in the study of the gray market, which is traditionally explained from a transactional or market organization perspective (Antia *et al.*, 2006; Cao and Zhang, 2019; Johnson and Sohi, 2016).

We rely on the principles of game theory to justify that official distributors may consider their participation in the unofficial market (Zhang, 2016). So, we will explain the action-reaction of the official distributor in the face of the damage to its performance based on decisions made in a competitive game context along the same lines as in previous works about the affectation of the gray market (Li *et al.*, 2021; Lu *et al.*, 2020). As a second research question, we contemplate the significance of the role the supplier plays. The literature points to the manufacturer or brand owner as being responsible for designing and maintaining the strategy designed for the official distribution channel (Antia *et al.*, 2004). In this sense, we consider that the supplier deploys actions aimed at managing the relationship with its official distributors (John and Reve, 2010), as observed by TCT (Williamson, 1985), and that the presence of a good relationship with its business partners prevents or minimizes their opportunistic behavior (Cao and Zhang, 2019; Morgan and Hunt, 1994; Zhou *et al.*, 2015).

Despite doubts about the efficacy of the relationship in the FMCG sector (Frazier, 1999), we consider that a cooperative relationship supports the performance of business partners, especially within the distribution channel (Xue *et al.*, 2018), and therefore the key variable for assessing the quality of the relationship is cooperation (Hogevold *et al.*, 2019; Johnston *et al.*, 2018; Morgan and Hunt, 1994). The empirical results of our study lead us to believe that the relationship has less influence in the decision of an official distributor to participate in the gray market.

In the following section, we will analyze the literature and justify the hypotheses of the study focused on the decision of the official distributor to participate in the gray market based on two explanatory factors: (1) The negative impact on their business due to the presence of the gray market and, (2) the perceived cooperation of the supplier. Below we present an empirical study using PLS-SEM and comment on the results obtained from which we will draw conclusions, managerial implications and its limitations and recommendations for future research.

2. Literature review and hypotheses

2.1 Literature review

We find in the literature that the gray market is explained by the concept of the official distribution, which is the distribution agreed between the manufacturer and the distributor expressly or tacitly authorized to distribute the product (Gudigantala and Pelin, 2019). These official distribution agreements are associated with the so-called distribution areas, which may be territorial or functional so that the profit share assigned to each channel agent is implicitly agreed upon (Antia *et al.*, 2004). The question is why would a member of the official distribution channel breach its agreements and participate in the gray market? In this sense, Wathne and Heide (2000) point out that opportunism is motivated by searching for a unilateral increase in the share of benefits assigned through agreements or relational norms. Participation in the gray market means, for an official distributor, selling more units or buying cheaper in the short term (Cao and Zhang, 2019). This is a clear benefit for the opportunist.

However, participation in the gray market has pernicious effects. From the manufacturer's point of view, the literature highlights the ineffectiveness of the pricing as the main problem (Zhang and Feng, 2017), demotivation of the official salesforce (Berman, 2004), difficulties in maintaining effective product performance measures and erosion of brand image (Zhao *et al.*, 2016). Nevertheless, the greatest harm that gray distribution does to the manufacturer is the damage it causes to the relations within the official channel (Antia *et al.*, 2006). On the other hand, from the point of view of official distributors engaged in official distribution agreements and standards, the consequence is the loss of their own business (sales, market share and performance) (Berman, 2004). This agent is the most affected since the loss of

income impacts core business. We refer to this affectation as the negative impact of the gray market on official distributors' performance.

The reaction of a distributor that complies with its agreements and has to face competition from the gray market can be daunting. This type of distributor will require the manufacturer to control and act against it (Johnson and Sohi, 2016). The distributor's reaction will be conditioned by the strength of its agreements with the official distribution (Wathne and Heide, 2000), by how its relationship with the manufacturer is affected by the presence of the gray market (Antia *et al.*, 2006), and by how the actions of other official distributors influence it (Watson *et al.*, 2015). Switching to active participation in the gray market is an option. This is our variable and will be explained under the term "active participation of the official distributor in the gray market".

The literature shows opportunism as a deliberate behavior, contrary to the agreements established in the manufacturer-official distributor dyad, "self-interest seeking with guile" (Williamson, 1985, p. 47). The participation of official intermediaries in the gray market is an opportunistic action within the relationship with their official supplier (Antia *et al.*, 2004), which has a negative impact on the performance of official distributors who stand by their agreements (Berman, 2004). To analyze the reaction of an official distributor to the participation in the gray market of another competing official distributor, we resort to game theory. This situation gives rise to a "horizontal channel conflict, also called the level of channel conflict, which is the conflict of interest between the channel members in the identical channel" (Zhao and Long, 2008, p. 456).

In a competitive environment between official distributors with differentiated strategies, the most appropriate non-cooperative equilibrium model is the one shown by the prisoner's dilemma (Nie *et al.*, 2019; Perlman, 2021; Zhang, 2016). The prisoner's dilemma presents a competitor's expectations of a non-cooperative behavior induced by one's own behavior (Nash equilibrium) (Nie *et al.*, 2019). This type of modeling is often used to explore vertical and horizontal marketing channel conflicts (Yan-Bin *et al.*, 2009; Watson *et al.*, 2015; Zhao and Long, 2008) and also for the gray market (Li *et al.*, 2021; Lu *et al.*, 2020; Srivastava and Mateen, 2020). "This is why the establishment of the gray market may be a prisoner's dilemma" (Zhang, 2016, p. 2).

The prisoner's dilemma was initially formulated by Flood and Dresher (1950), and Tucker (1983) later formalized the game by introducing a system of penalties and rewards of a penitentiary nature. With this dilemma, a model of cooperation and conflict arises where the agents may decide not to collaborate even when collaboration maximizes joint interest. Moreover, Axelrod (1984) brought dynamic elements to the prisoner's dilemma by observing successive game interactions where decisions are made based not only on the expectations of each player but also by introducing a scoring system that punishes the agent who does not cooperate. Experimentally, it was found that after a short number of interactions, the decision of both parties was not to cooperate. Based on this proposal, we will adapt the prisoner's dilemma to the analysis of the decisions of the official distributor as a response to the participation in the gray market observed in other members of the official distribution (Figure 2).

As can be seen in Figure 2, for a distribution area where there are two official distributors, the following situations can be observed:

(1) The maximum joint performed is obtained in situation D. Each agent complies with its status as a member of the official channel, and the product is distributed according to the official strategy devised (Busey y Radding, 2006) (Pareto equilibrium).

(2) The maximum individual benefit is observed in situations B and C. One official distributor participates in the gray market, and the other complies with the official agreements. The option to participate in the gray market, while other distributors do not, provides short-term performance due to relational opportunism (Wathne and Heide, 2000).

Official Distributor D1 \ Official Distributor D2	NON-COOPERATE GM Participation	COOPERATE No GM Participation
NON-COOPERATE GM Participation	**(A)** **Maximum Joint Damage**	**(B)** **Maximum Benefit D1 Maximum Damage D2**
COOPERATE No GM Participation	**(C)** **Maximum Benefit D2 Maximum Damage D1**	**(D)** **Maximum Joint Benefit**

Source(s): Own elaboration based on Tucker (1983)

Figure 2. Official distributors' decisions

(3) We also observed a fourth situation (A) where all official distributors participate in the gray market, which is the one with the lowest overall performance (situation A) (Nash equilibrium).

Although a cooperative action is the best (situation D – Pareto equilibrium), the possibility of being harmed by the effects of the gray market when the other member of the network makes use of it may lead the official distributor to switch from not participating (situation B and C) to participating (situation A – Nash equilibrium) in this gray market (Rokkan *et al.*, 2003). In some distribution channels, the adoption of situation A is observed as a reaction to the participation of other agents in the gray market and as the only alternative "to remain competitive" by those affected by parallel imports (KPMG, 2002, p. 17).

The literature shows us the gray market's impact on the official distributor's business. So, "the immediate consequence of the gray market is the loss of a reseller's exclusive or selective right to sell a product" (Berman, 2015, p. 7), cannibalizing the market of authorized channels (Zhao *et al.*, 2016), with the resulting impact on sales volume (Iqbal and Feick, 2002). With these expectations on their performance, the expected reaction is the one shown by the prisoner's dilemma (situation A – Nash equilibrium).

Participation in the gray market and being an opportunistic action (Antia *et al.*, 2006) may be a defense of the competitive position. However, resorting to the gray market has its limits because "Though people are not always completely honest, it is probably too pessimistic to consider them to be always dishonest" (John, 1984, p. 278). This limitation of opportunism leads us to expect a saturation effect of the official distributor affected by the actions of its competitors in the gray market.

The gray market sourcing option is temporary for several reasons. There will be a quality gap because unauthorized distributors' do not provide an adequate level of service, and may lack manufacturer's support (lower quality) because the product was not purchased from an authorized distributor (Altug, 2015). It also implies loss of warranty and service from the legitimate channel (Huang *et al.*, 2004), not obtaining price discounts (Srivastava and Mateen, 2019), brand image erosion (Berman, 2015) and a negative impact on the supply chain relationships (Antia *et al.*, 2006; Berman, 2015; Zhao *et al.*, 2021).

On the other hand, the perception that corrective action may be taken by the manufacturer or brand owner which may consist of "resale restrictions, including fines, litigation, social ostracism, and termination" (Antia *et al.*, 2006, p. 93), can lead the official distributor

concerned to rethink its actions and resort to the gray market less or even the abandonment of this type of action.

The official distributor assumes that the only guarantee of supply is the official channel (Antia *et al.*, 2004). In certain circumstances, the gray market is a source of supply and can be considered a short-term option. The products supplied are vital to the official distributor's business because they are prestigious brands (Zhao *et al.*, 2016). This leads us to consider the presence of a saturation effect, which we base on the fact that after a certain point of gray market participation, it will not continue to intensify its actions within the gray market, regardless of whether the negative impact of its competitors' actions is greater or lesser. This is due to the risk of being detected and excluded from the official network (Antia *et al.*, 2006). "Non-linear relationships imply that the relationship between two variables is not directly proportional, and such non-linear relationships can be either U-shaped or S-shaped (including inverted versions of both shapes)" (Negrão *et al.*, 2020, p. 772).

We also think that the manufacturer-official distributor relationship plays a fundamental role in the official distributor's decision to become involved in the gray market (Coughlan *et al.*, 2006) because "the quality and the configuration of the network relationships play important roles in affecting a distributor's opportunistic tendency" (Zeng *et al.*, 2015, p. 173). Depending on the manufacturer-official distributor relationship profile, the distributor will be more willing to participate in the gray market (Zhang and Feng, 2017). Therefore, the study of the motivation to participate in the gray market should include the level of a negative impact and the manufacturer's management of the marketing channel through the relationship with their official distributors (Mehta *et al.*, 2001).

Cooperation is a key aspect in managing the official channel among the elements included in the relationship between a manufacturer and its official distributors (Hogevold *et al.*, 2019). Cooperation within the distribution channel has been treated from different perspectives. We highlight the absence of conflict, collaborative behavior to achieve common objectives (Xue *et al.*, 2018) and joint efforts toward individual objectives (Hogevold *et al.*, 2019; Zhou *et al.*, 2015), or its study as a phenomenon that promotes flexibility, information exchange, joint problem solving and restriction of the use of power between cooperating agents (Johnston *et al.*, 2018; Lui *et al.*, 2009; Morgan and Hunt, 1994). Behavioral scholars view cooperation from the standpoint of organizational interdependence and joint performance (Xue *et al.*, 2018). The advantages of cooperation are obvious; it minimizes transaction costs and facilitates coordination between the channel partners (Gurcaylilar-Yenidogan *et al.*, 2013), avoids channel alienation (separation from the norms of distribution channel partners) (Gaski and Ray, 2004), invests in an endured relationship (Lui *et al.*, 2009) and establishes a social control mechanism to reduce opportunistic behaviors (Zeng *et al.*, 2015; Zhou *et al.*, 2015).

In the context of our research, we consider that the most useful direction of cooperation for the explanation of the official distributor's decision is the perception of cooperation that distributors in the official network perceive from the channel leader (Mehta *et al.*, 2001). The manufacturer plays the role of leader of the official distribution channel and, in this role, cooperates with its official distributors to improve the exchange and resolve possible disputes (Crosno *et al.*, 2021), thus ensuring the success of the relationship in the long term. The distributor's perception of the manufacturer's cooperation results in less willingness to opportunism (Gurcaylilar-Yenidogan *et al.*, 2013; Johnston *et al.*, 2004; Xue *et al.*, 2018; Zeng *et al.*, 20015), builds trust and makes cooperation more likely to be mutual (Palmatier *et al.*, 2006).

We have already pointed out that participation in the gray market is always an opportunistic action (Antia *et al.*, 2006; Zhang and Feng, 2017). Although opportunism is inherent in inter-firm exchanges (Williamson, 1985), the opportunistic behavior and its toxic impact on exchange outcomes will destroy collaboration and should be controlled (Morgan and Hunt, 1994; Nunlee, 2005; Wathne and Heide, 2000; Yang *et al.*, 2017). According to the relational norms theory (Watson *et al.*, 2015), we argue that high cooperation intensity from

the supplier can enable a social control mechanism to mitigate the distributor's opportunistic behaviors toward the official supply chain (Zeng *et al.*, 2015). When the supplier is cooperative, supplier and distributor will work together in solidarity (loyalty to one another), mutuality (concern for the common good) and harmonious resolution of problems (Yang *et al.*, 2017). In addition, cooperation "has a positive impact on net sales, costs, prices, and ROI" (Mehta *et al.*, 2006, p. 1096). In this situation, alternative solutions to gray market participation can be explored.

Just as we expect cooperation to directly impact a lower willingness of the official distributor to participate in the gray market, we also expect it to have a moderating role on the effect that negative affectation has on the willingness to participate in the gray market and reduce partner disposition to opportunism through cooperation (Xue *et al.*, 2018). This is because "cooperative behaviors lead to the perception that conflict is functional" (Morgan and Hunt, 1994: p. 26). Functional conflict leads to disputes being resolved amicably (Johnston *et al.*, 2018). This implies that in the presence of perceived cooperation from the supplier, the impact produced by the gray market can be treated differently from the participation itself by avoiding the agreements with the official supplier (Wathne and Heide, 2000).

Relationship governance helps to resolve and prevent conflicts (Um and Kim, 2019). So, the perceived cooperation of the official supplier will lead to the impact on its performance of the opportunism of its competitors, causing it to contemplate other options (Morgan and Hunt, 1994; Johnston *et al.*, 2018). The relationship between the competitors' actions and the impact on the performance will be moderated by the perceived cooperation of the official supplier. This moderating effect of relational exchange has been observed in certain distribution channels (Brown *et al.*, 2000). Even in the field of franchising (the official channel has franchise characteristics), it has been established that aspects of the franchisor's (official supplier) cooperation, such as participative communication, act as a moderator between opportunism and impact on performance (Gassenheimer *et al.*, 1996).

2.2 Proposed hypotheses

The literature review leads us to propose hypotheses on how the participation of an official distributor in the gray market may originate. Thus, we propose in the first place the active participation of the official distributors in the gray market (APGM) as a defensive reaction to the negative impact of official distributor's performance by the gray market (NIGM) (as shown in the prisoner's dilemma), which we outlined in the following hypothesis:

H1. The negative impact of the official distributor's performance by the gray market (NIGM) increases the active participation of the official distributor in the gray market (APGM).

Then at some point, increases in the negative impact of gray market (NIGM) (independent variable) begin to lead to increases in the active participation in the gray market (APGM) (dependent variable). "This continues up to a point, when a ceiling effect kicks in, and further changes in the independent variable have no subsequent effect on the dependent variable" (Jaccard and Jacoby, 2010, p. 105). Based on this, we propose the following hypothesis:

H2. The effect of the negative impact of the official distributor's performance by gray market (NIGM) on its active participation in the gray market (APGM) decreases for higher levels of the negative impact of official distributor's performance by gray market (NIGM).

In a situation where the option to stock up in the gray market is present, cooperation can be effective in reducing opportunism (Nunlee, 2005), act as an opportunism-inhibiting force (Xue *et al.*, 2018), encourage mutual interest seeking (Mehta *et al.*, 2006) and discourage self-

interested behavior because "relational norms create a cooperative environment, in which firms self-regulate their opportunistic behavior" (Zhou *et al.*, 2015, p. 151). Against this background, we expose the relationship between the manufacturer's cooperation perceived by the distributor and the distributor's willingness to be opportunistic and resort to the gray market, with the following hypothesis:

H3. The official distributor's perception of the manufacturer's cooperation (COOP) has a negative effect on the active participation of the official distributor in the gray market (APGM).

We have established hypotheses around horizontal non-cooperation (opportunism of a competing distributor), consisting of a Nash equilibrium based on the prisoner's dilemma (Zhao and Yan, 2008). In the case of the manufacturer's perceived cooperation, we are dealing with a vertical relationship in the distribution channel and a cooperative situation. On the other hand, in this case, we analyze whether perceived cooperation plays a moderating role in the impact of the competing distributor's opportunism (Zeng *et al.*, 2015; Zhou *et al.*, 2015).

We propose a moderating effect of the official distributor's-manufacturer's perception of cooperation on the relationship between the negative impact of the gray market and the distributor's participation in the gray market.

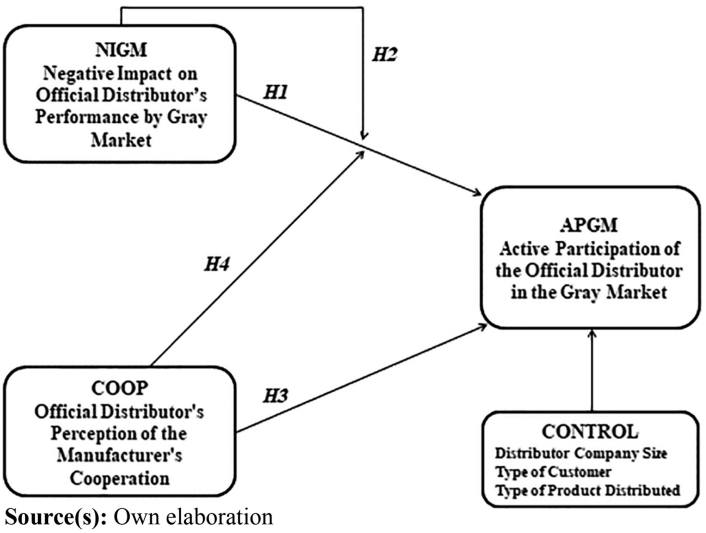
H4. The effect of the negative impact of the official distributor's performance by the gray market (NIGM) on the active participation of the official distributor in the gray market (APGM) is reduced by the official distributor's perception of the manufacturer's cooperation (COOP).

Figure 3 shows graphically the hypotheses proposed.

3. Methodology

3.1 Research design and data collection

Data collection is carried out among Spanish wholesale intermediaries of FMCG products involved in the distribution of branded and high-demand products (48,645 total companies in Spain), a scenario conducive to the incidence of the gray market (Antia *et al.*, 2006; Thomas



Source(s): Own elaboration

Figure 3.
Hypotheses

and Peters, 2006). The key respondent of each company was asked to reply, taking into account the distribution of the goods of the most recognized brands among those they officially distribute.

The survey was conducted online using the University of Murcia's ENCUESTAS application. We sent 4,000 emails to target companies obtained from the INDISA database. INDISA is a managerial publication specialized in Spanish FMCG distribution that offers a database of distributors in a special annual publication (the data provided by INDISA contained contact information for the companies). Wholesale distributors of FMCG products were selected from the database. With the available data, the companies were contacted, requesting the collaboration of their CEO since they have extensive information on the impact of the gray market, both in terms of purchasing (sourcing) and sales (market). From the questionnaire provided by email, 172 valid responses were obtained. The response rate obtained was 4.30%. Control variables were introduced in the questionnaire: Size of the distribution company, type of customer (retail, HORECA or both), and type of product distributed (dry or fresh food, drugstore, etc.).

Before sending the survey, a pre-test was carried out with eight company managers, requesting their opinions on the surveyed concepts: (1) Relevant for what it is measuring, (2) appropriate for the participants and (3) adequate for its purpose. The positive feedback we received in the survey leads us to expect face validity (Hardesty and Bearden, 2004). The survey was conducted in two phases and will be processed with the Partial Least Squares (PLS-SEM) application. To rule out possible non-response bias, we analyzed the phase at which the answers to the questionnaire were provided, dividing the sample by the response phase criterion. The comparison of both subsamples was analyzed using a *t*-test for equality of means, where it was found that there were no relevant differences. These results suggest a low probability of non-response bias (Armstrong and Overton, 1977).

3.2 Measurement scales

The three constructs presented have been measured with a Likert-type scale with seven levels, from 1 = "Strongly disagree" to 7 = "Strongly agree." The questions used in the survey can be found in Table 2.

APGM: To measure the construct active participation of the official distributor in the gray market, our research used four indicators adapted from the literature. These indicators have been previously validated in other studies in the field of gray market and opportunism (Gimeno-Arias and Hernández-Espallardo, 2020). The construct measures the decision to participate in a gray market of a distributor integrated into the official distribution network.

NIGM: Negative impact of gray market on the official distributor's performance was evaluated with a scale of five items based on previous research that showed effectiveness in the perception of opportunistic behavior (Nunlee, 2005). This construct shows how the opportunism of a competing official distributor affects its performance. The scale has been adapted from Nunnle (2005) measuring the disposition to opportunism.

COOP: The measure of the construct official distributor's perception of the manufacturer's cooperation was obtained from Gaski and Ray (2004) using three items. The scales were used to obtain the perception of cooperation. The scale measures the official distributor's perception of the manufacturer's cooperation and whether such cooperation tends to be mutual, using the third item.

3.3 Analytic procedure

In order to guarantee an adequate quality of the results obtained in this explanatory and predictive study, partial least squares structural equation modeling PLS-SEM has been carried out. We consider this approach to be more appropriate than covariance-based SEM

Table 2.
Measurement scales

	Items
APGM	1. Most of the time, sourcing on the gray market is a better choice
	2. You buy merchandise of this brand in gray markets to benefit your customers
	3. It is never a mistake to source from the parallel market
	4. You sell products on the gray market because it is a good, profitable alternative for your company
NIGM	As a result of the gray market [. . .]
	1. Your competitors get better prices than you
	2. Your market share is reduced
	3. Your business loses customers
	4. Your business profitability suffers
	5. You have problems maintaining relationships with regular customers
COOP	Define your relationship with the manufacturer-supplier [. . .]
	1. Generally collaborates with you
	2. Gives you the right help to sell your products
	3. Changes are faced in a cooperative way, working together

Source(s): Own elaboration

(CB-SEM) because our model is made up of three composites (Cepeda-Carrion *et al.*, 2019; Hair *et al.*, 2019). We consider our constructs to be composite because, due to the way the questions have been configured in the survey, we assume a defining relationship between the latent variables and their indicators (Sarstedt *et al.*, 2016). We set three composites in mode A due to the high level of correlation between the indicators that make them up (Rigdon, 2016). Another key reason for choosing this method is that PLS-SEM is suitable for testing nonlinear relationships between constructs (Hair *et al.*, 2018; Sarstedt *et al.*, 2022).

By using SmartPLS 3.3.3 (Ringle *et al.*, 2015), the hypotheses set out in the proposed model have been tested. For this purpose, 10,000 samples were taken in this study through bootstrapping (Streukens and Leroi-Werelds, 2016).

4. Results

The analysis of the model was carried out in five parts. In the first part, the measurement model was analyzed to check the reliability and validity of the measures. In the second part, the structural model was analyzed to check the size and significance of the established relationships. In the third part of the analysis, a study of the existing moderation was carried out. In the fourth part, the non-linear relationship was analyzed. Finally, in the fifth part, an analysis of the model's predictive capacity was carried out.

4.1 Overall model: test of goodness-of-fit (GoF)

Given the confirmatory purpose of our research, we started the analysis of the estimated model by testing several measures of global goodness-of-fit (Henseler *et al.*, 2016; Schuberth *et al.*, 2022). The findings obtained are shown in Table 3. As reported by Schuberth *et al.* (2022), Hair *et al.* (2016) establish that the bootstrap-based test for an exact model fit only has to be applied if the model complexity and sample size support this step. Our model complies with the complexity condition since it is made up of three constructs. However, the sample (172) is below the established limit of 500. Nevertheless, in the literature we can find research using these tests with samples similar to our model, such as Fernández-Gámez *et al.* (2019), Fernández-Gámez *et al.* (2020) and Roldán-Salgueiro *et al.* (2018). For this reason, we consider it appropriate to perform these tests.

To start, the standardized root mean square residual index (SRMR) displays a score of 0.053, which is below the maximum limit established of 0,08 (Hu and Bentler, 1998). Moreover,

using bootstrap-based inference statistics, we have developed several model fit tests (SRMR, dULS and dG). Table 3 shows how under the bootstrap-based 95% (HI95) percentile, all values of discrepancy measures were below the 95% quantile. Therefore, the discrepancy between the empirical and the model-implied correlation matrix is not significant. In addition, the root mean squared residual covariance matrix (RMS_theta) is 0.117, which is close to 0 and less than 0.12 (Henseler *et al.*, 2016). Finally, the normed fit index (NFI) is 0.927, and values above 0.9 usually represent acceptable fit (Hu and Bentler, 1998). Based on the results obtained, the overall goodness of fit of the model is satisfactory (Henseler *et al.*, 2016; Schuberth *et al.*, 2022).

4.2 Assessment of measurement model

To confirm the reliability and convergent validity of the measures, factor loadings, Cronbach's Alpha, composite reliability, the Dijkstra–Henseler rho ratio, the average variance extracted (AVE) has been analyzed (Henseler and Schuberth, 2020). The results are shown in Table 4.

As can be seen, the standardized factor loadings exceed the threshold value of 0.7 (Fornell and Larcker, 1981), with the exception of two values, although these are very close to this

	Estimated model		Saturated model	
	Value	HI95	Value	HI95
SRMR	0.053	0.060	0.053	0.059
d_{ULS}	0.221	0.280	0.219	0.273
d_G	0.060	0.666	0.060	0.666

Note(s): Standardized root mean square residual (SRMR). Unweighted least squares discrepancy (d_{ULS}). Geodesic discrepancy (d_{G})
Source(s): Own elaboration

Table 3. Test of model fit

Composite indicators	Mean	SD	Loading	*t*-student*	Q^2	α	ρA	ρC	AVE
APGM					0.128	0.728	0.837	0.821	0.539
APGM1	2.651	1.882	0.851	31.761	0.292				
APGM2	1.779	1.446	0.782	18.554	0.105				
APGM3	2.763	1.974	0.658	8.396	0.059				
APGM4	1.872	1.343	0.621	8.432	0.059				
NIGM						0.941	0.944	0.955	0.810
NIGM1	3.241	1.975	0.832	31.604					
NIGM2	3.579	2.047	0.933	71.107					
NIGM3	3.487	2.031	0.932	70.599					
NIGM4	3.792	2.074	0.923	59.365					
NIGM5	3.308	1.905	0.875	35.484					
COOP						0.878	0.958	0.923	0.799
COOP1	5.386	1.295	0.933	15.157					
COOP2	5.041	1.403	0.889	15.824					
COOP3	4.380	1.636	0.858	12.014					

Note(s): Significance and standard deviations (SD) performed by 10,000 repetitions Bootstrapping procedure. Q^2: cross-validated redundancies index performed by a 9-step distance-blindfolding procedure. α: Chronbach's alpha; ρA: Dijkstra–Henseler's composite reliability; ρC: Jöreskog's composite reliability; AVE: average variance extracted; ***: All loadings are significant at the 0.001 level
Source(s): Own elaboration

Table 4. Measurement model results

cut-off value. So, the individual reliability of the model has been corroborated. Regarding the reliability of the latent variables, the results for the Cronbach's alpha, composite reliability and the Dijkstra–Henseler ranged from 0.728 to 0.958. These results confirm the reliability of the latent variables. The average variance extracted (AVE) has corroborated the convergent validity. As can be seen, all values exceed the cut-off point set at 0.5 (Hair *et al.*, 2020). These results demonstrate the internal consistency of the latent variables that make up the proposed model.

The Fornell–Larcker criterion (Fornell and Larcker, 1981) has been used to test discriminant validity. According to this criterion, the correlations between each pair of latent variables must not exceed the square root of the AVE of each of the latent variables. This situation is satisfactory in our model, as can be seen from the results of Table 5. Similarly, the findings show that the HTMT level between each two latent variables does not exceed the maximum limit of 0.85 (Henseler *et al.*, 2016). Therefore, the discriminant validity has been corroborated.

4.3 Structural model evaluation and hypotheses testing: analysis of direct effects

We have started the structural model analysis by ruling out the existence of a multicollinearity problem in the model. For this purpose, we have analyzed the variance inflation factor (VIF) results. Table 6 shows all values are under the limit of 3 (Hair *et al.*, 2019). Therefore, multicollinearity is not an issue in this model.

Next to the hypotheses, a one-tailed test of percentile bootstrapping with 10,000 subsamples and a significance level of 10% has been applied. The results are shown in Table 6. As can be seen, a positive and significant relationship between NIGM and APGM is demonstrated as the coefficient linked to this path is $\beta = 0.508$ ($p < 0.01$), verifying H1. On the contrary, the results show that COOP does not affect APGM as the effect found is not significant ($\beta = -0.089$; $p > 0.10$), rejecting H3.

The explanatory capacity of the model has been checked through the R^2 since R^2 is an in-sample predictive power measure (Hair *et al.*, 2019). It shows how the variance of a construct can be explained by the constructs that predict it in the model. The findings show that the variance explained is 29,89% for APGM, above the threshold value of 10% stipulated by Falk and Miller (1992).

Finally, the contribution of each exogenous construct to R^2 values of an endogenous construct has been measured through f^2 (Cohen, 1988). The findings show a small effect of COOP on APGM and COOP on NIGM (0.070 and 0.048, respectively). However, the effect of NIGM on APGM (0.342) is large, demonstrating an important influence of NIGM on APGM.

In order to check for endogeneity problems, the Gaussian copula approach implemented by Park and Gupta (2012) has been developed (García-Pérez-de-Lema *et al.*, 2021). Once it has been verified that the variables susceptible to generating endogeneity problems are non-normally distributed, the Skewness test, the Shapiro–Wilk W test and the Shapiro–French W' test have been carried out for normal data in the scores of the independent variables of the model (COOP and NIGM). As the results obtained show the absence of variables with normal

		I	II	III
I	APGM	*0.734*	0.566	0.205
II	NIGM	0.523	*0.900*	0.224
III	COOP	−0.880	−0.213	*0.894*

Note(s): HTMT ratio over the diagonal. Fornell–Lacker criterion: square root of AVE in diagonal (italics) and construct correlations below the diagonal
Source(s): Own elaboration

Table 5.
Discriminant validity

Table 6. Structural model and hypotheses testing

	Path	SD	*T*-value	f^2	90PCI	VIF	H	Supported
Direct effects								
NIGM > APGM	0.508	0.062	8.464***	0.342	[0.446; 0.605]	1.048	H1	Yes
COOP > APGM	−0.089	0.069	1.126	0.070	[−0.190; 0.012]	1.048	H3	No
Quadratic effects								
NIGM × NIGM > APGM	−0.114	0.075	1.515***	0.026	[−0.206; −0.015]		H2	Yes
Moderating effects								
COOP × NIGM > APGM	0.052	0.068	0.761		[−0.043; 0.129]		H4	No

Note(s): R^2 [90% CI in brackets]: APGM: 0.298 [0.261; 0.384]. Blindfolding Q^2 index as shown in Table 4; Standardized path values reported; f^2: size effect index; 90PCI: 90% percentile Confidence Interval; VIF: Inner model Variance Inflation Factors. Significance, *t*-Student and 90% bias-corrected CIs were performed by 10,000 repetitions Bootstrapping procedure; *: $p < 0.01$; **: $p < 0.01$; ***: $p < 0.001$
Source(s): Own elaboration

distribution, we can continue with the Gaussian copula (Sarstedt *et al.*, 2020). Once the calculations have been carried out, Table 7 shows that the effect of the Gaussian copula does not produce a significant equation, thus ruling out problems of normality.

Moreover, control variables such as company age or size have been introduced into the model to rule out the existence of endogeneity derived from having omitted variables in explaining the dependent variable (Hair *et al.*, 2021). The results obtained confirm that the control variables have no effect on the explained variable, so we can conclude that the omitted variables are controlled in this model (Antonakis *et al.*, 2014).

To complete the analysis of the structural model, an evaluation of the predictive relevance of the endogenous variables (NIGM and APGM) has been carried out. For this purpose, we carried out the Q^2 statistical test (a cross-validated redundancy index) (Ringle *et al.*, 2012) through the blindfolding method using SmartPLS. The findings (Table 4) show that all values are positive, demonstrating an adequate predictive relevance of the model (Evermann and Tate, 2016). However, considering that both Q^2 and its related "effect size" Q^2 are ad hoc metrics that do not provide highly interpretable results in terms of prediction error magnitude (Shmueli *et al.*, 2016), Section 4.5 will analyze the predictive performance through PLS predict.

4.4 Assessment of nonlinear effects

One of the advantages of working with PLS-SEM is its ability to analyze models with nonlinear effects (Basco *et al.*, 2021). In order to test hypothesis 2, we have extended the model proposed with a nonlinear effect with quadratic functions between NIGM and APGM. With this purpose, on the basis of theoretical knowledge, we applied a negative quadratic interaction term with a positive linear effect in this relationship and adopted the two-stage approach for model estimation since the objective is to determine the statistical significance of the nonlinear effect (Hair *et al.*, 2014; Sarstedt *et al.*, 2020).

The findings show that the linear effect of NIGM on APGM increased from 0.508 (Table 6) to 0.524. The f^2 effect size is 0.026, which is a large effect, according to Kenny (2015). Similarly, the results showed that the interaction term had a significant ($p < 0.10$) and negative direct effect on APGM. An increase in NIGM by one standard deviation unit decreased the relationship with APGM by 0.114 (i.e. from 0.458 to 0.325). Therefore, we can affirm that the relationship between APGM and NIGM decreases exponentially for higher levels of APGM. Additionally, we checked the f^2 effect sizes of NIGM-APGM; the value of 0.354 corroborates a strong effect (Basco *et al.*, 2021). Therefore, H2 is accepted.

4.5 The moderation analysis

The above results show H4 is not supported as the moderating effect of COOP on the relationship between NIGM and APGM ($\beta = 0.052$; $p > 0.10$) which is insignificant.

4.6 Evaluation of predictive performance

The model's predictive performance has been assessed through cross-validation with holdout samples (Shmueli *et al.*, 2016) by applying the PLS Predict algorithm with SmartPLS

Table 7. Gaussian copula approach

Relationship	Model	Path β	Path t	Copula β	Copula t
APGM ← COOP	1	−0.18	−2.37***		
APGM ← COOP	2	−0.20	−3.12***	−0.22	−0.44
APGM ← NIGM	1	0.52	8.01***		
APGM ← NIGM	2	0.72	3.37***	−0.27	−0.39

(Shmueli *et al.*, 2019). This refers to the model's ability to predict future observations (Shmueli *et al.*, 2019). Predictive validity demonstrates that a set of measures of a variable can predict a given outcome variable.

Firstly, a k-fold cross-validation was executed, setting $k = 5$ subgroups to find the minimum size of $N = 30$ for the holdout sample (Hair *et al.*, 2019), with 10 repetitions of the procedure. Furthermore, a PLS predict analysis was applied in the model (Calvo-Mora *et al.*, 2020).

The findings in Table 8 reveal that in both indicator and construct levels, all the Q^2 values are higher than 0. These results demonstrate that the model has an adequate predictive performance (Felipe *et al.*, 2017). Furthermore, if we compare the results for RMSE and MAE of PLS-SEM with those obtained in the linear regression model, the results obtained show that in most cases, PLS-SEM obtains a lower forecast error and a higher Q^2.

It has been found that all the values of the prediction errors are highly symmetric since their kurtosis in absolute value is less than 1, in such a way that RMSE was selected as a basis of the predictive power assessment (Shmueli *et al.*, 2019), although MAE is also shown. With these results, we can affirm that the proposed model improves the predictive performance of the available indicator data (Felipe *et al.*, 2017).

5. Discussion

The research question we pose is: Can the gray market share of FMCG wholesale distributors be explained by a model of vertical and horizontal cooperation in the distribution channel? In a gray market context not studied to date, official wholesale distributors in the FMCG supply chain where we introduce official supplier–distributor relationship as an element of the study.

The damage caused to its performance by the opportunistic actions of its official distributor competitors (horizontal non-cooperation) drives it to participate in such business (confirmed Hypothesis H1). Participation in the gray market provides short-term benefits (Antia *et al.*, 2004), and is a defense formula against the initiative of other official distributors, as we have seen in the prisoner's dilemma game (Axelrod, 1984; Tucker, 1983). The impact found in the participation of other official distributors as an incentive to participate in the gray market has a saturation point (confirmed Hypothesis H2). The empirical study shows a level of affectation where the incentive to participate in the gray market decreases. In these cases, the expected corrective actions by the manufacturer may lead to exclusion from the official network (Antia *et al.*, 2006). One of the measures proposed by TCT to prevent

Construct prediction summary									Q^2
APGM									0.019
	RMSE	PLS MAE	Q^2	RMSE	LM MAE	Q^2	RMSE	PLS-LM MAE	Q^2
APGM1	1.888	1.617	0.006	1.898	1.619	−0.005	−0.010	−0.002	0.011
APGM2	1.437	1.040	0.026	1.445	1.017	0.015	−0.008	0.023	0.011
APGM3	1.979	1.684	0.010	1.975	1.644	0.014	0.004	0.040	−0.004
APGM4	1.351	1.011	0.005	1.365	1.008	−0.016	−0.014	0.003	0.021

Note(s): PLS: partial least squares path model; LM: linear regression model; RMSE: root mean squared error; MAE: mean absolute error. Q^2: PLS-predict index performed with 5 k-fold and 10 repetitions
Source(s): Own elaboration

Table 8. PLS Predict assessment

opportunistic behavior of agents is a careful and meticulous selection of business partners (Wathne and Heide, 2000; Watson IV *et al.*, 2015). This situation leads the official intermediary to limit itself in its participation in the gray market due to the risk of exclusion that a channel immersed in chaos entails.

The rejection of relational hypotheses (Hypotheses H3 and H4 not supported) leads us to address a debate that has not been discussed in depth in the extensive relational literature. In our opinion, the importance of the relationship in distribution channel management is conditioned by the type of sector. Frazier (1999) points out that the relationship has disparate effects on the management of the distribution channel depending on the sector, providing minimal impact in the field of FMCG channels. The studies that have shown us the effectiveness of the relationship are focused on sectors such as independent automobile tyre retailers (Morgan and Hunt, 1994), distributors of household furnishings (Yang *et al.*, 2017), car dealers (Zeng *et al.*, 2015), electronic products and components, machinery equipment (Zhou *et al.*, 2015), hotel industry (Brown *et al.*, 2000), electronics and electrical metal, mechanical and engineering (Chae *et al.*, 2017), plant and machinery and associated equipment, electronics, chemicals and software (Sharma *et al.*, 2015). However, we found no studies that have specifically addressed the effectiveness of relationships in the FMCG distribution channel. This situation leads us to think that their role in the management of these distribution channels is less relevant and that they have a secondary role in the management of these channels, "attitudes and behaviors are motivated and formed on a cost-benefit analysis basis" (Johnston *et al.*, 2018, p. 679).

On the other hand, Sharma *et al.* (2015) point out that the effectiveness of the relationship is contingent on, and in no case replaces, optimal business performance. So, the relationship is only relevant if the organization of the channel is satisfactory for the agents that develop their business within it. This is reinforced by Macneil (1978), who sees the relationship as subordinate to the contractual agreement and not as a substitute for it. In this sense, Crosno *et al.* (2021) point to the relationship as a complement of the contract or agreement (exclusive sourcing through the official channel) in the governance of the channel. The exchange relationship has weaker effect sizes of contracts (Crosno *et al.*, 2021).

6. Conclusions

6.1 Theoretical implications

The literature shows that the gray market is one of the most important problems facing an official distribution channel strategy for prestige products. The problems caused by this presence can be observed in the appearance of opportunistic behavior by some of the agents involved. This opportunism is a consequence of the search for higher short term profits, as opposed to those initially assigned in the distribution function. The increase in their share of profits has a negative impact on the performance of those intermediaries that choose to maintain their agreements. This negative impact leads them to question the order established in the official distribution channel and is an incentive to participate in the gray market. However, this participation is limited by the possible action that the manufacturer may take through exclusion from the official distribution network. When participation in the gray market is at a high level, it leads to the question of whether maintaining this line of action may have irreversible consequences, and it is a disincentive to maintain this participation.

On the other hand, the relational literature points to the fact that the management of the exchange relationship contributes to the success of agreements and the prevention of opportunism. In sectors such as the FMCG, we find no evidence of the role of the relationship. In our opinion, the relationship is subordinate to the smooth functioning of the agreements. Only when the contracts established in the official distribution channel of FMCG products are successful can the relationship contribute to strengthening these agreements.

6.2 Practical implications

The results obtained lead us to concrete recommendations at the corporate level. The presence of the gray market requires taking collective, specific and forceful actions to defend the profit share of each of the agents involved in the official distribution channel. This avoids the adoption of individual actions to defend performance. The control of gray market participation must be in the hands of the official supplier, showing signs of punishment (exclusion from the official network, loss of the advantages of distributing an official product, loss of warranty, [. . .]). The enforcement has shown effectiveness in the management of the gray market (Antia *et al.*, 2006). In this way, the saturation point will be lower, and participation in the gray market will be sporadic or non-existent. This situation will protect the performance of official intermediaries.

Despite the low effectiveness shown by the relationships in the distribution channel studied, the literature shows that good business relationships reinforce the agreements (Crosno *et al.*, 2021; Macneil, 1978). Therefore, we recommend that cooperative relationships accompany these agreements. Although the relationships do not prevent the consequences of the most severe non-compliances, they facilitate the joint resolution of contingencies with less impact on performance.

6.3 Limitations and future research

As a limitation of our study, we would like to emphasize that only one dimension was used to measure the impact of the relationship: The manufacturer's cooperation perceived by the official distributor. In the authors' opinion, this single measure is a limitation in our research, which we believe should be completed with multidimensional studies of the relationship (satisfaction, trust and commitment). Despite not having found evidence of the deterrent effects of the relationship in itself in the prevention of opportunism, the literature has pointed to its governance as an effective tool. It may become a factor that determines the importance of the relationship as a preventive option in the management of official distribution.

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