The Reference Group as Antecedent of Gray Market Participation: An Empirical Analysis

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ABSTRACT

Purpose: The objective of this research is to analyze the motivation of a distributor belonging to an official marketing channel to participate in the gray market. We explore this motivation not as an opportunistic behavior but as a strategic decision aligned with the reference group to which it belongs and the homogenization or isomorphism of strategic decisions within the group.

Methodology/Approach: Based on a survey of a sample of Spanish official distributors of Fast-Moving Consumer Goods (FMCG) and an empirical study using PLS-SEM, found evidence that the imitation effect conditions strategic decisions and can be graduated according to the hierarchical position occupied or legitimacy within the reference group.

Findings: The hypothesized model was supported by the data. This indicates that the reference group influences the agents that make it up and determines the actions expected of its members, offering a tool to the manufacturer or brand owner to manage the official distribution channel.

Originality/Value: The investigation of the effect of the reference group on the behavior of the official distributor offers an alternative to the classical explanation of its participation in the gray market, which has not been addressed by the academic literature so far, and which has traditionally been explained by the individual opportunism of the agents.

Practical implications: The main managerial implication is to provide a monitoring element to the official distribution channel leader, such as influencing the behaviors of the reference group to efficiently manage the marketing channel.

Introduction

The academic literature on marketing channels has attached particular importance to a problem faced when segmenting its various markets, the gray market (Antia et al. 2006; Antia, Bergen, and Dutta 2004; Berman and Dong 2016). However, no solution has been provided to avoid or limit the problem. On the contrary, the gray market remains one of the main problems in the design of a multichannel strategy because it disrupts a basic strategy such as pricing (Evans, Starr, and Brodie 2019; Zhao, Jiang, and Sun 2021). Moreover, it is also a growing problem at the present time, as there are elements that contribute to it, such as ICT, e-commerce, globalization of trade, or global logistic network (Lu et al. 2020; Zhang and Feng 2017; Zhao, Zhao, and Deng 2016).

When manufacturers or owners of prestigious brands market their products, they design an official distribution channel to maximize revenues and preserve their brand image (Gudigantala and Bicen 2019). The strategic design of the official marketing channel is based on multichannel distribution, establishing different channels according to market segmentation (Zhao, Zhao, and Deng 2016). The strategy consists of discriminating prices according to the elasticity of demand, purchasing power, competitive conditions, price discount, geographic areas, customer heterogeneity, or market regulations (Antia, Bergen, and Dutta 2004; Bicen and Gudigantala 2014; Evans, Starr, and Brodie 2019; Zhang and Feng 2017). This situation results in the same product being available at different prices (Cao and Zhang 2020; Zhang 2016) and the possibility of the emergence of gray markets through the intervention of intermediaries outside the official network who buy products in the cheaper market segments and sell them in the more expensive ones (Gudigantala and Bicen 2019). One of the examples of the gray market is parallel imports, where due to

the competitive situation or legal regulation, the same product has different prices in each country (Berman 2004; Berman and Dong 2016; Bicen and Gudigantala 2014; Lu et al. 2020).

The literature shows numerous examples of gray market incidence in various sectors. For example, through parallel imports, a flow of prestigious branded products is found from countries where the product is cheaper to higher-priced countries (Cao and Zhang 2020; Gudigantala and Bicen 2019; Zhang, Jiang, and Zheng 2023). So, the products are channeled through gray intermediaries outside the official network (Antia et al. 2006; Jiang et al. 2020). In this way, in the marketing channel of Fast-Moving Consumer Goods (FMCG) Gimeno-Arias and Santos-Jaén (2022) and Li, Shao, and Zhu (2020) observe a significant gray market in soft drinks (Coca-Cola), both in Europe and Asia. It is also observed in luxury goods (watches, jewelry, or perfumes) (Huang, He, and Chen 2020; Wang, Lin, and Choi 2020; Zhang, Jiang, and Zheng 2023), cell phones (Jiang et al. 2020), the pharmaceutical industry (Li, Shao, and Zhu 2020), fashion, automobile, electronics, computer hardware, or textbooks (Srivastava and Mateen 2020).

The gray market is conducted without the authorization of the manufacturer or brand owner (Antia et al. 2006; Jiang et al. 2020). However, its origin is necessarily that of an agent of the official network since they are the only ones who have the product available (Gimeno-Arias and Hernández-Espallardo 2020; Srivastava and Mateen 2020). This places the gray market as an opportunistic action by one or more members of the official distribution in breach of their agreements to keep their business within the official marketing channel (Antia et al. 2006; Bergen, Heide, and Dutta 1998; Gimeno-Arias and Santos-Jaén 2022; Zhao, Jiang, and Sun 2021).

Opportunism in business has been defined as "self-interest seeking with guile" (Williamson 1975, 6), which includes the exploitation of the relationship for their own benefit (Wathne and Heide 2000), restriction of value creation due to insufficient cooperation (Morgan and Hunt 1994), or the erosion of the results of the exchange (Hawkins, Wittmann, and Beyerlein 2008). In the marketing channel, opportunism is a usual behavior (Grzeskowiak and Al-khatib 2009; Mysen, Svensson, and Payan 2011) that surfaces due to the complexities of human behavior in exchange relationships where parties find advantages in maximizing their own benefit to the detriment of the exchange partner (Xue et al. 2018), due to the increasing competition in this area of business activity (Gould, Liu, and Yu 2016).

In the managerial field, the gray market greatly impacts official network business. Some authors point out examples that suggest their magnitude. For example, Zhang et al. (2020) estimate that 20% of medicines sold in the UK are parallel imports or 1.4 million iPhones are sold abroad through unofficial distribution networks. In Malaysia, sales of cell phones in the gray market account for 70% of sales (Li et al. 2016). Worldwide estimates also put the gray market business at around $58 billion (Gudigantala and Bicen 2019). The main loss to the manufacturer or brand owner arises from higher sales in lower margin channels (Cao and Zhang 2020; Zhang, Jiang, and Zheng 2023). For official distributors, this means a loss of sales, especially for those operating in the higher-priced markets (Gimeno-Arias and Hernández-Espallardo 2020). In global terms, the damages produced by the gray market to the official network are: a) unauthorized products cannibalize the market share of authorized goods, which decreases market efficiency (i.e., cannibalization effect) (Huang, He, and Chen 2020; Li, Shao, and Zhu 2020), b) products are available everywhere, which corrodes brand image (Wang, Lin, and Choi 2020), and c) manufacturers have to make more efforts to monitor and control channels to combat gray market activities (Antia et al. 2006; Antia, Bergen, and Dutta 2004; Cao and Zhang 2020).

The pandemic situation caused by COVID-19 has led to an increase in the e-commerce business. This type of transaction increases the incidence of the gray market because e-commerce favors information and accessibility to price differentials for the same product (Zhang and Feng 2017; Zhao, Zhao, and Deng 2016). This is why we are facing a foreseeable increase in the gray market at the international level (Zhao, Jiang, and Sun 2021).

From an academic point of view, the gray market has been studied as a source of higher

transaction costs in marketing channel management (Bergen, Heide, and Dutta 1998) due to the consideration that opportunism is a basic behavioral assumption in the business (Williamson 1975, 1985). Instead, transaction costs arise from the need for careful selection of the exchange partner (ex-ante) and the need to monitor their actions (ex-post) (Wathne and Heide 2000). For this reason, the paradigm that serves as a framework for its study has been the Transaction Cost Theory (TCT) (Antia et al. 2006; Bergen, Heide, and Dutta 1998). However, we believe that one possible origin of the gray market may not be opportunism per se and can be established as a business strategy not been studied to date.

It is necessary to study the origin of the gray market to provide solutions to optimize the efficient marketing channel management. The academic literature has studied it almost exclusively from a pricing strategy and opportunistic behavior perspective (Antia et al. 2006; Berman and Dong 2016; Zhang, Jiang, and Zheng 2023; Zhao, Jiang, and Sun 2021). However, we consider that although its origin is based on the price differential at which certain products are marketed, there are elements that have a catalytic function, such as the strategic imitation effect in a homogeneous group that develops similar behaviors (Chung et al. 2011; Haas and Park 2010; Siguaw, Simpson, and Baker 1998), particularly in the distribution channel (Dacin, Oliver, and Roy 2007). This leads to locating Knowledge Gap (Jacobs 2011; Miles 2017; Müller-Bloch and Kranz 2014).

On the other hand, multinational companies operating in the FMCG channel are affected in their margin strategy because their price discrimination is threatened (Antia et al. 2006; Bicen and Gudigantala 2014; Cao and Zhang 2020; Li, Shao, and Zhu 2020; Zhao, Zhao, and Deng 2016). This is especially noticeable in business-to-business because pricing strategies are agreed upon with the product's intermediary companies (Berman 2004; Gimeno-Arias and Santos-Jaén 2022; Lu et al. 2020). This leads us to approach the investigation not only from the point of view of the gap-spotting but also from the perspective of the Problematization Methodology (Alvesson and Sandberg 2011) to offer comprehensive solutions for FMCG's distribution channel management, from an academic and managerial perspective.

We present a novel academic explanation of the participation of an official distributor in the gray market, not as an opportunistic action but as a strategic option. The initial intention of an official distributor is to comply with its agreements to keep its business within the official distribution channel (Antia et al. 2006; Bicen and Gudigantala 2014; Gudigantala and Bicen 2019; Zhao, Zhao, and Deng 2016). Nevertheless what happens if this agent observes that other official agents have adopted gray market participation as a strategy to improve their performance? The official distribution channel is configured as a reference group where agents share the same norms and values (Dacin, Oliver, and Roy 2007; Hult 2011; Siguaw, Simpson, and Baker 1998). Therefore, when one or more of these agents break away from the channel's strategy, other agents will follow or imitate them (Chung et al. 2011; Haas and Park 2010; Hult 2011). The framework that best explains the uniformity and imitation of the strategy is the Reference Group Theory (Kelley 1965; Shibutani 1955; Siguaw, Simpson, and Baker 1998). Although it was originally a theory of sociological behavior (DiMaggio and Powell 1983; Kelley 1965; Shibutani 1955), it has been developed in the explanation of the behavior of the agents that make up the distribution channel (Chung et al. 2011; Liu et al. 2015), "Kelley (1965) suggest that reference group influences also can affect the channel relationship" (Siguaw, Simpson, and Baker 1998, 101).

In the following section, we will establish the theoretical framework that will support the proposed hypotheses. We will then present an empirical analysis based on a sample of Spanish distributors of Fast-moving consumer goods (FMCG). Finally, we will present conclusions.

Literature review and hypotheses

There is a broad consensus in the literature that the origin of the gray market is a price differential that favors arbitrage between markets (Antia et al. 2006; Antia, Bergen, and Dutta 2004; Berman 2004; Berman and Dong 2016). Table 1 shows the most relevant empirical and analytical studies of the gray market in the last years. As can be seen, the studies

Table 1. Studies analyzed on the gray market and its origins.

Study	Gray Market origin	Type of research
Antia, Bergen, and Dutta (2004)	Price differential, premium positioning, product scarcity, free-riding potential, customer heterogeneity	Descriptive analysis
Antia et al. (2006)	Price differential, premium positioning, product scarcity, free-riding potential, customer heterogeneity	Psychometric (Branded personal care products)
Bergen, Heide, and Dutta (1998)	Performance ambiguity, exclusive dealing, dual distribution, distributor Services, product maturity	Psychometric (Companies in SIC 35 and SIC 36)
Berman (2004)	Price differential	Descriptive analysis
Berman and Dong (2016)	Price differential	Literature review
Bicen and Gudigantala (2014)	Price differential	Descriptive analysis
Cao and Zhang (2020)	Price differential	Game-theoretic approach
Gudigantala and Bicen (2019)	Consumers ethical norms	Experimental design (multiple scenarios)
Huang, He, and Chen (2020)	Price differential	Game-theoretic model
Jiang et al. (2020)	Price differential	Backward induction
Li, Shao, and Zhu (2020)	Price differential	Game-theoretic model
Li et al. (2016)	Price differential	Game-theoretic model
Lu et al. (2020)	Price differential	Game-theoretic approach
Srivastava and Mateen (2020)	Price discrimination strategy	Comparative performance analysis
Wang, Lin, and Choi (2020)	Price differential	Literature review
Zhang (2016)	Price discrimination	Game-theoretic approach
Zhang, Jiang, and Zheng (2023)	Price discrimination	Stackelberg games
Zhang and Feng (2017)	Price differential	Pricing model
Zhao, Jiang, and Sun (2021)	Price strategy	Literature review using data-driven approach
Zhao, Zhao, and Deng (2016)	Price gap	Internet retail website

Source: Own elaboration.

emphasize the price differential as the origin of actions in this type of market. However, we consider that the price differential is a necessary condition, but it may not be sufficient if other motivators do not accompany it. Moreover, additional causes that have not been studied must be considered because the gray market can also be a strategic choice. On the other hand, psychometric studies in relevant sectors of economic activity (such as FMCG) have been very scarce. However, we believe that the opinions of the companies involved or with the potential to become involved in the gray market are essential for research in this area.

The gray market originates with an exercise of opportunism of an official member that does not comply with its agreements and decides to do business in an unofficial market (Antia, Bergen, and Dutta 2004; Cavusgil, Deligonul, and Zhang 2004; Johnson and Sohi 2016). These deals can be purchased or sold to gray agents (Zhao, Zhao, and Deng 2016). It should be noted that a gray intermediary only obtains a product from a member of the official distribution (Gimeno-Arias and Hernández-Espallardo 2020). Therefore, the gray market will originate from an agent in the official network.

However, in addition to opportunism, participation in the gray market is a strategy to buy cheaper or sell more quantity and improve margins and/or profits (Cao and Zhang 2020) because the purpose of any strategy is to improve the company's performance (Michael 1980). Moreover, this type of strategy can be adopted by the official distributor and the official supplier when it needs timely additional sales to which it does not have access through the official distribution channel (Antia, Bergen, and Dutta 2004). Therefore, in order to understand the motivation of an official channel intermediary to do business with the gray market, we will study its opportunism (Antia et al. 2006; Bergen, Heide, and Dutta 1998), which we understand as noncompliance with its agreements with the official channel. But not as a basic behavioral assumption (Williamson 1975, 1985) but as a performance improvement strategy.

Opportunistic behavior has been treated in two different ways in the literature, as an explanatory or exogenous variable (Wathne and Heide 2000) or as an explained or endogenous variable (Sheng et al. 2018). In our study, the opportunism to be explained is the participation of the official distributor in the gray market. It will receive endogenous treatment, in line with

works that have studied opportunism in this way (see Table 2). The question raised is what motivates the opportunism of an official distributor in its participation in the gray market. This opportunism takes the shape of breach of agreement, concealment of data, misleading transactions, false promises, concealment of information, or unfair competitive practices (Paswan 2009).

In the context of our study, the opportunism involved in gray market participation is explained by imitating the strategy of other members of official distribution (Siguaw, Simpson, and Baker 1998). The official distribution channel is a strategic group within the distribution channels, constituting a voluntary alliance or relationship between its members (manufacturer or brand owner and official distributors) (Antia, Bergen, and Dutta 2004). Within this strategic group, short- and long-term behaviors are regulated by coordination and contractual or social agreement of its members (Dacin, Oliver, and Roy 2007). This strategic partnership forms a homogeneous group that gives them the identity of a reference group because their components share norms and values (Chung et al. 2011; Siguaw, Simpson, and Baker 1998). A reference group is "some identifiable grouping to which an actor is related in some manner and norms and values are shared in that group" (Shibutani 1955, 562). The reference group serves as a guide for the conduct and behavior of its members (Haas and Park 2010). Thus, the comparative function is for members of the official distribution to proactively examine the behaviors and standards of the reference group to guide their own behaviors (Chung et al. 2011).

Reference groups are the result of the institutionalization of the members of a strategic group, defined as "the processes by which structures, including schemas, rules, norms, and routines, become established as authoritative guidelines for social behavior . . . it inquiries into how these elements are created, diffused, adopted, and adapted over space and time" (Hult 2011, 518). This institutionalization process is important for official distribution because it facilitates decision-making, communication, joint projects, corporate intelligence, and the security of its members against external aggressions to the network (Trim and Lee 2006). It is a process that starts from the voluntary nature of its members. The decisions taken in this area are driven by a social justification that corresponds to the desire of the actors to be accountable for their actions (Dacin, Oliver, and Roy 2007).

The objective of institutionalizing the members of the official distribution is to create similar structures among its components so that behaviors are aligned with the official distribution strategy by adopting a common response to the environment, which is known as isomorphism, and defined as "a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions" (DiMaggio and Powell 1983, 149). Transferring this definition of sociological origin to the official distribution channel environment, we find that isomorphism is the result of institutional pressure that forces organizations in the same environment or channel to adopt similar characteristics or forms (Dacin, Oliver, and Roy 2007). The adoption of isomorphism by the strategic group that makes up the official distribution is aimed at legitimacy, defined as the generalized perception that actions as a member of the official network are desirable and appropriate within the group's system of social norms, values, and beliefs (Suchman 1995). Legitimacy, as opposed

Table 2. Studies of opportunism as an endogenous variable.

Study	Endogenous variable	Exogenous variables
Antia et al. (2006)	Gray market incidence (opportunism)	Enforcement, price differential, prestige, scarcity, free-riding, customer heterogeneity
Das and Rahman (2010)	Opportunism business partner	Economic, relational, and temporal factors
Jap and Anderson (2003)	Opportunism ex-post	Idiosyncratic assets, target congruence
Morgan, Anokhin, and Wincent (2016)	Opportunism	Entrepreneurship, market power
Mysen, Svensson, and Payan (2011)	Opportunism	Environmental uncertainty, structural linkage
Paswan (2009)	Opportunism	Competitive severity, unfair competitive practices
Sheng et al. (2018)	Opportunism	Institutional factors, governance
Wang et al. (2013)	Opportunism	Transaction costs, equity capital
Wang and Yang (2013)	Opportunism	Environmental factors, relational factors, organizational system
Xue et al. (2018)	Opportunism	Trust, cooperation
Yang, Qian, and Zheng (2017)	Opportunism	Contracts, relational rules

Source: Own elaboration.

to concepts such as reputation or institutional prestige, is a broader term that explains how and why the structure of the company and its activities are configured to conform to social norms and values (Dacin, Oliver, and Roy 2007).

Thus, the official network is a group of agents (manufacturer or brand owner and official distributors) that share a common strategy, which gives them the identity of a reference group (Haas and Park 2010). In this group, norms are established, whether formal or relational, as well as pressure to institutionalize its members and obtain from its members a common and similar response or behavior, called isomorphism (Dacin, Oliver, and Roy 2007), that members of the official channel adopt in order to gain legitimacy from the reference group to which they belong (Hult 2011; Trim and Lee 2006).

In these circumstances, an exercise of opportunism through the intervention of a member of the official distribution in the gray market, either by an official distributor (Antia et al. 2006) or by the manufacturer or trademark owner (Cao and Zhang 2020), assumes a response from the other members of the network that is expected to be isomorphic (Dacin, Oliver, and Roy 2007), imitating these behaviors (Chung et al. 2011). This reasoning leads to the following hypotheses:

H1: The Gray Market Participation of an official distributor (GMP) is positively influenced by Other official Distributors' Participation in the Gray Market (ODPGM).

H2: The Gray Market Participation of an official distributor (GMP) is positively influenced by Manufacturer Participation in the Gray Market (MPGM).

It is perhaps too pessimistic to expect opportunistic actions at all times (John 1984). Therefore, an additional question is whether the imitation effect of the opportunism of other official agents is unlimited. Studies in sociology show that opportunistic behavior "is a joint result of personal individuality, situational factors, and social interaction, not only determined by personal morality" (Liu et al. 2015, 596). However, there is evidence that continued opportunistic behaviors can lead to the termination

of the relationship and exclusion from the official network (Antia et al. 2006). Therefore, when an official distributor decides to participate in the gray market following the actions of other official agents, there will be a dichotomy between doing so indefinitely or limiting it depending on environmental circumstances (Chung et al. 2011; Siguaw, Simpson, and Baker 1998).

On the other hand, we believe that the imitation effect within the reference group will vary depending on the role played by the imitated agent within the group (Haas and Park 2010). Thus, "when channel power is imbalanced, the party with more power will be a reference group for the party with less power" (Chung et al. 2011, 16). For example, in an official distribution channel, the power and leadership are held by the manufacturer or brand owner because it is the only one that can guarantee a continuous supply of the product (Gimeno-Arias and Hernández-Espallardo 2020). This is why strategic imitation will be unlimited when imitating the channel leader (Chung et al. 2011) because the supplier exerts greater influence on distributors (Siguaw, Simpson, and Baker 1998). In contrast, imitation of another agent in the channel will be conditioned by the actions that the leader's actions to punish the opportunism of his official intermediaries (Antia et al. 2006).

Against this background, we posit a non-linear saturation effect in imitating the opportunism of other official distributors. The risk of being excluded from official distribution by the actions taken by the supplier (Antia et al. 2006; Antia, Bergen, and Dutta 2004) will limit the action of participating in the gray market by following other distributors belonging to the reference group because they have less legitimacy (Dacin, Oliver, and Roy 2007). This situation is reflected in the following hypothesis:

H3: The effect of Other official Distributors' Participation in the Gray Market (ODPGM) on the Gray Market Participation of an official distributor (GMP) decreases for higher levels.

In the same way that an official distributor will limit its participation in the gray market when the action comes from the imitation of other official distributors versus when it comes from the supplier, we should expect that the influence exerted by the different

agents will not be equal (Chung et al. 2011; Haas and Park 2010; Siguaw, Simpson, and Baker 1998). The official distributor limits its participation in the gray market when it imitates other official distributors due to the possibility of corrective actions by the supplier (Antia et al. 2006; Antia, Bergen, and Dutta 2004). However, gray market participation through supplier imitation will have an unlimited effect because such supplier actions have greater legitimacy in the reference group (Dacin, Oliver, and Roy 2007), and corrective actions are not expected.

This leads us to conclude that the participation of the manufacturer or brand owner in the gray market has a greater effect on the official distributor than when the origin of its participation is the imitation of other official distributors (Chung et al. 2011; Haas and Park 2010). This is because the official distribution channel has been strategically designed by the manufacturer or brand owner (Cao and Zhang 2020; Evans, Starr, and Brodie 2019; Gudigantala and Bicen 2019). Its status as the channel leader makes it take measures to maintain the implemented strategy, which includes the necessary actions to enforce it (Antia et al. 2006). This situation gives greater legitimacy to the supplier's actions within the official channel (Dacin, Oliver, and Roy 2007). Therefore, an official distributor will be more willing to participate in the gray market when its origin is the supplier's participation (Chung et al. 2011). This reasoning is reflected in the following hypothesis:

H4: The Gray Market Participation of an official distributor (GMP) is more influenced by Manufacturer Participation in the Gray Market (MPGM) than by Other official Distributors' Participation in the Gray Market (ODPGM).

Methodology

Research design and data collection

The research is carried out in the distribution channels of FMCG products. This marketing channel is characterized by implementing an official distribution system where the different market segments are managed. As a results, revenues are optimized according to the geographic area or type of customer targeted (Andaleeb 2016; Goyat 2011). In this type of market, the positioning of the brand in each segment conditions the manufacturer's performance and is an incentive for the emergence of gray markets (Antia et al. 2006; Zhao, Jiang, and Sun 2021).

Data are obtained from purchasing and procurement managers of Spanish wholesale intermediary companies of FMCG's official distribution channel by means of a survey conducted between 2018 and 2019 of the purchasing manager who has a broad view of the marketing channel. 86% of the companies identified themselves as small or medium-sized companies (the wholesale distribution of FMCG is highly fragmented because the large retail distribution chains source directly from the manufacturer). Within FMCG, 42% identified themselves as beverage distributors (spirits and softs), 25% as dry food distributors and the rest as others (home care, beauty & personal care).

The target companies are obtained from the Spanish publication INDISA, which specializes in FMCG distribution. After contacting 4,000 distributors, 172 responses were obtained from an e-mail questionnaire (response rate of 4.30%). Distribution companies are reluctant to provide data that could generate controversy, such as their own share of the gray market. Therefore, in addition to the concepts under study, control variables such as the size of the distribution company, type of customer, or category of products distributed were introduced. It was found that the control variables had no effect on the results. To check if our sample size is suitable to validate the effects found in this study, we utilized G*Power 3.1.9.2 software (Faul et al. 2007). Considering the existence of two relationships with the endogenous variable, if an average effect size is assumed to obtain a power of 0.80, an effect size of 0.15, and an alpha level of 0.05, the minimum sample necessary is 68 samples (Cohen 1988). Therefore, we can validate the significant relationships found in the proposed model.

Before the survey was sent, a pretest was carried out with purchasing managers from distribution companies. The purpose of the pretest was to analyze whether the concepts were appropriate to the business environment and to avoid doubts in the answers. The feedback received induced a high probability of face validity (Hardesty and Bearden 2004). To analyze non-response bias, the sample was divided into two

subsamples according to the dates of collection, and a comparative analysis of means was performed. The results suggest a low probability of non-response bias (Armstrong and Overton 1977).

Measurement scales

The constructs of the model were measured using a Likert-type scale with seven levels, from 1 = "Strongly disagree" to 7 = "Strongly agree." The items used are listed in Table 3.

GMP (Gray market Participation): The construct measures the participation of an official distributor in the gray market with a four-item scale have been previously validated in other studies in the field of the gray market (Gimeno-Arias and Hernández-Espallardo 2020). Items 1–3 measure the sourcing of products through the gray market, while item 4 establishes whether the product is sold to the gray market. In both cases, the scale reflects an official distributor's business done in the gray market.

ODPGM (Other official distributors participation in the gray market): It is an exogenous construct that establishes the participation of other distributors belonging to the same official network in the gray market (Antia et al. 2006).

MPGM (Manufacturer participation in the gray market): Sometimes the manufacturer does business in the gray market: "Sometimes a manufacturer itself will sell into the gray market as salespeople struggle to meet quotas or managers attempt to cover costs or make year-end goals. This has been a common scenario at computer and cell phone manufacturers." (Antia, Bergen, and Dutta 2004). The construct measures whether this situation is observed by the official distributor that decides to participate in the gray market.

It should be noted that single-item scales have been used for constructs ODPGM and MPGM.

Traditionally, the constructs used in marketing research have had several scales, but the main justification has been statistical necessity (i.e., LISREL) (Bergkvist and Rossiter 2007; Rossiter 2002, 2005). However, if the object and attribute can be conceptualized as concrete and singular, it does not require multiple items for measurement (Bergkvist and Rossiter 2007). In these cases, the use of several items that are merely synonyms of the main item does not provide information and has high correlations. Therefore, the C-OAR-SE method was used to measure the concepts ODPGM and MPGM (Rossiter 2002).

Data analysis

The data of this research were analyzed through partial least squares structural equation modeling (PLS-SEM) using SmartPLS 3.3 software (Ringle, Wende, and Becker 2015). This technique was chosen for its ability to estimate causal relationships between constructs. In addition, PLS-SEM is a technique that does not require a large sample, nor does it require assuming the normality of the data contained in the sample (Hair et al. 2019). Finally, as stated by Basco et al. (2021), PLS-SEM can easily handle reflective and formative measurement models, and single-item constructs. The latter is what has led to the use of this technique. To test the hypotheses, bootstrapping was carried out with 10,000 samples (Streukens and Leroi-Werelds 2016).

Results

The results were obtained in 5 phases: a) analysis of the goodness of fit; b) analysis of the measurement model; c) analysis of the structural model; d) analysis of the quadratic effect and d) analysis of the predictive capacity of the model.

Table 3. Measuring scales.

Constructs	Items	Source
GMP	GMP1: "Most of the time, sourcing on the gray market is a better choice." GMP2: "You buy merchandise of this brand in gray markets to benefit your customers." GMP3: "It is never a mistake to source from the gray market." GMP4: "You sell products on the gray market because it is a good, profitable alternative for your company."	Gimeno-Arias and Hernández-Espallardo (2020)
ODPGM	ODPGM1: "There are official distributors that sell this brand through unofficial channels."	Antia et al. (2006)
MPGM	MPGM1: "Manufacturer or brand owner intentionally releases product through the unofficial channel."	Antia, Bergen, and Dutta (2004)

Source: Own elaboration.

Analysis of the goodness of fit

The results presented in Table 4 in relation to the overall goodness-of-fit analysis of the model show an adequate fit of both the estimated model and the saturated model for the three statistics used in PLS-SEM (SRMR: Standardized Root Mean Square Residual; dULS: Unweighted Least Squares Discrepancy and dG: Geodesic discrepancy). Since results are below the bootstrap-based 99% (HI99) percentile (Henseler, Hubona, and Ray 2016).

Analysis of the measurement model

Our model consists of three latent variables. Two are single-item (ODPGM and MPGM), and the remaining one (GMP) comprises four items. Due to the high correlation between its indicators and how it was configured through the survey, GMP has been considered a composite in mode A (Rigdon 2016).

Through the examination of the standardized factor loadings, the individual reliability of the items that make up GMP have been checked since, as can be seen in Table 5, all values are higher than 0.707 the minimum value established (Hair et al. 2019). Similarly, the construct reliability was analyzed through the study of Cronbach's alpha,

the composite reliability, and the Dijkstra-Henseler rho ratio. Since these values exceed the minimum of 0.7, we can conclude that the construct has adequate reliability (Dijkstra and Henseler 2015). In the same way, since the value obtained for the AVE is higher than 0.5, adequate convergent validity has been demonstrated (Hair et al. 2019).

Discriminant validity has also been tested (the results are shown in Table 6). On the one hand, Fornell-Larcker's (Fornell and Larcker 1981) criterion has been applied, verifying that the correlations between each pair of constructs do not exceed the square root of the AVE (Henseler 2018). On the other hand, it has been verified that the values for HTMT do not exceed the maximum established of 0.85 (Hair et al. 2019).

Analysis of the structural model

To begin the structural model analysis, it has been verified that the Variance Inflation Factor between the constructs does not exceed the maximum value of 3. As can be seen in the results shown in Table 7, the VIF value is much lower than 3 (Hair et al. 2019), so the existence of collinearity problems can be ruled out.

The two path coefficients' sign, magnitude, and statistical significance were then analyzed through a one-tailed bootstrapping (10,000 samples). The

Table 4. Test of model fit.

	Estimated Model		Saturated Model	
	Value	HI99	Value	HI99
SRMR	0.079	0.167	0.078	0.165
d_{ULS}	0.157	0.583	0.160	0.571
d_G	0.086	1.192	0.85	1.172

Standardized root mean square residual (SRMR). Unweighted least squares discrepancy (d_{ULS}). Geodesic discrepancy (d_G).

Table 5. Assessment of measurement model.

Composite indicators	Mean	SD	Loading	t-student*	Q^2	α	ρA	ρC	AVE
GMP					0.116	0.721	0.726	0.701	0.518
GMP_1	2.651	1.882	0.864	22.744	0.270				
GMP_2	1.779	1.446	0.831	20.088	0.180				
GMP_3	2.763	1.974	0.713	3.255	0.014				
GMP_4	1.872	1.343	0.746	3.510	0.030				
ODPGM									
ODPGM_1	3.326	2.156	1.000						
MPGM									
MPGM_1	2.535	1.927	1.000						

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: Cronbach'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.

Table 6. Discriminant validity.

	I	II	III
I GMP	**0.647**	*0.557*	*0.626*
II ODPGM	0.496	**1.000**	*0.583*
III MPGM	0.543	0.583	**1.000**

HTMT ratio over the diagonal (italics). Fornell – Lacker criterion: square root of AVE in diagonal (bold) and construct correlations below the diagonal.

results in Table 7 show as ODPGM has a significant positive effect on GMP ($\beta = 0.272$***), supporting H1. Similarly, the effect of MPGM on GMP is significant and positive ($\beta = 0.384$***), supporting H2.

The coefficient of determination (R^2) shows us how the model explains 33.60% of the variance in GMP. The R^2 value is greater than the threshold value of 10% established by Falk and Miller (1992). Therefore, the explanatory capacity of the model is suitable.

The contribution of each independent variable to the R^2 of the dependent variable has been checked through the effect size (f^2) (Cohen 1988). In both cases, the minimum established value of 0.02 is exceeded (Hair et al. 2019).

In order to accept or discard hypothesis 4, we have not only taken into account that the path coefficient and the f^2 of the relationship between MPGM and GMP is greater than those obtained in the relationship between ODPGM and GMP, but we have also resorted to the importance-performance map analysis (IPMA). This analysis allows us to know an independent variable's performance in explaining the dependent variable (Ringle and Sarstedt 2016). Therefore, IPMA can be applied to discover which independent is more relevant in the determination of the dependent variable. Through SmartPLS, we have acquired the IPMA for GMP. As a result, as can be seen in Figure 1, MPGM contributes more to the determination of GMP than ODPGM. This result leads us to accept hypothesis 4.

Analysis of the quadratic effect

In addition, in order to test hypothesis 3, the proposed model has been enhanced with a nonlinear effect through a quadratic function between ODPGM and GMP, using SmartPLS (Basco et al. 2021). For this purpose, a negative quadratic interaction with a positive linear effect on the relationship between ODPGM and GMP was applied. Moreover, with the objective of determining the significance of the nonlinear effect, the two-stage approach was adapted to estimate the model (Sarstedt et al. 2020).

The results show that the linear effect of ODPGM on GMP increased from 0.272 (Table 7) to 0.343. The f^2 effect size is 0.105, which is a suitable effect. Similarly, the results showed that the interaction term had a significant and negative direct effect on GMP. An increase in ODPGM by one standard deviation unit decreased the relationship with GMP by 0.190 (i.e., from 0.517 to 0.327). Consequently, we can state that the relationship between ODPGM and GMP decreases exponentially for higher levels of ODPGM. Moreover, we checked the f^2 effect sizes of ODPGM-GMP; the value of 0.03 corroborates a suitable effect (Basco et al. 2021). Therefore, H3 is accepted.

Analysis of the predictive capacity of the model

The relevance predictive of ODPGM and MPGM have been checked through a blindfolding procedure applied in SmartPLS. The results in Table 5

Table 7. Structural model assessment.

	Path	SD	T-value	f^2	95CI		H	Supported
Direct effects						VIF		
ODPGM -> GMP	0.272	0.079	3.435***	0.075	[0.140;0.402]	1.516	H1	Yes
MPGM ->GMP	0.384	0.088	4.481***	0.148	[0.250;0.532]	1.516	H2	Yes
Quadratic effects								
ODPGM x ODPGM -> GMP	−0.190	0.09	2.613**	0.03	[0.001;0.096]		H3	Yes

R^2 [95% CI in brackets]: GMP: 0.336 [0.251; 0.457]; Standardized path values reported; f^2: size effect index; 95PCI: 95% 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; **: $p < 0.01$; ***: $p < 0.001$.
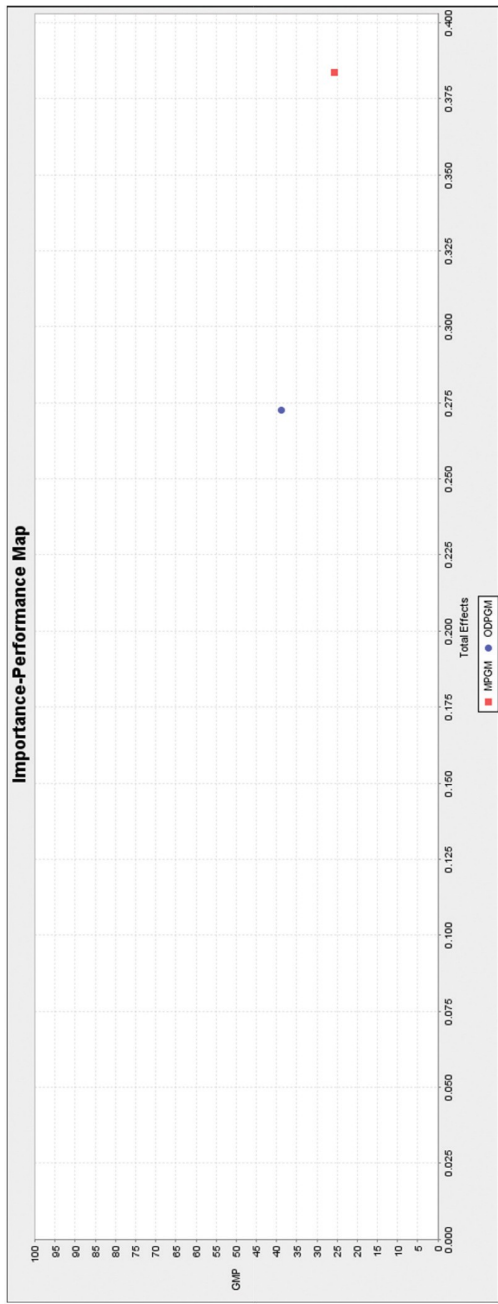
Figure 1. IPMA GMP graph.

Table 8. PLS Predict assessment.

	Q^2						
GMP	0.306						

	PLS			LM		PLS-LM	
	RMSE	MAE	Q^2	RMSE	MAE	RMSE	MAE
GMP_1	1.576	1.232	0.309	1.577	1.396	−0.001	−0.164
GMP_2	1.336	0.885	0.159	1.339	0.906	−0.003	−0.021
GMP_3	87.668	23.029	0.008	87.746	23.134	−0.078	−0.105
GMP_4	140.487	60.685	0.019	141.167	61.187	−0.680	−0.502

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 6 k-fold and 10 repetitions.

show as all Q2 values are positive. Therefore, the relevance predictive of the model is demonstrated (Evermann and Tate 2016). However, we have gone one step further and have evaluated the predictive performance through PLS Predict. According to Shmueli et al. (2019), the PLS Predict algorithm has been applied with k = 6 folds and 10 repetitions, with the target to compare PLS errors and the Lineal Regression Model (LM). The results in Table 8 show as PLS produces smaller errors than LM. Moreover, in both independent variable and item levels, all the Q2 values are higher than 0. Therefore, the predictive performance is validated (Shmueli et al. 2019).

Based on the results obtained in this section, it can be affirmed that the proposed model is confirmatory-causal, with goodness-of-fit indicators, the four hypotheses are fulfilled and with predictive character.

Discussion

In our theoretical framework, we have defined the reference group as the set of agents that share norms and values and guide the behavior of its members (Haas and Park 2010; Hult 2011; Shibutani 1955). We have also established the official distribution network as a reference group where strategies are shared (Chung et al. 2011; Siguaw, Simpson, and Baker 1998). The confirmation of hypotheses H1 and H2 ($\beta = 0.272^{***}$ and $\beta = 0.384^{***}$, respectively) corroborate this reasoning. The actions of an official distributor are guided by those of other official distributors as well as the manufacturer or brand owner. Suppose an official distributor assists the gray market participation of other official distributors, the manufacturer, or both. In that case, the strategy it will adopt will consist of its own participation in this type of business. In doing so, we found motivation for the gray market participation by an official distributor that had not been studied to date. Previous studies based on microeconomic efficiency, mainly in price arbitrage.

We have also established a limit to the official distributor's participation in the gray market. This limitation is due to the distributor's fear that the manufacturer may take measures to regulate participation in the gray market. In some cases, it has been observed that this enforcement can be "resale restrictions, including fines, litigation, social ostracism, and termination" (Antia et al. 2006, 93). Exclusion from the official network can have catastrophic consequences for an official distributor since gray market procurement is circumstantial and temporary (Gimeno-Arias and Hernández-Espallardo 2020). The confirmation of hypothesis H3 (β=-0.190**) establishes the saturation point of the official distributor's actions when they come from the follow-up of other official distributors.

Last, we have argued that imitation of behavior has a greater weight on the performance of the official distributor. Due to the manufacturer or brand owner having greater legitimacy within the reference group (Chung et al. 2011; Dacin, Oliver, and Roy 2007), imitation of the latter will have a greater effect. Therefore, the confirmation of hypothesis H4 establishes the greater effect of the manufacturer's gray market participation compared to when it is another distributor that participates in this type of business. The behaviors of the official marketing channel leader are more likely to be imitated.

Figure 2 shows the effect of the gray market share of an official distributor (GMP) on the share of the manufacturer (MPGM) and other
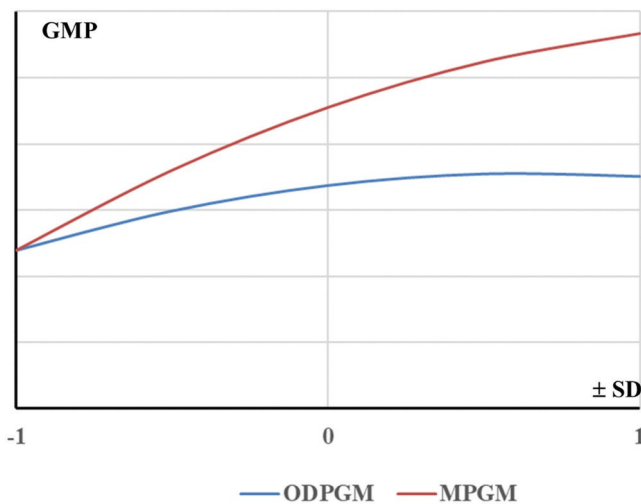
Figure 2. Effect of ODPGM and MPGM on GMP for ± SD.

official distributors (ODPGM) for a range of values of −1 and+1 standard deviation (SD). We can observe how the effect of MPGM is greater than ODPGM (H4 accepted). The saturation effect can also be appreciated (H3 accepted), as the imitation of the participation of other official distributors (ODPGM) finds its maximum before+1 SD.

Conclusions

The gray market literature has explained its origin and proposed solutions using the price differential between market segments. Although a gray market would undoubtedly not exist in the absence of these circumstances, we believe that there are additional factors that explain the transactions that take place in it. In fact, there are distribution channels with a greater or lesser incidence of the gray market under the same conditions.

On the other hand, the behavior of agents in marketing channels has been explained from different theoretical perspectives, such as microeconomic (transaction costs and agency theory), game theory, resource-based view, or the relational paradigm (Watson et al. 2015). However, only theories based on microeconomics, such as transaction costs, have been applied to such a peculiar phenomenon as the gray market. Our study shows that there are theoretical frameworks that help to understand the behavior of channel members, such as the reference group theory.

From the point of view of business management of marketing channels, the solutions proposed to the incidence of the gray market have been limited to price homogenization or to the selection, monitoring, and enforcement applied to channel intermediaries. In the case of price homogenization, we consider it unrealistic because it would disrupt a basic marketing strategy such as segmentation. However, our study provides novel solutions for management, such as the care channel members must take by imitating their strategic actions (both manufacturer and official distributor). The agents should be careful not to make them excessively visible to other members of the official distribution channel, especially in the case of the manufacturer or brand owner.

Managerial implications affect the manufacturer or brand owner because it is the leader of the official marketing channel and the one indicated to maintain its efficiency, as well as the profitability and satisfaction of its strategic partners (official distributors). Furthermore, the gray market disrupts the distribution margin strategy devised for each market because it increases volumes in lower-margin markets. Therefore, the manufacturer must apply three basic principles to maintain order in the official distribution channel.

(a) Not participating in the gray market even if he requires additional sales. The analysis conducted shows that it is the channel agent with the greatest potential to be imitated by an official distributor. The sales requirement must be managed within the official channel.
(b) Develop a system of punishments and rewards so that official distributors do not go to the gray market. When more official distributors turn to the gray market, more distributors will join them.
(c) Implement control systems that allow you to locate the origin of the gray market to act promptly on it, for example, interrupting the supply to the official agent that originates the gray market.

Due to the behavioral imitation effect, the further disorder in the official channel can lead to an increasing spiral of undesired actions.

One limitation of our study is that it is based exclusively on the Reference Group Theory. Similarly, the data were obtained in a pre-pandemic scenario. For future research, we recommend combining it with other theories that offer a multidimensional view of the gray market problem to the strategic design of the distribution channel. In addition, the relationships between business partners also play a key role. On the other hand, it would be of interest to the academic community to compare the data obtained with the situation after the pandemic.

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