Coopetition, bargaining power and product commercial performance

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Abstract: This research studies the impact of various coopetition strategies (horizontal and vertical coopetition) on product commercial performance. Considering the mixed results of the existing literature on coopetition and performance, we shed new light on their contributions by making a distinction between horizontal and vertical coopetition thanks to a change in our level of analysis from the firm to the product level. Building on the coopetition and the bargaining power literatures, we elaborate a theoretical model and several hypotheses. Using a database in the real estate brokerage industry, we show that horizontal coopetition strategies increase the product commercial performance whereas vertical coopetition strategies don't. In addition, we underline that horizontal coopetition is more beneficial to large firms than to small firms. Finally, we put forward the existence of a learning effect regarding coopetition strategies. In other words, the more firms coopete over time the better they get at extracting value at their own advantage. These results not only contribute to the literature focusing on the performance implications of coopetition strategies but also to the coopetition theory by underlining the bargaining power mechanisms at stake in presence of coopetition.

Keywords : Horizontal coopetition, Vertical coopetition, bargaining power, product commercial performance, product level analysis, real estate brokerage industry

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1. Introduction

This research aims at assessing the impact of various coopetition strategies (horizontal and vertical coopetition) on product commercial performance.

According to the coopetition literature, coopetition should offer superior performance to other relational modes because it combines cooperative and competitive behavior advantages (Bengtsson and Kock, 2000; Brandenburger and Nalebuff, 1996; Lado et al., 1997). However, empirical studies have shown mixed results. Some articles have highlighted a negative impact of coopetition on performance (Kim and Parkhe, 2009), others neutral relationships (Knudsen, 2007) or a positive effect (Luo et al., 2007, Peng et al., 2012). Finally, some recent contributions have insisted on the necessity to take into account moderating

variables to understand better the link between coopetition and performance (Le Roy et al, 2016; Ritala, 2012; Wu, 2014).

In this research, we focus our attention on value appropriation and value creation issues (Ritala and Hurmelinna-Laukkanen, 2009, 2013) with a strong emphasis on the relationship between the firm and its customers. More precisely, we try to understand how coopetition strategies impact the bargaining power of firms when selling their products to customers. Several recent contributions have highlighted that coopetition strategies can modify the relative number of customers and sellers for the products without modifying the product's characteristics (Chiambaretto and Dumez, 2016; Kylanen and Rusko, 2011).

Building on these contributions and on the bargaining power literature (Cook and Yamagishi, 1992; Easley and Kleinberg, 2010; Emerson, 1962), we elaborate a theoretical model at the product level in which we draw a distinction between vertical and horizontal coopetition. Based on this model, we generate a set of hypotheses on the links between coopetition and product commercial performance.

To test these hypotheses, we construct a database in the real estate brokerage industry by collecting data from sales of agencies belonging to the *Amepi List* (called "*Fichier Amepi*" in French). The *Amepi List* is the French equivalent of the American MLS (Multi Listing System) and consequently relies on coopetition strategies. We have collected data from every sale of these agencies in 2013, even if they were done outside the formal association. 469 sales were listed in our database combining sales made in competition, in vertical and horizontal coopetition. To test our hypotheses, we ran several linear regressions (OLS) to study the impact of various variables and their potential interactions.

Our results show that to study the impact of coopetition strategies on performance, one must address this issue at the product level. We highlight that horizontal coopetition strategies increase the product commercial performance whereas vertical coopetition strategies don't. In

addition, we underline that horizontal coopetition is more beneficial to large firms than to small firms. Finally, we put forward the existence of a learning effect regarding coopetition strategies. In other words, the more firms coopete over time the better they get at extracting value at their own advantage. These results not only contribute to the literature focusing on the performance implications of coopetition strategies but also to the coopetition theory by underlining the bargaining power mechanisms at stake in presence of coopetition.

2. Theoretical background

2.1. Coopetition and value creation

In highly uncertain environments, it is harder and harder for firms to conduct purely individual strategies. They need to cooperate with partners to have access to specific resources or knowledge they do not own internally (Dyer and Singh, 1998; Eisenhardt and Schoonhoven, 1996). In fact, as they try to access more and more resources, firms multiply their alliances and find themselves at the centre of a real alliance portfolio (Wassmer, 2010). But often, the partners presenting the best level of resource complementarity and compatibility are competitors (Gnyawali and Park, 2009). Consequently, one observes the emergence of alliances between competitors.

To understand the specificities of this strategy, the concept of coopetition has been developed (Brandenburger and Nalebuff, 1996). Many definitions of coopetition can be found in the literature. The widest definition is the one provided by Brandenburger and Nalebuff (1996) encompassing all the partners of the value network. On the opposite, we adopt the more restrictive definition given by Bengtsson and Kock (2000) in which they characterize coopetition as “the dyadic and paradoxical relationship that emerges when two firms cooperate in some activities, such as in a strategic alliance, and at the same time compete with each other in other activities.” Building on this definition, we consider that coopetition is the

situation in which firms are in competition on some activities, markets and products while being simultaneously on cooperation for other activities, markets and products.

Given this definition, we identify two forms of coopetition depending on the structure of cooperation (Pellegrin-Boucher et al., 2013). Vertical coopetition characterizes a situation in which two competing firms are in a supplier-customer relationship for a given activity, market or product. By contrast, horizontal coopetition refers to a situation in which two competing firms compete and cooperate at the same level of the value chain, or on the same market, or for the same product.

From a performance viewpoint, if we stick to theoretical models, coopetition should generate added value and offer superior performance to other relational models (cooperative or not). The primary benefits associated with coopetition arise from the combination of cooperative and competitive behaviors (Bengtsson and Kock, 2000; Brandenburger and Nalebuff, 1996; Lado et al., 1997). The cooperative dimension allows firms to access key resources or technologies to launch new products or access new markets. In parallel, the competitive dimension of coopetitive agreements is essential to avoid complacency and to maintain the creative tension between organizations (Park et al., 2014; Quintana-Garcia and Benavides-Velasco, 2004; Raza-Ullah et al., 2014). However, are these results empirically verified?

Without using the concept of coopetition, several contributions have measured the impact of horizontal collaborations (i.e., collaborations with competitors) on performance using different measures such as market performance or innovation. However, the results are often mixed. Some research shows zero (Miotti and Sachwald, 2003; Santamaria and Surroca, 2011) or a negative impact (Nieto and Santamaria, 2007; Un et al., 2010). Other research shows a positive impact of cooperation between competitors on product innovation (Belderbos et al, 2004; Neyens et al., 2010; Tomlinson, 2010).

With the development of specific databases, we observe the emergence of different studies trying to link specifically coopetition strategies and performance. Here again, results are mixed: some articles highlight negative relationships (Kim and Parkhe, 2009), others find neutral relationships (Knudsen, 2007) or a positive effect (Luo et al., 2007, Peng et al., 2012).

Finally, a new set of contributions has tried to understand these mixed results insisting on moderating variables. Ritala (2012) highlights that market uncertainty and network externalities strengthen the positive impact of coopetition on innovation and performance. Ritala (2013) also shows how absorptive capacity and appropriability strengthen or moderate the impact of coopetition on innovation. Wu (2014) puts forward the existence of a bell-shaped curve between the level of coopetition and product innovation. Finally, Le Roy et al. (2016) show that coopetition has a positive impact on product innovation when the coopetitor is distant geographically.

2.2.Coopetition and value appropriation

In their seminal contribution, Brandenburger and Nalebuff (1996) not only introduced the concept of coopetition but they also highlighted the tensions related to the cooperative dimension of value creation and the competitive dimension of value appropriation.

Indeed, tensions between cooperation and competition are typically driven by the conflict between generating shared benefits and capturing private benefits (Czakon, 2010; Khanna et al., 1998; Ritala and Tidström, 2014). Contrary to traditional alliances, in a coopetitive setting the partners can absorb and combine shared resources with their own resources for their own purposes. Consequently, the risk of opportunism and appropriation is much higher (Bouncken and Kraus, 2013; Ritala and Hurmelinna-Laukkanen, 2009, 2013).

However, instead of trying to reduce these tensions, it has been shown that firms must accept and manage these tensions, whose outcomes can be highly beneficial if managed

properly (Bengtsson et al., 2010; Chen, 2008; Luo et al., 2006). As a consequence, several contributions have tried to present the specificities of the management of coopetition strategies (Bengtsson and Kock, 2000; Fernandez et al., 2014; Tidström, 2014). They shed light on the management tools and mechanisms used by firms to combine value creation and value appropriation tensions in an optimal way.

Nevertheless, whatever the approach used to study the value appropriation implications of coopetition, the contributions remained focused on the partnering competitors. The key articles focusing on value creation and value appropriation dynamics in coopetition highlighted inter-firm dynamics and neglected most other stakeholders (Ritala and Hurmelinna-Laukkanen, 2009, 2013; Ritala and Tidström, 2014).

But so far, none of these contributions has investigated the value appropriation between the firm and the customers. In their seminal contribution, Brandenburger and Nalebuff (1996) posit that the ultimate goal of coopetition is to generate higher value for customers under all circumstances. Most contributions in the coopetition literature build on this assumption, but so far, this statement has not been empirically analyzed. To our knowledge, there is no past research focusing on the effect of coopetition on customers.

Some contributions have insisted on the key role of customers on the development of coopetition strategies for their own good. For instance, Depeyre and Dumez (2010) or Wu et al. (2010) highlight how customers can structure the relationship between suppliers by encouraging them to adopt coopetition strategies. However, these contributions focus on cases in which the customer is at the origin of the coopetition strategies. But such situations are quite rare and mainly observed in business-to-business configurations. In fact, in most cases, firms implement coopetition and customers are not aware of its existence (Bengtsson and Kock, 2000). In most business-to-customers markets, coopetition is thus an invisible strategy for customers and the question of the value appropriation remains under uninvestigated.

The question of the impact of coopetition on customers regarding the value creation and appropriation has not been studied in past research. Only Walley (2007) mentioned in his research agenda the necessity to study the interactions between customers and firms from a value creation and appropriation perspective. In this research, we thus investigate the value creation and appropriation implications of coopetition on customers. To do so, we mobilize the bargaining power theory to understand how the value is shared between the firms and the customers.

2.3.Value creation, value appropriation and bargaining power

As explained by Gnyawali and Park (2011), value creation and value appropriation play an essential role in understanding coopetition dynamics. The ability to create joint value while being able to capture a significant part of this value for the firm's own profit can be linked to the concept of performance. Even in their seminal contribution, Brandenburger and Nalebuff (1996) clearly state that firms can develop a superior performance if they implement a sound strategy regarding value creation and value appropriation when they coopete with a firm.

Defining the performance as the ability for the organization to reach its own objectives, one can clearly see the link between performance and the bargaining power. The larger the bargaining power of the firm, the larger will be its performance (Porter, 1980). In addition, Gnyawali and Madhavan (2001) and Huxham and Beech (2008) explain that inter-organizational relationships can change the relative power between actors in a social network. Consequently, one should expect inter-organizational strategies such as coopetition to modify the bargaining power not only between firms, but also between the focal firm and its stakeholders such as customers.

To assess the bargaining power between actors, most contributions build on Emerson (1962)'s theory. Following Emerson's definition, actor *A* is not powerful; instead, an actor has

power over another actor (actor *B*). The power of actor *A* over actor B ($P_{A/B}$) can thus be defined as the amount of resistance on the part of *B* that can potentially be overcome by *A*. In fact, power implicitly resides in the other's dependence: the more dependent a partner is, the more power the focal actor has over that partner. The dependence of actor *A* on actor *B* ($D_{A/B}$) is thus (1) directly proportional to *A*'s needs that are mediated by *B* and (2) inversely proportional to the number of alternative actors able to provide the same resources to *A*. One of the key contributions of Emerson (1962) has been to link power and dependence in the following equation:$P_{A/B} = D_{B/A}$.

To understand how the value is created and shared by a firm in coopetition when interacting with its customers, we elaborate a theoretical framework.

3. Theoretical framework

3.1.Performance analysis: from the firm level to the product level perspective

To shed new light on the link between coopetition and performance, we change the level of analysis. We indeed observe that most contributions focusing on the link between coopetition strategies and performance have remained at the firm level. In other words, whatever the measure used (financial performance, innovation, etc.), the performance of coopetition strategies was assessed at the firm level. But most firms combine different strategies consisting of vertical coopetitive agreements, horizontal coopetitive agreements and individual strategies (Duysters et al., 2012; Park et al., 2014; Wu, 2014). Consequently, even if previous studies used control variables to neutralize the effect of other strategies, the firm's performance was still mixing different elements. The firm-level performance could be affected by other business units or products that are not related to coopetition strategies. Because most firms have to deal with an entire line of products (Teece, 1982), each of them being associated with a different relational mode (individual, vertically or horizontally

coopetitive), we state that to measure the real impact of coopetition on performance, one must measure the performance at the product level and not at the firm level anymore.

A very rich literature has studied the impact of inter-organizational relationships on product success or product performance. For instance, several authors highlight that alliances generate resource and knowledge complementarities that increase the likelihood of developing a successful product (Knudsen, 2007; Yao et al., 2013). Other authors have shown that alliances were a way to access more customers using the partner's customer base (Gimeno, 2004; Uggla and Åsberg, 2010, Voss and Tansuhaj, 1999). In the co-branding literature, it is shown that alliances between firms generate positive brand transfers and increase the purchase intentions and actual purchases (Simonin and Ruth, 1998; Swaminathan et al., 2012). However, all these contributions study situations in which the characteristics of the product are changed by the inter-organizational relationship. For example, alliances contribute to combining different technologies and thus developing a product that could not have been done alone (Das and Teng, 2000; Dyer and Singh; 1998). Consequently, they do not measure, *ceteris paribus*, the impact of relational modes on the product performance because the alliance actually changes the nature of the product.

But several recent contributions have highlighted that coopetition strategies could be used to access to the competitor's customers without having any impact on the characteristics of the product (Chiambaretto and Dumez, 2016; Kylanen and Rusko, 2011). According to these contributions, coopetition strategies allow competing firms to benefit from market complementarities by merging their customers' base.

We build on this approach to elaborate our theoretical framework and assess the performance of coopetition strategies at the product level.

3.2.Competitive, horizontal and vertical coopetitive configurations

Building on the contributions showing that coopetition is a way to access to more customers (Chiambaretto and Dumez, 2016; Kylanen and Rusko, 2011), we elaborate a theoretical framework. More precisely, we build on the social network theory (Burt, 1992; Easley and Kleinberg, 2010) to represent how coopetition allows firms to access more customers. One of the advantages associated to this social network representation relies in its ability to integrate bargaining power issues (Easley and Kleinberg, 2010). The ways in which the power can be partly rooted in the structure of a social network has generated an entire field of research called the "network exchange theory" (Luca et al., 2001; Willer, 1999; Skvoretz and Willer, 1993).

We note F_i a firm i trying to sell n_i products alone (i.e., in competition) noted as P_{ia} where $a = 1,2,\ldots,n_i$. In addition, this firm supplies s_{ij} products with a downstream partner F_j in a vertical coopetition setting. These goods are noted V_{ijb} where $b = 1,2,\ldots,v_{ij}$. Moreover, the firm can share h_{ij} products with a competitor j while keeping the possibility to sell product itself (i.e., in horizontal coopetition) noted H_{ijc} where $c = 1,2,\ldots,h_{ij}$. Finally, each firm F_i has its own customer base, composed of l_i customers, each of them being identified as C_{id} where $d = 1,2,\ldots,l_i$.

If we consider the case of a firm F_i operating alone, it only has n_i products to offer to its l_i customers. This is the case depicted in Figure 1a with $n_i = 3$ and $l_i = 5$.

A second situation can occur when two competing firms F_i and F_j cooperate vertically (i.e., vertical coopetition). In this case, the firm F_i cooperates with the firm F_j by supplying a product that has not be sold to its l_i customers in order to have access to the l_j customers of the firm F_j. For the product supplied by F_i with the firm F_j, the number of customers accessed changes from l_i to l_j. Such a strategy can be relevant if l_j is larger than l_i or if the l_j customers are more interested in buying the product than the l_i customers. Under such a configuration,

the supplying firm F_i renounces to sell the product itself and shares the revenues of the sale made by F_j. Consequently, there is no direct competition for this specific product. This is the case depicted in Figure 1b with $n_i = 3; l_i = 5; v_{ij} = 2; n_j = 2$ and $l_j = 4$.

Finally, we consider the case of two competing firms F_i and F_j which both have products that they sell under competition (n_i and n_j) and products that they share with each other (H_{ijb}). The firm F_i has n_i own products to offer to its l_i customers and H_{ijb} shared products to sell to $l_i + l_j$ customers. Symmetrically, the firm F_j has n_j goods to offer to its l_j customers and H_{ijb} goods to sell to $l_j + l_i$ customers. Contrary to the previous situation (i.e., vertical coopetition), both firms F_i and F_j can sell the product shared. They are consequently in simultaneous competition and cooperation for these products shared. This last case of horizontal coopetition is represented in the Figure 1c with the following parameters: $n_i = 3$; $l_i = 5$; $h_{ij} = 4$; $n_j = 4$; $l_j = 6$.

Figure 1. Relationship configurations

Figure 1a. *Competitive configuration for the firm F_i*

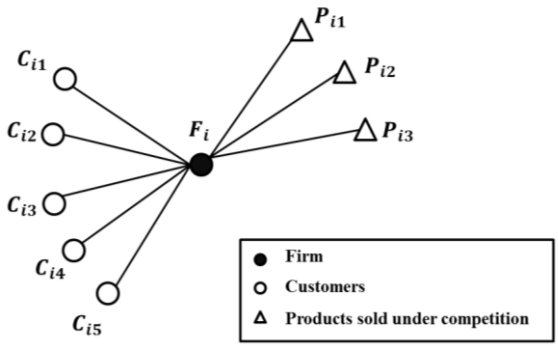


Figure 1b. *Vertical coopetition configuration for the firms F_i and F_j*

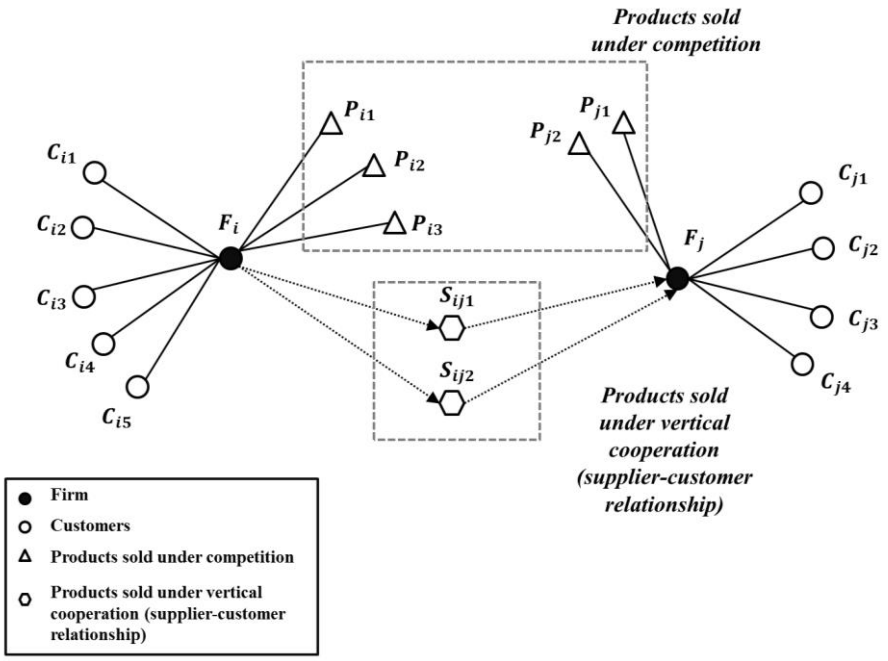
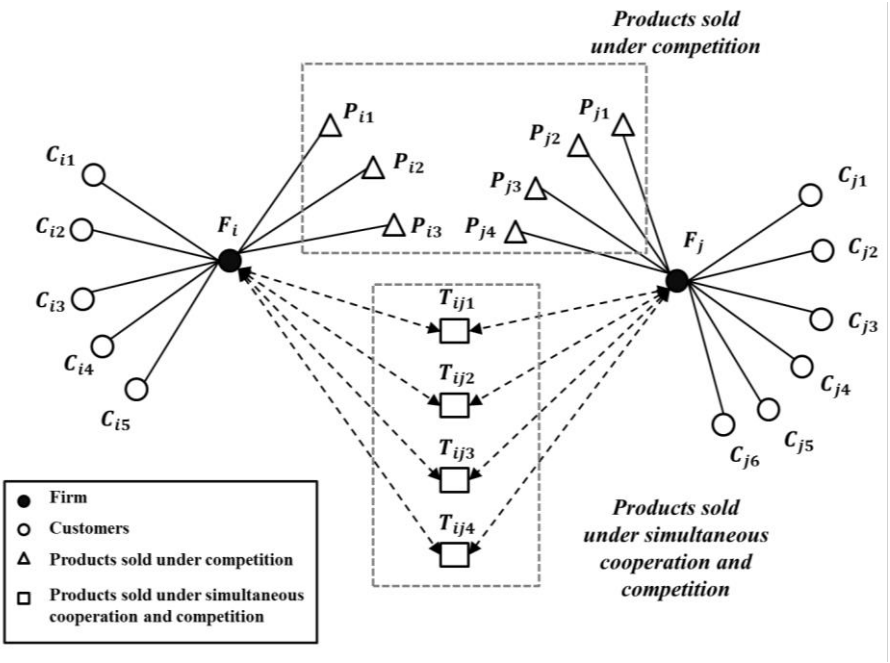


Figure 1c. *Horizontal coopetition configuration for the firms F_i and F_j*



It is interesting to note that the firm F_i does not have access to the same number of potential customers depending on the relational mode and the product it sells. For a product sold in competition, the firm F_i has access to l_i customers for its product. For a product sold

in cooperation, the firm now access to l_j customers. Finally, for a product sold in coopetition, the firm F_i has access to $l_i + l_j$ customers for its products.

3.3.Bargaining power and commercial performance

In our case, we study the evolution of the bargaining power between the seller (the firm F_i) and any customer for a good sold either in competition (P_{ia}), in collaboration (S_{ijb}) or in coopetition (T_{ijc}).

Building on Emerson's definition of power, we apply it to the relationship between a seller A and a customer B. Stating that a seller *A* has power over a customer *B* implies that (1) customer *B* needs the seller *A* to realize its objectives (i.e., buy the product) and that (2) the seller *A* has a high number of alternatives to customer *B* to sell its products. Symmetrically, the customer *B* has power over a seller *A* when (1) the seller *A* needs the customer *B* to realize its objectives (i.e., sell the product) and that (2) the customer *B* has a high number of alternatives to seller *A* to buy the product.

We can formalize the bargaining power of a seller *A* over a customer *B* using a formula. The aim is not to provide an algebraic formula linking the different components; rather, our aim is to explain how bargaining power evolves when the values of the parameters change. Building on Emerson's approach, we know that the larger the importance of the sale for the seller, the more it reduces the seller's bargaining power. We can thus state that (1) the bargaining power of the seller increases when its size increases. Indeed, a seller with a large turnover or with a large number of sales will be less impacted by an additional sale made with customer *B* than a smaller seller. Moreover, we set that for a given product, (2) the larger the number of potential customers, the larger the bargaining power of the seller over any customer. This last point is consistent with the fact that the increased substitutability between customers makes them less critical to the seller. Finally, a recent stream of literature has

highlighted the existence of a learning effect in the bargaining process in strategic networks (Dutta et al., 2003; Zaheer et al., 2000). We thus think that (3) firms using specific relational strategies for a long period are able to take advantage and extract more value from their relationships.

We thus set the following formula:

$$P_{Sell./Cust.} = f(\underbrace{Seller's\ size}_{+}, \underbrace{Number\ of\ other\ customers}_{+}, \underbrace{Experience}_{+})$$

Usually, to assess the bargaining power in relationships in a social network, we assess how the value is shared between two actors (Cook and Yamagishi, 1992; Easley and Kleinberg, 2010; Klein et al., 1978). The larger the focal firm's bargaining power, the larger will be its commercial performance.

3.4.Hypotheses

To assess the impact of coopetition strategies on commercial performance at the product level, we want to measure the implications in terms of performance of having access to the competitor's customers.

Our model allows us to set various hypotheses regarding the impact of several variables on the commercial performance. First of all, we showed that the characteristics of the seller were having a significant impact on its bargaining power when negotiating with a customer (Easley and Kleinberg, 2010; Emerson, 1962). More precisely, we explained that the larger the seller, the larger the bargaining power over customers. We thus set the following hypothesis:

Hypothesis 1. The focal firm's size increases the product commercial performance.

Concerning the impact of vertical coopetition strategies at the product level, our social network representation shows that products sold under this strategy are accessible to l_j

customers instead of l_i customers (Cook and Yamagishi, 1992; Easley and Kleinberg, 2010). However, there is no theoretical grounding allowing us to say that l_j is systematically larger than l_i. It might be the case for some vertical coopetitive agreements or not for other ones. Consequently, we do not expect a significant impact of vertical coopetition on commercial performance. We thus formulate the hypothesis:

> *Hypothesis 2. Vertical coopetition does not impact significantly the product commercial performance*

Regarding the impact of horizontal coopetition strategies on performance at the product level, our social network representation shows that products sold in horizontal coopetition are accessible to a larger number of potential customers ($l_i + l_j$) than products sold in competition (l_i) or in vertical coopetition (l_j). Consequently, for the products sold under horizontal coopetition, the seller has access to more substitutes (i.e., customers) and thus has a larger bargaining power over its customers than under competition (Chiambaretto and Dumez, 2016; Kylanen and Rusko, 2011). Measuring the bargaining power through the product commercial performance, we set the following hypothesis:

> *Hypothesis 3. Horizontal coopetition increases the product commercial performance*

In addition, following several researchers highlighting the existence of learning effect in the bargaining process in strategic networks (Dutta et al., 2003; Zaheer et al., 2000), we expect that firms selling products using horizontal coopetition for a long time will be more likely to outperform the market. Indeed, as they have been using horizontal coopetitive strategies for a longer time, they know better how to take advantage of these strategies when selling products. Consequently, we formulate the following hypothesis:

> *Hypothesis 4. Firms having used horizontal coopetition for a long period show a higher product commercial performance*

Finally, because we considered so far the size and the number of customers independently, we want to study the interactions between them. Regarding vertical coopetition, large firms have a higher number of l_i customers, so that it is less likely that the number of the partner's customers l_j will be larger than l_i. Consequently, we think that vertical coopetition should benefit less to large firms than to small firms. Considering products sold under horizontal coopetition, large firms already have a strong bargaining power that they will combine with their increased bargaining power due to higher customer substitutability. Consequently, we set the last hypotheses:

> *Hypothesis 5. The larger the focal firm's size under vertical coopetition, the lower the product commercial performance.*
>
> *Hypothesis 6. The larger the focal firm's size under horizontal coopetition, the higher the product commercial performance.*

4. Methods

4.1. Industry and market selection

To study the impact of coopetition on product commercial performance, we need to find an industry in which products can be sold in competition, in horizontal or vertical coopetition. Moreover, in order to avoid endogeneity issues, the characteristics of these products must remain unchanged whatever the mode of sale (being sold in competition, in horizontal or vertical coopetition).

An industry meets all these characteristics and requirements: the real estate brokerage industry. Indeed, even if customers do not always see the presence of cooperation between competing firms, this industry has used coopetition strategies since the end of the 19th century through the MLS - Multiple listing services. MLS are local associations that agencies can join in order to share their listings with other agencies.

Real estate agencies receive listings from landlords in order to find a buyer and to sell a property (Rutherford et al., 2001). Real estate agencies have the choice between trying to sell the property alone (in competition); looking for a competing partner to create a supplier-customer relationship for the product (in vertical coopetition); or sharing the listing within the MLS with other members while being allowed to sell the product too (in horizontal coopetition). In other words, MLS are associations where agencies can share resources by sharing brokers' exclusive listings and buyers (cooperative dimension of horizontal coopetition) but remain in competition to find clients and share the margin (competitive dimension of horizontal coopetition). A huge theoretical literature has focused on MLS and on how the broker impacts the product commercial performance (Colwell et al., 1992; Doiron et al., 1985; Johnson et al., 2005; Jud and Frew, 1986; Kamath and Yantek, 1982 and Yavas and Colwell, 1995) but the evidence of this research is mixed (Huang and Rutherford, 2007).

From an empirical point of view, the landlord of a real estate property and his broker share the same objective: to sell the property at the highest price – *price performance* - and as fast as possible – *time performance* (Yavas and Yang, 1995). Therefore, the higher the price paid by customers, the larger the price performance of the broker. Similarly, the faster the product is sold, the better the broker is considered to be (Ford et al., 2005; Hendel et al., 2009; Larsen 1991; Munneke and Yavas, 2001; Rutherford et al., 2001; Yavas and Colwell, 1995; Yavas and Yang, 1995).

4.2.Database

Several studies on performance of coopetition were conducted using databases or surveys (Park et al., 2014; Quintana-Garcia and Benavides-Velasco, 2004; Ritala, 2012; Robert et al., 2009). Thus, we have constructed a database by collecting data from sales of real estate agencies belonging to the *Amepi List* (called "*Fichier Amepi*" in French). The

Amepi List is the French equivalent of the American MLS (Multi Listing System) and consequently relies on coopetition strategies. The *Amepi List* is divided in several local associations grouping local real estate agencies. Every local association is self-managed by its members. Once a broker accepts a new listing, it can sell it alone with a traditional listing (competition); or it can sell it in a supplier-customer relationship (vertical coopetition) or it can sell it using an exclusive listing (horizontal coopetition). But in this last case, the agency has to share its exclusive listings with the other members (cooperative dimension of horizontal coopetition). If the focal agency sells the product itself, it gets the entire commission (competitive dimension of horizontal coopetition). However, if the sale is done by another agency, they share the commission in two equal parts.

We focused on the *Amepi List* in the Avignon area in France. The city and its suburbs count 500,000 inhabitants in the heart of Provence. The city is one of the most dynamic in France for its real estate market. Fifteen agencies are members of the *Amepi List* in Avignon and control more than 70% of the entire local real estate market. Most of these real estate agencies are small and have less than ten employees. We have collected data from every sale of these agencies in 2013, even if they were done outside the formal association. 469 sales were listed in our database, 315 of them (67%) were done in horizontal coopetition, 108 (23%) in competition and 46 of them (10%) in vertical coopetition.

4.3.Variables and measures

4.3.1. Dependent variables

For a good to be sold, we can measure the product commercial performance using two different measures. The use of two different measures for our dependent variable aims at allowing us to verify the robustness of our results. (1) The first measure of the product commercial performance used is the price performance, which is the ability to sell the product

at the highest price to the customer. (2) The second measure of the product commercial performance is the time performance, which is the ability to sell the product quickly.

Consequently, our two dependent variables are: (1) the Price Performance (PP) measured as the opposite of the difference between the price wanted by the seller and the price paid by the customers; and (2) the Time Performance (TP) measured as the opposite of the number of days between the moment in which the property is listed and the moment in which it is sold. Such measures of product commercial performance are consistent with indicators used in the real estate brokerage literature (Ford et al., 2005; Hendel et al., 2009; Larsen 1991; Munneke and Yavas, 2001; Rutherford et al., 2001; Yavas and Colwell, 1995; Yavas and Yang, 1995).

4.3.2. Independent variables

Four independent variables are used in our models. A first independent variable measures the size of the focal firm (SIZE) with the number of sales realized during 2013 by the real estate agency. Regarding the distribution mode, we account for the use of vertical coopetition for a given product with a dummy variable (VCOOPET) taking the value 1 if the product is sold in vertical coopetition and 0 otherwise. Regarding products sold in horizontal coopetition (HCOOPET), it is also a dummy variable taking the value 1 if the sale of the product is done under horizontal coopetition or 0 otherwise. Finally, to assess the learning effect for goods sold using horizontal coopetition, we create a dummy variable (EXPER) taking the value 1 if the firm already belonged to the older version of the MLS system (and has a long experience of horizontal coopetition strategies) and 0 otherwise.

4.3.3. Control variables

Several control variables are added to our model allowing us to neutralize the effects of the product's and the firm's characteristics (Ford et al., 2005; Hendel et al., 2009; Larsen 1991; Munneke and Yavas, 2001; Rutherford et al., 2001; Yavas and Colwell, 1995; Yavas and Yang, 1995). We build on the real estate literature to integrate the following variables: the number of bedrooms (BED); the number of bathrooms (BATH); the age of the property (AGEP); a dummy variable for the presence of a garage or not (GAR) and a last dummy variable (FRAN) to check if the firm is a member of a franchise. A list of all the variables is given in the Table 1.

Table 1. Variables used in analysis

Type of variables	**Name of variables**	**Value**
Dependent variables		
Price Performance	"PP"	Num.
Time Performance	"TP"	Num.
Independent variables		
Size of the focal firm	"SIZE"	Num.
Vertical coopetition strategy	"VCOOPET"	Dummy
Horizontal coopetition strategy	"HCOOPET"	Dummy
Experience in horizontal coopetition	"EXPER"	Dummy
Control variables		
Number of bedrooms	"BED"	Num.
Number of bathrooms	"BATH"	Num.
Age of property	"AGEP"	Num.
Garage	"GAR"	Dummy
Member of franchise	"FRAN"	Dummy

4.4.Analysis

To test our hypotheses, we created three models for each dependent variable (Price performance and Time performance) based on linear regressions (OLS). The model 1 aims mainly at measuring the impact of the main control variables on the dependent variables. It

can be considered as a baseline model, but it does not help us to validate or reject any hypothesis.

(1) $PP\ or\ TP = \alpha_1 BED + \alpha_2 BATH + \alpha_3 AGEP + \alpha_4 GAR + \alpha_5 FRAN + \beta + \varepsilon$

The model 2 adds four independent variables (SIZE, VCOOPET, HCOOPET and EXPER) allowing us to test our hypotheses H1 to H4.

(2) $PP\ or\ TP = \alpha_1 BED + \alpha_2 BATH + \alpha_3 AGEP + \alpha_4 GAR + \alpha_5 FRAN + \alpha_6 SIZE + \alpha_7 VCOOPET + \alpha_8 HCOOPET + \alpha_9 EXPER + \beta + \varepsilon$

Finally, to study the interactions between the size of the focal firm and the different relational strategies and to test hypotheses H5 and H6, we created the model 3. We introduced two variables VCOOPETxSIZE and HCOOPETxSIZE to measure these interactions. To avoid any colinearity issues, we had to remove the variables VCOOPET, HCOOPET and SIZE from the linear regression. In the model 3, all our VIF are smaller than 2.

(3) $PP\ or\ TP = \alpha_1 BED + \alpha_2 BATH + \alpha_3 AGEP + \alpha_4 GAR + \alpha_5 FRAN + \alpha_9 EXPER + \alpha_{10} VCOOPET\ X\ SIZE + \alpha_{11} HCOOPET\ X\ SIZE + \beta + \varepsilon$

5. Results

The tables 2 and 3 show the results of the impact of various relational strategies on performance at the product level. More precisely, Table 2 shows the incidence of these relational strategies on price performance (PP) and Table 3 assesses the impact of these different strategies on time performance (TP).

5.1. Competition, horizontal and vertical coopetition, and price performance

Table 2 helps us to analyse our three models about the impact on price performance. First of all, our Model 1 deals with control variables. Three of them are highly significant: the number of bedrooms BED (β= -0.192; p<0.001), the number of bathrooms BATH (β= -0.294;

p<0.001) and the membership in a franchise FRAN (β=0.137; p<0.002). These results are consistent with the existing literature.

Table 2. Impact on price performance

	Price performance					
	Model 1		Model 2		Model 3	
	β	Sig.	B	Sig.	B	Sig.
(Constant)		0.834		0.179		0.176
BED	-0.192****	0.001	-0.152***	0.010	-0.138**	0.020
BATH	-0.294****	0.000	-0.341****	0.000	-0.351****	0.000
AGEP	-0.080*	0.067	-0.066	0.157	-0.067	0.145
GAR	-0.018	0.695	0.004	0.938	-0.013	0.786
FRAN	0.137***	0.002	0.187****	0.000	0.119***	0.012
SIZE			-0.129**	0.022	-	-
VCOOPET			0.061	0.208	-	-
HCOOPET			0.114**	0.026	-	-
EXPER			0.173****	0.001	0.085*	0.063
VCOOPETxSIZE					0.013	0.779
HCOOPETxSIZE					0.098*	0.062

OLS regressions, VIF<2, *p<0.1, **p <0.05, *** p <0.01, **** p <0.001

Now, the model 2 allows us to shed light on the hypotheses H1, H2, H3 and H4 with the price performance variable. First of all, it appears that the variable SIZE has a significant negative impact on price performance (β=-0.129, p<0.05). This goes in contradiction with our expectations and thus Hypothesis 1 is rejected with this measure of commercial performance. Regarding the impact of vertical coopetition (VCOOPET), we didn't expect a significant effect of vertical coopetition on price performance and our results go in this way (β=0.061, p=0.208). Consequently, Hypothesis 2 is validated using price performance as a measure of commercial performance. Concerning products sold using horizontal coopetition, we expected a significant positive impact of horizontal coopetition (HCOOPET) on price performance. Our results confirm our expectations (β=0.114, p<0.05), we can thus validate Hypothesis 3 regarding price performance. Finally, according to Hypothesis 4, firms with a longer experience of horizontal coopetition (EXPER) should have a higher price performance because they are able to extract more value to their advantage. These results are in accordance

(β=0.173, p<0.01) with our Hypothesis 4 when using price performance as a measure of commercial performance.

Finally, the Model 3 helps us to test Hypothesis 5 and 6. By creating an interaction term crossing vertical coopetition and size of the firm (VCOOPETxSIZE), results don't show a significant effect (β=0.013, p=0.779). The size of the firm does not change the impact of vertical coopetition on price performance. As a consequence, we can't validate the Hypothesis 5 with price performance as a measure of commercial performance. To conclude, we study the interactions between horizontal coopetition and size with the variable HCOOPETxSIZE. Our results indicate a positive impact (β=0.098, p<0.1), stating that the size strengthens horizontal coopetition strategies. When tested using the price performance, the Hypothesis 6 is validated but with a relatively low significant level.

5.2.Competition, horizontal and vertical coopetition, and time performance

Table 3 helps us to analyse our three models about the impact of various relational strategies on the time performance.

Table 3. Impact on time performance

	Time performance					
	Model 1		Model 2		Model 3	
	β	Sig.	B	Sig.	B	Sig.
(Constant)		0.005		0.015		0.017
BED	0.012	0.846	0.053	0.423	0.067	0.320
BATH	-0.214****	0.001	-0.236****	0.000	-0.247****	0.000
AGEP	-0.020	0.679	0.007	0.898	-0.004	0.936
GAR	0.014	0.796	-0.041	0.463	-0.051	0.364
FRAN	0.022	0.657	0.051	0.383	-0.013	0.813
SIZE			-0.127**	0.048	-	-
VCOOPET			-0.015	0.791	-	-
HCOOPET			0.182***	0.002	-	-
EXPER			0.065	0.278	-0.023	0.657
VCOOPETxSIZE					-0.058	0.286
HCOOPETxSIZE					0.138**	0.022

OLS regressions, VIF<2, *p<0.1, **p <0.05, *** p <0.01, **** p <0.001

First of all, our Model 1 deals with control variables. Concerning the Model 1 focusing on control variables, we can see that only the number of bathroom (BATH) is significant (β = -0.214; $p<0.001$).

Regarding the Model 2 for time performance, it allows us to shed light on the hypotheses H1, H2, H3 and H4. First of all, it appears that the variable SIZE has a significant negative impact on the time performance (β=-0.127, $p<0.05$). This contradicts our theoretical model and thus Hypothesis 1 is rejected using time performance as a measure of commercial performance. Regarding the impact of vertical coopetition (VCOOPET), we didn't expect a significant effect of vertical coopetition on time performance and our results go in this way (β=-0.015, $p=0.791$). We can validate Hypothesis 2 with the time performance measure. Concerning products sold using horizontal coopetition, we expected a significant positive impact of horizontal coopetition (HCOOPET) on time performance. Results are also in accordance with our expectations (β=0.182, $p<0.01$), we can thus validate Hypothesis 3 when the commercial performance is assessed through the time performance. Finally, according to Hypothesis 4, firms with a longer experience of horizontal coopetition (EXPER) should have increased the time performance too. However, our results do not show any significant relation (β=-0,023, $p=0.657$), Hypothesis 4 is thus rejected when measuring the commercial performance with time performance.

Finally, the Model 3 helps us to test Hypothesis 5 and 6. By crossing vertical coopetition and size of the firm (VCOOPETxSIZE), results don't show a significant effect (β=-0.058, $p=0.286$). The size of the firm does not change the impact of vertical coopetition on the time performance. As a consequence, when the commercial performance is measured with the time performance, we can't validate Hypothesis 5. To conclude, we study the interactions between horizontal coopetition and size with the variable HCOOPETxSIZE. Our

results indicate a positive impact (β=0.138, p<0.05), allowing us to say that the size strengthens the positive impact of horizontal coopetition on time performance. The Hypothesis 6 is thus validated in the case of time performance.

5.3.Competition, horizontal and vertical coopetition, and product commercial performance

In the two previous parts, we assessed the impact of various relational strategies on product commercial performance using two different measures for robustness checks (product and time performance). We combine these results to see whether our hypotheses are rejected, partially validated or validated whatever the measure of product commercial performance used. The results are summarized in Table 4 below.

Table 4. Summary of results on hypotheses

	Relation tested	Partial Results	Results
H1	$SIZE \xrightarrow{+} PP$	Rejected	Rejected
	$SIZE \xrightarrow{+} TP$	Rejected	
H2	$VCOOPET \xrightarrow{\emptyset} PP$	Validated	Validated
	$VCOOPET \xrightarrow{\emptyset} TP$	Validated	
H3	$HCOOPET \xrightarrow{+} PP$	Validated	Validated
	$HCOOPET \xrightarrow{+} TP$	Validated	
H4	$EXPER \xrightarrow{+} PP$	Validated	Partially validated
	$EXPER \xrightarrow{+} TP$	Rejected	
H5	$VCOOPET\ X\ SIZE \xrightarrow{-} PP$	Rejected	Rejected
	$VCOOPET\ X\ SIZE \xrightarrow{-} TP$	Rejected	
H6	$HCOOPET\ X\ SIZE \xrightarrow{+} PP$	Validated	Validated
	$HCOOPET\ X\ SIZE \xrightarrow{+} TP$	Validated	

In a nutshell, hypothesis H1 is rejected whatever the measure of the product commercial performance used. Consequently, the focal firm's size does not increase significantly the product commercial performance. Regarding the hypothesis H2, it is validated for both measures of product commercial performance. We can thus state that vertical coopetition does not impact significantly the product commercial performance. Concerning the hypothesis H3, it is validated whatever the measure used. Therefore, we conclude that horizontal coopetition increases the product commercial performance. By contrast, the hypothesis H4 is partially validated (only when the commercial performance is measured with the price performance). Consequently, firms having used horizontal coopetition for a long period show a higher product commercial performance only in terms of price performance. The hypothesis H5 is rejected with both measures of product commercial performance. Accordingly, we can say that larger focal firms using vertical coopetition don't obtain a lower product commercial performance. Finally, the hypothesis H6 is validated whatever the measure used. We can thus state that the larger the focal firm's size under horizontal coopetition, the higher the product commercial performance.

6. Theoretical implications and discussion

6.1. Coopetition and product commercial performance

The existing coopetition literature has shown mixed results regarding the performance of coopetition strategies (Kim and Parkhe, 2009; Knudsen, 2007; Luo et al., 2007; Ritala, 2009). To investigate this issue, we changed our level of analysis from the firm level to the product level in order to be able to distinguish for vertical coopetition strategies and horizontal coopetition strategies. This distinction yields interesting results because we show that horizontal coopetition increases product commercial performance whereas vertical

coopetition doesn't impact significantly the product commercial performance. This first result explains why most previous contributions were contradicting themselves as they were putting together different types of coopetition (horizontal and vertical). Depending on the share of vertical or horizontal coopetition strategies in their sample, the impact of coopetition strategies would turn out to be positive, negative or neutral.

Because we analyze coopetition at the product level, we are able to show how and why the different types of coopetition strategies lead to different outcomes. More precisely, building on the bargaining power and network exchange literatures (Easley and Kleinberg, 2010; Emerson, 1962; Willer, 1999), we managed to link coopetition strategies to bargaining power issues. We highlight that the various coopetition strategies don't have the same impact on customers. Vertical coopetition generates a transfer of distribution network from the supplier-firm to the customer-firm. In the case of vertical coopetition, there is no significant impact in terms of bargaining power for the relationship between the focal firm and the final customer. Consequently, vertical coopetition does not impact significantly the product commercial performance. On the opposite, our model and our results show that horizontal coopetition leads to combining both partners' distribution networks, increasing the competition between final customers for a given product. Therefore, horizontal coopetition increases the focal firm's bargaining power over its potential customers and thus increases the product commercial performance.

Future research on the performance of coopetition strategies should be realized at the product level in order to distinguish for various types of coopetition strategies (e.g., horizontal vs vertical). In addition, integrating bargaining power issues in future contributions could bring additional insights on coopetition theory and dynamics.

6.2.Benefits and costs of coopetition strategies for customers

This framework sheds new lights on the impact of coopetition strategies on customers. So far, the existing literature assumed that coopetition was a *win-win-win* strategy for both partners and for the final customers (Bengtsson and Kock, 2000; Brandenburger and Nalebuff, 1996; Peng et al., 2012). However, our framework shows that horizontal coopetition actually reduces the bargaining power of customers in favor of the partnering firms. At the same time, horizontal coopetition reduces the search costs for customers because they don't need any more to talk to different firms to find the product they are looking for (Brandenburger and Nalebuff, 1996). In addition, customers have access to a wider variety of products and may thus find a product closer to their preferences. As a consequence, if we have highlighted that customers pay a higher price for the products sold in horizontal coopetition, we still don't know if the value added for customers in terms of services outweighs the higher price paid.

Further research on coopetition should investigate more in details the monetary and non-monetary benefits and costs for customers associated to coopetition strategies. To analyze these issues, a detailed analysis of customers' surpluses should be realized.

6.3.Coopetition and other forms of performances

Our results show that horizontal coopetition is the only type of coopetition yielding superior product commercial performance. This conclusion confirms the idea according to which coopetition generates superior value only when the core resources shared are at the same level of the value chain (Gnyawali and Park, 2011; Ritala, 2009). At the same time, sharing key resources in horizontal coopetition generates more tensions than vertical coopetition because the risk of opportunism and appropriation is much higher (Fernandez et al., 2014, Tidström, 2014). Nevertheless, regarding product commercial performance, horizontal coopetition appears to be the most attractive strategy.

However, other types of performances need to be investigated. Indeed, a superior product commercial performance does not automatically generate a higher economic or financial performance for the firms. In horizontal coopetition, the product is sold faster and at a higher price to the final customer, but at the same time the margin may have to be shared with the partner. Consequently, the global financial impact of horizontal coopetition remains unclear.

In addition, while coopetition generates higher performance at the product level, we don't know if such a strategy should be applied to all the products of the firm. Indeed, applying horizontal coopetition to all products would mean faster sales at a higher price, but at the same time more margins given to the partners. In this case, what would be the overall impact of coopetition strategies for the focal firm? Prior research has shown that firms may need to have an optimal share of coopetition in their alliance portfolio to innovate (Park et al., 2014; Wu, 2014). Can we expect a similar result with an optimal share of products sold using coopetition for the firm?

6.4. Coopetition strategies: practice makes perfect

Another key result of our analysis comes from our study of a potential learning effect in coopetition strategies. Indeed, our results show that firms having used coopetition over a long period tend to sell products more successfully. This result sheds light on the existence of a potential learning effect regarding coopetition strategies for commercial performance, and to our knowledge, this has not be put forward previously in the literature. Similar effects have been put forward in the alliance literature with the concept of alliance experience (Heimericks and Duysters, 2007; Rothaermel and Deeds, 2006), but so far, the coopetition literature has only focused on the impact of coopetition experience on innovation (Park et al., 2014).

This result shows that in the value creation and value appropriation dilemma, the more firms coopete the better they get at appropriating value. This conclusion is supported by previous works focusing on strategic networks that showed the existence of a learning effect in the bargaining process in alliances (Dutta et al., 2003; Zaheer et al., 2000). In other words, the more firms have relied on coopetition, the more they are able to extract value for their own benefit. This outcome invites future researchers to investigate in details the modalities of a potential "coopetition capability" (Nashölm and Bengtsson, 2014; Park et al., 2014).

Finally, this coopetition experience effect invites researchers to think about a possible first-mover advantage. Our results indicate that firms using coopetition over a longer period are better at taking advantage of it. Consequently, the first firms using coopetition in a given industry will be able to extract more value from future collaborations. Coopetition would thus generate a snowball effect because all firms have an incentive to adopt coopetition strategies quickly in order to be the first on the market and learn better how to extract more value at the expense of the others.

6.5.The puzzling impact of size on coopetition's product commercial performance

Our results yield contradictory results on product commercial performance depending on the types of coopetition strategies. Concerning vertical coopetition, we expected that large firms would benefit less than small firms from coopetition strategies because they lose potential customers in the exchange of distribution networks. Indeed, larger firms tend to have a larger set of potential customers and it is less likely that their partners have, *ceteris paribus*, more customers than they do. However, our results show that vertical coopetition does not impact negatively large firms and thus contradicts our hypothesis. This surprising result can be explained by the existence of a specialization effect. Indeed, not all firms sell all types of goods and some small firms have adopted a niche strategy with a strong expertise for specific

products. Large firms may thus need to rely on specialized smaller firms in vertical coopetition not to have access to more customers but to reach a specific segment of the market. For these specific products, final customers rely only on these small firms that are well-known for their niche strategies. Consequently, in the case of vertical coopetition, future research should integrate not only the size of the partnering firms but also their specialization for specific segments and products.

Regarding horizontal coopetition, the results confirm our expectations according to which larger firms would benefit more from horizontal coopetition than smaller firms because of a multiplier effect. Indeed, in horizontal coopetition, firms combine their distribution networks and thus large firms tend to be favored compared to smaller firms. This result confirms all the conclusions of the industrial organization literature stating that large firms are able to use better their bargaining power when negotiating with their customers and other stakeholders (Porter, 1980).

6.6.Managerial implications

First, our research shows that within a coopetition network, firms do not have any incentive to adopt vertical coopetition because it doesn’t increase the commercial performance of their products. On the contrary, if a firm wants to sell faster and at a higher price its products, it has to adopt a horizontal coopetition strategy.

Moreover, coopetition is more likely to generate superior product commercial performance for large firms. Consequently, large firms should embrace more coopetition strategies to benefit from a multiplier effect in their favor.

Finally, our contribution highlights the existence of a virtuous circle. The more a firm relies on coopetition, the better it will be at it. In other words, firms must use horizontal

coopetition strategies as soon as they can in order to learn how to coopete properly and extract more value from their sales.

6.7.Limitations and future research

In addition to the limitations and research directions mentioned earlier, we identify different limitations for our study that are as many directions for future research.

A first criticism may come from the industry setting for our analysis. We justified the use of the real estate brokerage industry by the presence of different types of relational strategies that do not impact the characteristics of the product. However this industry may present many idiosyncrasies that could bias our results. We think that our results could be replicated in other brokerage industries such as the art or antique dealers. Nevertheless, we don't know to which extent these results are robust in other non-brokerage industries, and future research is thus required.

A second limitation is related to the composition of our sample. Our sample is mainly composed of small firms (most of them having less than 10 employees). The strong majority of small firms in our sample may bias the results regarding the impact of coopetition strategies on product commercial performance. Consequently, future research should integrate firms with different sizes in order to check the robustness of our results.

7. Conclusion

In a nutshell, our research generates new insights on the impact of coopetition on performance. By reasoning at the product level, we highlight that horizontal coopetition strategies increase the product commercial performance whereas vertical coopetition strategies don't. In addition, we underline that horizontal coopetition is more beneficial to large firms than to small firms. Finally, we put forward the existence of a learning effect

regarding coopetition strategies. The more firms coopete over time the better they get at extracting value at their own advantage. We are confident that our research sheds new lights on the link between coopetition and performance and we think that it opens new directions for future research.

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