

# **The impact of competitive aggressiveness on the relative supply market position of factor-market rivals**

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**ABSTRACT:** Managers usually focus on strategic actions and competitive attacks in product-markets to improve their relative market position. However, managers should also realize that they compete over resources in supply markets. This study employs literature on factor-market rivalry and competitive dynamics to build theory on the impact of competitive aggressiveness on the relative supply market position of rivals in factor-markets. This study proposes that a higher volume, longer duration, more complexity and more unpredictability of a competitive attack is positively related to the relative supply market position of the attacking firm. Using the awareness-motivation-capability framework, this study also proposes that the impact of competitive aggressiveness is higher when firms only are rivals in factor-markets, in contrast to firms that are also rivals in product-markets.

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## **Keywords**

factor-market rivalry, competitive dynamics, competitive aggressiveness, competitive actions, strategic supply management, conceptual theory building

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# 1. INTRODUCTION

The competitive position of a firm is always relative to its best rival Porter (1991). Given the increasing importance of the strategic role of suppliers in the supply chain management literature, supply management became more important for competitiveness among firms (Weele & Raaij, 2014). However, firms are still lacking experience to recognize unanticipated rivalry in factor-markets (Ellram, Tate, & Feitzinger, 2013). Pulles, Vos, and Veldman (2014) argued that supply managers should realize that they operate in markets which are shared with rivals. They stated that supply managers should plan actions to gain competitive advantage over rival firms in supply markets (Pulles et al., 2014). Pulles et al. (2014, p. 6) stated that ‘*a competitive action in a supply market can be seen as an externally directed, specific, and observable competitive move initiated by a firm to enhance its relative position in a supply market*’. In order to get a better understanding on how firms can gain competitive advantage over rival firms in supply markets, it is important to contribute to the existing literature on strategic supply management by theorizing on actions and reactions of rivals in factor-markets.

Firms are usually focused on improving strategic decisions in product-markets. However, they often are not capable to recognize signals for rivalry in factor-markets (Ellram et al., 2013). Consider the situation where two firms that operate in different product-markets need resources from the same supply market. This is a situation where firms, which Markman, Gianiodis, and Buchholtz (2009) refer to as *atypical rivals*, operate in different product-markets but are in competition over the same resources. Both firms may be unaware that they are rivals in the same factor-market, which can lead to unforeseen competition or rivalry. On the long run, these resources can become a constraint (Ellram et al., 2013). This unforeseen competition may weaken the relative supply market position of one or both of the firms. Ellram et al. (2013) give an example of the air cargo capacity in China, where firms that operate in different product-markets decided to move to China because of attractive input prices. Those firms did not foresee the scarcity of logistics capacity in later years, which eventually resulted in higher factor-costs. These kind of problems eventually forced companies to reconsider their location decisions.

This research is inspired by Ferrier (2001), who researched the impact of competitive aggressiveness on a firm’s relative performance. Ferrier (2001) conceptualized competitive aggressiveness as a sequence of competitive actions, which all together form a competitive attack. Ferrier (2001) studied the influence of four different dimensions of competitive attack on firm performance; the *volume* of a competitive attack; the *duration* of a competitive attack; the *complexity* of a competitive attack and the *unpredictability* of a competitive attack. These dimensions are explained in more detail in the next sections. Ferrier (2001) specifically focused on the influence of competitive aggressiveness on firm performance in product-markets. However, there is still much unknown about the impact of competitive aggressiveness in factor-markets, especially when the

attack comes from an atypical rival. Thus, it is still unclear what firms can do in terms of competitive aggressiveness to secure their relative supply market position, especially when there are signs of threats from unanticipated rivals in factor-markets.

This study aims to get deeper insights on how competitive aggressiveness influences the relative supply market position of firms in factor-markets. I argue that firms that operate in the same factor-markets can improve their relative supply market position as they increase the volume, duration, complexity and unpredictability of their competitive attacks.

Until now, most literature on rivalry focused on product-markets (Ellram et al., 2013) and literature on competitive dynamics is also well-defined at the output side of the value chain (Markman et al., 2009). However, applying theory on competitive dynamics to the input side of the value chain is different, because activities and factors that are involved on the input side of the value chain differ from activities concerning product-markets (Markman et al., 2009). Although Markman et al. (2009) shed light on the presence of atypical rivals and competitive blind spots, there is still a gap in the current literature on how competitive attacks influence the relative supply market position of rivals in factor-markets. The lack of this knowledge in current literature shows the relevance of a theoretical study on actions of rivals in factor-markets and consequences of actions in supply markets. Pulles et al. (2014) suggested to research the relationship between competitive actions and the change in relative supply market position. As depicted in Figure 1, this study builds on factor-market rivalry literature and competitive dynamics literature and is designed to theorize on the impact of competitive aggressiveness on the relative supply market position of rivals in factor-markets. Additionally, I argue that competitive aggressiveness attacks have a greater impact on a firm’s relative supply market position when the attacking firm is not operating in the same product-market as the defending firm.

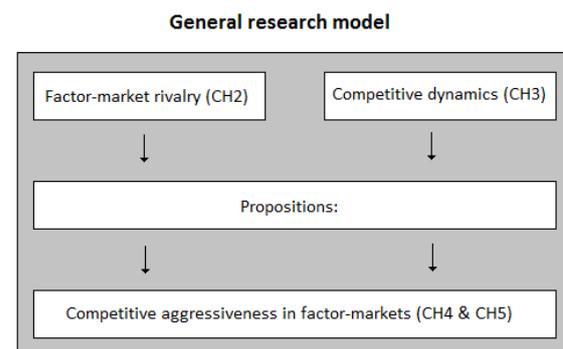


Figure 1. General research model

In order to develop knowledge on how firms can gain competitive advantage in supply markets, we need to get a better understanding on how competitive attacks influence the relative supply market position. Literature on competitive dynamics offers theory to help understand actions and reactions of rivals in factor-markets (Chen, Kuo-Hsien, & Tsai, 2007). Chen and Miller (2012) studied competitive dynamics, in which competitive profiles of

firms are reflected in their actions and reactions as they engage with rivals in the marketplace. Chen (1996) discussed the awareness-motivation-capability (AMC) framework, which can be used to analyze and predict actions and reactions of rivals in competitive markets.

The paper is structured in accordance with the general research model that is depicted in Figure 1. This section provided an introduction to show from which perspective this research is approached. The next section discusses literature on factor-market rivalry, unanticipated rivals and indicators and warning signs to recognize resources that might become subject to unanticipated rivalry in factor-markets. It also discusses the different types of actions that firms can carry out when they compete in factor-markets. The third section provides background literature on competitive dynamics, the role of perception and explains the awareness-motivation-capability-model. Furthermore it discusses how firm characteristics influence the way in which firms carry out or perceive competitive aggressiveness using current literature on competitive dynamics. After discussing the relevant literature on factor-market rivalry and competitive dynamics, I will build propositions about the impact of competitive aggressiveness on the relative supply market position of firms that are in competition in factor-markets. Finally I will argue why competitive attacks have a greater impact on the relative supply market position when firms only compete in factor-markets than when firms also compete in product-markets.

## 2. FACTOR-MARKET RIVALRY LITERATURE

### 2.1 Competition over resources in supply markets

Markman et al. (2009) argued that rivalry is not confined solely to firms that compete in the same product-markets. Bergen and Peteraf (2002) support this and argue that firms should not focus only on competitiveness in product-markets, but should also keep an eye on rivals in factor-markets. According to Markman et al. (2009) firms can have resource similarity (firms in the same factor-market), but product-market uncommonality (firm's that sell different products). Consider the example from 2001 where a telecommunication firm (Motorola), a biotechnology firm (Nanogen) and a research institution (MIT) were in competition over a technology related to molecular detection (Markman et al., 2009). The fact that the firms did not operate in the same product-market explains why the attack, which was initiated by Nanogen, blindsided Motorola and MIT. This example shows that competitive dynamics are not only important in product-markets, but can also be applied to factor-markets.

#### 2.1.1 Factor-market rivalry

Markman et al. (2009, p. 423) defined factor-market rivalry (FMR) as '*competition over resource positions*'. Ellram et al. (2013, p. 32) argued that the existing literature on FMR provides '*limited insight into anticipating rivalry that occurs when noncompetitive industries enter into common factor resource markets*'. A theoretical approach to factor-market rivalry '*makes competition more specifiable, predictable and verifiable*' (Markman et al.,

2009, p. 424) and provides a better understanding of competitive dynamics in supply markets.

#### 2.1.2 Unanticipated rivalry

Zaiaac and Bazerma (1991) argue that firms have common blind spots when they make competitive moves. If firms lack awareness of potential threats, those threats will stay unnoticed until an atypical rival makes a move which affects the market of the defending firm (Ellram et al., 2013). Markman et al. (2009) stated that in factor-market rivalry, in contrast to the resource-based view perspective, resources do not necessarily have to be valuable, rare inimitable and/or non-substitutable (VRIN). Ellram et al. (2013) mentioned the importance of recognizing unanticipated competition over non-VRIN resources in order to prevent serious consequences for firms. Markman et al. (2009) also warn for the fact that threats that are the least recognized, often have the biggest impact on firms.

Ellram et al. (2013) gave different examples of unforeseen shortages in factor-markets. We can for example look at China during the late 1990s, which became a very attractive region for firms that produce high-technology products. On the long run, the shift of all these logistic activities to that area led to a shortage in logistics, which was not foreseen by neither the local logistic partners nor the high-technology firms. We can also look at the example of Vietnam, where a tremendous increase of production plants caused enormous pressure on the port and road infrastructure (Conti, 2009). Ellram et al. (2013) showed that firms did not foresee the fact that logistics would become a constraint on the long term. This unanticipated competition over resources caused higher input costs on the long run, which had a negative impact on firm performance. In cases of shortage of inputs, the shortage can have a negative effect on the whole resource bundle, which can lead to increasing costs and decreasing services. This will negatively affect the firm's competitive advantage.

#### 2.1.3 Indicators of threats in factor-markets

Factor-market rivalry indicates that firms that operate in different product-markets are in competition over the same versatile and mobile resources (Ellram et al., 2013). The work of Markman et al. (2009) supports this and they argued that resources with certain types of attributes - specifically *versatility* and *mobility* - are more likely to attract rivals, including rivals that operate in other product-markets. Markman et al. (2009) refer to versatile resources as resources that can be used for many diverse purposes, so they are basically resources that are multifunctional. They refer to resource mobility as the extent to which a resource is maneuverable, transferable and tradable. As one may notice, the greater the versatility of a resource, which means that the resource can be used in many different industries, the greater the threat of unforeseen actions of potential rivals in factor-markets. The same goes for resources that are mobile, like for example personnel, knowledge, technology and process innovation. The greater the mobility, the greater the threat of unforeseen actions of rivals that operate in other product-markets.

Until now, most firms scan their environment within their own industry (Porter, 1979) or within their own customer markets (Barney, 1991). Ellram et al. (2013) argued that as firms becoming more active on a global scale, they also

need to look at rivals that operate in other product-markets in order to prevent unforeseen input shortages. They also argued that the application of factor-market rivalry should raise the awareness level of firms that operate in factor-markets. Firms are increasingly concerned with developing and implementing ways to identify potential threats in the markets where they operate (Ellram et al., 2013). The process of scanning of the environment involves the development of early-warning systems that can be used before entering a new factor-market or for monitoring the environment in dynamic markets. Ellram et al. (2013) provided a list of general warning signs that indicate that certain commonly used resources could be subject to competition or scarcity in the future. The list of general warnings and indicators mentions that firms should beware if ‘government statistics support double digit export growth in the region’, ‘prices are increasing in the region’, ‘wages are increasing in the region’, ‘business flights are being added in the region’, ‘suppliers mention new customers in other industries’, ‘excess capacity of productive resources is limited’, ‘government is offering tax benefits’ and ‘inexpensive land is readily available’ (Ellram et al., 2013, p. 38). These general warnings can be used to identify factor-markets which might become subject to factor-market rivalry. Firms can use this knowledge to anticipate and on potential rivalry in factor-market.

## 2.2 Firm performance in factor-markets

Competitive moves of different actors in factor-markets can influence the relative supply market position of firms. Exclusive rights to resources can benefit a firm’s position in factor-markets (Markman, Espina, & Phan, 2004). Any interruption which delays or prevents a firm to obtain the needed resources can affect the firm’s position in a product-market (Markman et al., 2009). Therefore it is important that a firm secures its relative position in a factor-market. It is not unusual that firms lure key personnel of rival firms to improve their own position in the market (Gardner, 2005). Firms do also try to sign exclusive agreements with suppliers or take legal actions against their rivals in order to slow down their rival’s activities and thereby improving their own relative position (Markman et al., 2009). We can measure the relative supply market position in terms of quantity of available resources and effectiveness of resources. The quantity of available resources concerns the firm’s production capacity if resources are fully utilized. The effectiveness of resources is the quantity that a firm can profitably produce. So if the costs per unit rise, the effectiveness of resources decreases (Capron & Chatain, 2008).

## 2.3 Application of factor-market rivalry literature

The discussed literature on factor-market rivalry provides a base for broadening existing theory and building new theory on rivalry in supply markets. This study builds on the existing literature on factor-market rivalry to develop new insights on how competitive attacks influence the relative supply market positions of factor-market rivals. I will refer back to this section when I build my

propositions. This study links factor-market rivalry to competitive dynamics, which addresses how firm’s act and react in competitive environments. Literature on competitive dynamics will be discussed in the next section.

## 3. COMPETITIVE DYNAMICS LITERATURE

### 3.1 Competitive dynamics

The literature on competitive dynamics increasingly gained importance in recent years (Chen & Miller, 2012). Chen and Miller (2012, p. 137) defined competitive dynamics as ‘*the study of interfirm rivalry based on specific competitive actions and reactions, their strategic and organizational contexts, and their drivers and consequences*’. Competitive dynamics addresses the way in which firms interact when they compete, the reason why firms compete in a certain way and how competitive behavior and organizational performance influence each other (Ketchen, Snow, & Hoover, 2004; Smith, Ferrier, & Ndofor, 2001). Competitive dynamics scholars recently started developing higher-level, more aggregate constructs for analyzing competitive attacks and there has been a growing tendency in competitive dynamics literature to investigate longer and more complex sequences of competitive actions. These studies develop theories to capture multidimensional complexities of competitive attacks (Ferrier, 2001).

Chen and Miller (2012) designate a number of essential features that characterize competitive dynamics. First, competition in the context of competitive dynamics is dynamic, interactive and consists of (streams of) actions and responses. Second, the actions and responses are considered to be carried out by firms. Third, the positions, intentions, perceptions and resources of firms and rivals are an integral part of competitive dynamics and are significant in competitor analysis. This means that a firm’s strategy and market position should always be examined relative to the strategies and market positions of its rivals.

#### 3.1.1 The AMC-framework

A very important aspect of competitive dynamics is the firm’s knowledge of itself and its rivals (Barnett, 1997; Barnett & Hansen, 1996; Greve, 1996). In order to predict the behavior and responses of rivals, it is important to understand how a competitive actions or streams of actions affects rival firms (Chen & Miller, 1994). The awareness-motivation-capacity (AMC) framework (Chen & Miller, 2012) provides theory for understanding and analyzing the behavior of rivals. Chen and Miller (2012, p. 139) explained this by stating that ‘*a competitor will not be able to respond to an action unless it is aware of the action, motivated to react, and capable of responding*’. The attacking firm can analyze the behavior and responses of rivals (e.g. likelihood and speed of reaction) using the components of the AMC model. From the attacker’s viewpoint, each of its rivals has other levels of awareness, motivation and capability, so every rival is different according to the AMC model.

According to Chen and Miller (2012), the AMC model and each of its components are strongly perceptual. They state that ‘*awareness involves perception, motivation is driven by perceptions and capability cannot lead to action unless it is perceived by managers as adequate*’ (Chen & Miller, 2012, p. 153). This means that components of the AMC model can only lead to actions or responses if managers of

rival firms perceive each other in a certain way (Porac, Thomas, Wilson, Paton, & Kanfer, 1995). Not only individual perceptions lead to actions, but also organizational identity or corporate interaction histories can influence the perception of decision makers within firms (Le Breton-Miller, Miller, & Lester, 2011). For example, the organizational identity of a firm can influence whether a firm decides to act or defend. Thus, a firm's perception determines when it feel threatened or when it feels it can ignore the rival's attack (Livengood & Reger, 2010).

### 3.1.2 Asymmetrical rivalry

Firms do not always view their relationship or interaction in a market equally (Chen, 1996; DeSarbo, Grewal, & Wind, 2006). Chen (1996) illustrated how competitive actions and reactions are asymmetrical, partly because of different levels of awareness, motivation and capability. According to Chen and Miller (2012), two rivals may not perceive every competitive action or relationship in the same way, which they refer to as asymmetrical competitive relationships between firms. They argue that firms have different perceptions and different views of their competitive relationships, which have a significant influence on the way in which firms engage in markets.

### 3.1.3 Competitive actions and reactions

Competitive dynamics scholars researched competitive response and came to the conclusion that responses were a function of three characteristics (Chen & Miller, 2012). First, the attributes of the attack, like for example difficulty of implementation, effort and time required for execution and visibility or industry attention (Young, Smith, & Grimm, 1996). Second, the characteristics of the attacker are very important, like for example the commitment of the attacker to the attack (Chen, Smith, & Grimm, 1992). Third, the characteristics of the defender, like for example the defender's dependence on competitors or whether the defenders market stake is under attack (Baum & Korn, 1999).

Research has also shown that actions that are strategic, actions that require longer execution time and actions that are less visible, are more likely to reduce the number (Chen & Miller, 1994) and the speed (Smith, Grimm, Gannon, & Chen, 1991) of rivals' responses to competitive actions. Competitor dependence and action irreversibility are positively related to likelihood of response. So if a firm is attacked in its key market, it will most likely respond to that attack. However, the firm may react relatively slow in order to show its willingness to defend its position, but at the same time show its desire to avoid escalation (Chen & MacMillan, 1992). Chen and Hambrick (1995) showed that small firms initiate more attacks and are faster with executing those attacks. However, when they are under attack, small firms are also less likely to respond and slower in execution.

Ferrier, Smith, and Grimm (1999) studied dethronement and market-share erosion of market leaders. Their study showed that market leaders are less likely to be dethroned or to experience loss of market share when they are more competitively aggressive, carry out more complex competitive attacks, and are faster in carrying out competitive actions. Young et al. (1996) showed that there is a positive relation between competitive interaction and the attacking firm's performance measured in market share gains. Smith et al. (2001) studied competitive dynamics in

30 different industries and showed the positive relationship between a focal firm's performance and the length of time taken by rivals to respond. This means that the longer it takes for the rival to respond, the better it is for the attacking firm's performance.

Ferrier (2001) conceptualized competitive aggressiveness as four characteristics of the pattern of a firm's competitive attack. Characteristics of the competitive attack are *attack volume, attack duration, attack complexity and attack unpredictability*, which will be explained in more detail in the next section.

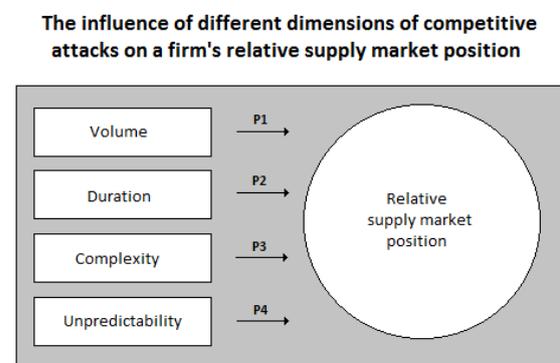
## 3.2 Application of competitive dynamics literature

Chen and Miller (2012) analyzed strategic behavior systematically by looking at the characteristics of sets of competitive actions. They looked at the attitude of firms within a competitive environment, specifically a firms' propensity to act, responsiveness, execution speed and action/response visibility. They noticed that a firms' competitive profile is represented by the firm's actions and reactions within a marketplace.

By linking existing literature on competitive dynamics and the AMC-framework to literature on rivals in factor-markets, I aim to build propositions on how competitive dynamics and factor-market rivalry influence the relative supply market position of firms in factor-markets. Applying competitive dynamics in this study, enables us to look at factor-market rivalry from a perspective that incorporates actions and reactions of firms. These actions and reactions depend on the levels of awareness, motivation and capability of firms within a competitive landscape. The next section provides a more detailed analysis of competitive actions in factor-markets.

## 4. COMPETITIVE AGGRESSIVENESS PROPOSITIONS

This section links competitive aggressiveness to factor-market rivalry. I will discuss existing literature on competitive aggressiveness (Ferrier, 2001) in order to build propositions on how different dimensions of competitive attack relate to the relative change in supply market positions of firms that are in competition in factor-markets. Figure 2 depicts how different dimensions of competitive attacks relate to the relative supply market position of rivals in factor-markets.



**Figure 2. Propositions on dimensions of competitive attacks in factor-markets**

## 4.1 Competitive attacks

Firms do often aggressively challenge and attack competitors in order to improve their relative performance (Lumpkin & Dess, 1996; Miller, 1993). Ferrier (2001) conceptualized strategy as an aggressive sequence of competitive moves and examined how sequences of competitive actions of rival firms relate to firm performance.

Competitive aggressiveness comes in the form of competitive attack, which consists of a sequence of competitive actions. Ferrier (2001) distinguishes four dimensions of competitive attack: volume, duration, complexity and unpredictability. He defines *attack volume* as the number of competitive actions of which the attack consists, *attack duration* as the number of days between the first and last action of an attack, *attack complexity* as the extent to which a sequence of actions consists of different types of actions and *attack unpredictability* as the extent to which the sequential order of competitive actions is different from earlier attacks (Ferrier, 2001).

### 4.1.1 Attack volume

The volume of a competitive attack is the simplest dimension of the attack. The volume of an attack is the total number of competitive actions of which the attack consists (Abbott, 1990). For example, the volume of a competitive attack in a factor-market can consist of a sequence of three competitive actions (e.g. *factor-market resource preemption*, *resource poaching* and again *factor-market resource preemption*). The rival firm reacts to the attack of the attacking firm by carrying out a response attack, which also consists of a number of sequential competitive actions. Prior research showed that the higher the number of actions per attack, the more competitively aggressive a firm is (D'Aveni, 1994; Ferrier et al., 1999; Young et al., 1996). Firms that carry out more competitive actions in comparison to their rivals, will exploit more opportunities and it can also discourage rivals to carry out further competitive actions (Ferrier, 2001). D'Aveni (1994) stated that firms which carry out attacks with a greater volume of competitive actions, have a greater chance to overwhelm rivals and delay their responses. Thus, by increasing the number of competitive actions in supply markets that all together form a competitive attack, the focal firm has a greater chance to improve its relative supply market position. This means that when a firm for example repeatedly preempts and poaches resources that are valuable to its rivals in factor-markets, it will exploit more opportunities to enhance its relative supply market position. The larger the volume of the attack, thus the larger the number of resource preemption and poaching efforts, the more competitively aggressive the firm is. The impact of a competitive attack on a rival firm increases as the number of competitive actions increase, which is favorable for the focal firm's relative supply market position.

**Proposition 1: Competitive attack volume is positively related to the focal firm's relative position in a supply market.**

### 4.1.2 Attack duration

The duration of a competitive attack is the time between the start of the first competitive action and the end of the last competitive action within a sequence of actions (Abbott, 1983; Ramaprasad & Stone, 1992). Firms can carry out competitive attack that have a short or long

duration. The longer a firm sustains a sequence of competitive actions (without interruptions), the more aggressive the firm will be perceived (D'Aveni, 1994). The duration of a competitive attack will probably increase when a firm carries out more competitive moves (Ferrier, 2001). The attack can result in uncertainty for rivals and rivals can become stunned or confused and so becoming less sure about how to respond (D'Aveni, 1994; Kirzner, 1973). The attack slows down the responses of rivals, which is a desirable result for the focal firm (Ferrier, 2001). This means that the longer a firm carries out a sequence of competitive actions that negatively affect the supply market position of its factor-market rivals, the more aggressive the firm will be perceived. When a firm for example carries out competitive actions that preempt its rival's resources, a short attack will not disrupt the rival firm from resource supply for a long time. However, when the focal firm increases the duration of the resource preemption, the competitive attack will probably disrupt the rival's resource supply for a longer time and this will have a greater impact on the focal firm's relative supply market positions. Thus, the longer the duration of the focal firm's competitive attack, the greater its impact on the relative supply market position.

**Proposition 2: Competitive attack duration is positively related to the focal firm's relative position in a supply market.**

### 4.1.3 Attack complexity

The complexity of a competitive attack is defined as the extent to which a sequence of competitive actions consists of different types of actions. A competitive attack is for example not complex if it consists of three of the same type of successive actions. However, the complexity increases as firms carry out more actions of different kind of types. An attack is simpler if the attack consists of less different types of competitive actions. Firms that carry out more complex sequences of competitive actions are perceived more aggressive than firms that carry out more simple sequences (D'Aveni, 1994; Ferrier et al., 1999). D'Aveni (1994) argued that when firms carry out a complex attack, consisting of many different types of competitive actions, they manage to attack their rivals at multiple fronts which can result in a delay of the rival's competitive response. Complex attacks of the focal firm can delay the decision-making process of the rival firm. The longer the delay of the rival's response, the better the relative performance of the focal firm. The delay increases at an increasing rate as the complexity of the focal firm's attack increases, because when the complexity of attacks increases, rivals find it increasingly difficult to unravel the complex attacks (Ferrier, 2001). Ferrier et al. (1999) suggest that firms that carry out more complex competitive attacks are likely to experience higher levels of performance. These results are favorable for the attacking firm and will probably improve the firm's relative position. In supply markets, firms can also attack their rivals on multiple fronts. A firm that competes over resources in supply markets can for example preempt resources in order to avoid rivals from obtaining those resources and at the same time attack its rivals on other fronts, like for instance by poaching key personnel from rivals or by filing lawsuits against their rivals. The complexity of a competitive attack increases as the number of different types of competitive actions increase. Higher complexity of a competitive attack can delay the rival's competitive response in supply markets,

which will enhance the relative supply market position of the focal firm.

**Proposition 3: Competitive attack complexity is positively related to the focal firm's relative position in a supply market.**

#### 4.1.4 Attack unpredictability

The unpredictability of an attack depends on the extent to which a sequential order of competitive actions is different from one period to the next (Ferrier, 2001). Firms that keep changing the sequences of competitive actions that they carry out, are more often able to surprise their rivals (D'Aveni, 1994; Kirzner, 1973; MacCrimmon, 1993). Aggressive firms put effort in changing their strategy to become less predictable and to surprise their rivals (D'Aveni, 1994; MacCrimmon, 1993), which slows down their speed to respond on competitive actions (D'Aveni, 1994). The delay of competitive responses increases at an increasing rate as the unpredictability of the focal firm's attack increases, because when the unpredictability of competitive attacks increases, it becomes more difficult for rivals to see patterns in the attacks, which will result in a delay in competitive responses (D'Aveni, 1994). In supply markets, attack unpredictability also increases when firms carry out different sequences of competitive actions from one period to the next. A firm can change the sequence of every attack by mixing up the sequence of competitive actions for every competitive attack and start every competitive attack from a different angle in order to stay unpredictable. A firm can for example start one competitive attack by preempting its rival's resources, and start the next competitive attack by poaching its rival's key personnel or filing lawsuits against its rivals in order to stay unpredictable in every attack. By putting effort in staying unpredictable, the focal firm makes it difficult for rivals to see patterns in competitive attacks, which will delay rivals responses. Slowing down competitive responses of factor-market rivals is favorable for the focal firm's relative supply market position.

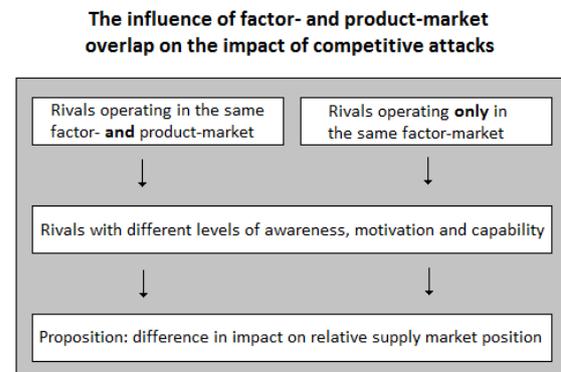
**Proposition 4: Competitive attack unpredictability is positively related to the focal firm's relative position in a supply market.**

## 5. COMPETITIVE DYNAMICS AND AMC-MODEL PROPOSITIONS

This section uses Chen and Miller's (2012) AMC research platform to systematically analyze the different drivers of awareness, motivation and capability. This enables me to build proposition on how AMC components influence competitive actions and how competitive actions impact the relative supply market position of factor-market rivals.

To better understand the perspective from which I approach this section, imagine that two rivals operate in the same product-market and both need the same factor-inputs from the same supplier. This is a situation where two firms are rivals in both the factor-market and the product-market. If one of the firms carries out a competitive attack on its rival, it would probably improve the relative supply market position of the attacking firm. Now imagine that there is a third firm, which also needs the same factor-inputs, but operates in another product-market. Imagine that the third firm carries out a competitive attack on the first two firms to improve its own relative supply market position. I argue that the if the third firm carries out such a competitive attack on the first two

firms, the impact of the competitive attack will be greater than when the first two firms that both operate in the same factor- and product-market attack each other. Figure 3 distinguishes firms that are rivals in factor- and product-markets and firms that are rivals in factor-markets only, and shows how this section's proposition is constructed.



**Figure 3. Proposition on the influence of market overlap on the impact of competitive attacks**

### 5.1 The AMC research platform

Chen and Miller (2012) consider the AMC components of the AMC-model as the three essential antecedents that affect the competitive activity of a firm: a firm's awareness of another firm's moves and responses, the firm's motivation to act or respond and a firm's capability to react or respond. Chen and Miller (2012, p. 165) developed a research platform that links micro-factors (individual-level and group-level) to macro-factors (organizational-level and extra-organizational) of the AMC model. The platform provides a base for a systematic and comprehensive treatment of competitive dynamics, specifically the AMC-model.

#### 5.1.1 Drivers of awareness

From a micro-perspective, the breadth of experience of actors within a firm has a significant influence on the awareness of different aspects of the competitive environment (Chen & Miller, 2012). Short job tenure of an actor may lead to extra caution and can result in higher levels of awareness, while longer job tenure may result in tunnel vision and lower levels of awareness (Hambrick & Fukutomi, 1991; Miller, 1992). When firms compete in the same product-markets, the cautious attitude of short job tenure actors may primarily focus on firms that operate in the same product-markets, which causes a higher awareness-level for rivals in the same product-markets, which can distract from possible factor-market rivals that do not operate in the same product-markets. Additionally, longer job tenure actor may develop more assumptions about the environment that lowers the actor's awareness-level in factor-markets, ignoring possible unanticipated rivalry and threats of competitive blind spots in factor-markets (Markman et al., 2009). I argue that this is even more likely the case if firms do not operate in the same factor-markets, because firms may not be aware of the fact that different firms that operate in other product-markets compete over the same resources (Ellram et al., 2013), especially when there is little or no overlap between product-markets.

Past experience and priorities also have a significant impact on the awareness-level of an actor (Barberis & Thaler, 2003). A firm may be more likely to perceive its direct rivals as more threatening, because past experience showed that most threats come from rivals that operate in the same product-market. This can result in firms to prioritize the possible threats of direct rivals over possible threats of atypical rivals, which can lead to more awareness in situations where firms operate in the same product-markets, but it can also lead to lower awareness-levels in situations where firms only operate in the same factor-markets.

Within a group context, awareness is influenced by information sharing, TMT demographics and diversity (Chen, Lin, & Michel, 2010; Hambrick, Cho, & Chen, 1996; Hambrick & Mason, 1984). Heterogeneous TMTs will also positively influence awareness, because they have more different sources of information that provide different perspectives on the firm's environment (Chen et al., 2010). However, when firms do not operate in the same product-markets but only in factor-markets, it is less likely that a diverse TMT will provide all necessary information in order for the firm to clearly see all indicators of threats of unanticipated rivalry in factor-markets. In this sense, it is more difficult for firms to eliminate potential threats in factor-markets. This means that if firms operate in different product-markets, it is less likely that they see a competitive attack from a factor-market rival coming, even if they have diverse and heterogeneous TMTs.

Macro-factors that influence awareness are for example organizational scanning and information systems that generates more accurate and relevant information about the environment (Aguilar, 1967; Galbraith, 1995; Tsai, Su, & Chen, 2011). Scanning and information systems are easier to set up when they only have to monitor firms that operate in the same product-market (Barney, 1991; Porter, 1979). It is more difficult to develop scanning and information systems that monitor potential rivals in factor-markets that do not compete in the same product-markets. Markman et al. (2009) argued that versatile and mobile resources are more likely to attract rivals that operate in different product-markets. So the greater the mobility and versatility of a resource, the greater the threat of factor-market rivals that operate in different product-markets.

Chen (1996) found that market commonality and resource similarity are both positively related to awareness. So, when firms operate in common markets, there will probably be a greater chance that they have higher levels of awareness of their environment. On the contrary, firms that operate in factor-markets or product-markets with little or no overlap, are less likely to have higher awareness levels about each other's environments. The same goes for companies that have similar resources. Firms that have higher resource similarity are more likely to know more about each other. From this perspective, market commonality and resource similarity influence the awareness-levels of rivals.

Another factor that is important is the position that a firm has within a network of stakeholders. A certain position

within a network determines the extent to which a firm has access to information about the environment (Granovetter, 1973; Kilduff & Tsai, 2003). When firms operate in the same product-markets and factor-markets, they are more likely to know where to look for information about each other's motivations and intentions, because they are direct rivals in product-markets and operate in the same network of stakeholders. This causes a situation where firms that operate in the same product-markets and factor-markets have relatively high awareness-levels of potential threats from their own environment. It is more difficult for firms to gather information about each other, when firms operate in different product-markets. This is because these firms have other networks of stakeholders, which makes it more difficult to access information about rival firms in factor-markets. This means that firms that operate in the same product-market and factor-market, have a higher awareness-level of each other than firms that are only each other's rivals in factor-markets.

Ellram et al. (2013) argued that firms should apply literature on factor-market rivalry to increase the awareness-level of firms that compete over the same resources. He stated that firms are increasingly putting effort in developing early-warning systems to monitor the dynamic environment of supply markets. However, existing literature on rivalry in factor-markets still provides limited insight (Ellram et al., 2013). This means that firms still face difficulties in analyzing the environment in supply-markets. The awareness-level decreases even more, when firms operate in different product-markets, because those firms have little or no knowledge about each other's intentions and motivations as they engage in supply markets.

### *5.1.2 Drivers of motivation*

Motivation can be influenced by the personality of an actor. An actor can for example be aggressive or passive (Miller & Toulouse, 1986). When a firm is passive, it will not easily initiate aggressive attacks on its rivals, but it will rather wait for its rivals to make a competitive move. More aggressive firms will be more motivated to carry out a competitive attack. However, the more the markets of two rivals overlap, the less motivated the rivals will be to initiate an attack on each other for fear of retaliation (Chen, 1996). This means that if firms operate in the same product-market and factor-market, they are less motivated to attack each other because they fear retaliation. From this perspective, firms that are only rivals in factor-market are more motivated to attack each other than firms that are also rivals in product-markets.

An actor's career stage (Miller & Shamsie, 1999) or wealth, social identity, or social status may also influence behavior (Hogg & Terry, 2000). This behavior of actors within a firm can influence the motivation of a firm to carry out competitive actions. When an actor has a significant role within a company, his social identity or status may motivate him to defend or even expand the firm goals and improve firm performance. This can result in the firm being more motivated to carry out competitive attacks on other firms to secure its position. This motivation to carry out competitive attacks can lead to a situation where

a firm looks further than its product-market and starts developing strategies to improve its position in a factor-markets.

An actor's attitude toward risk may also influence the motivation to carry out a competitive action (Dan, 2008; Loewenstein, 1996). Firms that are managed by risk seekers may be more likely to engage in uncertain markets and may be more motivated to attack firms that operate in other product-markets in order to improve their relative supply market position. Risk seekers will also be more likely to carry out competitive attacks with higher volume, duration, complexity and unpredictability, especially when factor-market rivals operate in different product-markets. On the other hand, risk averse actors will probably be less motivated to attack atypical rivals in factor-markets, because of the high levels of uncertainty that come with competitiveness in unknown markets.

There are also macro-factors that influence motivation to act. Reward systems (Kerr, 1975), corporate cultures (Martin, 1985), organizational reporting structures and accountability systems influence the motivation of decision makers to act, because these systems can enable individuals to act or to remain more conservative (Galbraith, 1995). Reward systems, corporate cultures, organizational reporting structures and accountability systems can motivate managers to carry out competitive actions in supply markets to improve the firm's relative supply market position. However, as stated earlier, the greater the overlap of factor-markets and product-markets, the greater the fear of retaliation if rivals carry out competitive attacks. Thus again, firms may be more motivated to carry out competitive attacks on firms that are only rivals in factor-markets. In this situation, awareness and understanding of motivational factors are very important in analyzing the impact of competitive attacks.

### *5.1.3 Drivers of capability*

Finally, there are different drivers that influence the capability of a firm. An actor's ability to predict actions of reactions of rivals, the competency to formulate plans, the ability to bring together all the necessary resources and the skills to execute plans are very important (Tsai et al., 2011). When a firm has the ability to predict actions and reactions of its rivals, the focal firm will be better able to initiate effective competitive attacks and defend itself from attacks from rivals. The competence to formulate plans and bringing together the necessary resources to execute the plan effectively is important because a firm's ability to act and react to competitive moves of rivals is a vital condition to survive in a dynamic environment. The ability to use the interpersonal network is also very important, because it can be used to gather the right information and advice or to gain political support (Granovetter, 1973). The ability to effectively work in groups is also very important, because it can be a great source of knowledge (Kilduff & Tsai, 2003). Bringing together the right information to carry out a competitive attack is essential because a firm can only anticipate actions and reactions of rivals when it gathers the necessary information.

There are also macro-factors that influence the capability to act. A certain industry can have certain conditions which make it difficult for rivals to enter or exit an industry (Porter, 1980). On the other hand, there are also industries with low barriers, which make it easy for potential rivals to enter the market. When factor-market rivals compete over the same resources, these barriers play a significant role, because potential competitive attacks can partly depend on which barriers a potential rival firm has to cross. Here again, awareness and understanding of rival's capabilities and environmental factors are very important in analyzing the impact of competitive attacks.

## **5.2 Significant role of awareness**

The first component of the AMC-model, awareness, plays a significant role in analyzing the impact of competitive attacks on the relative supply market position of factor-markets rivals. If we look at the second and third component of the AMC model, motivation and capability, we see that they are not independent from the awareness component. Indeed, motivation and capability are closely related to a firm's awareness-level. Furthermore, motivation to act or react does not only depend on the personality, behavior and attitude of (actors within) a firm, but also awareness of the environment and the way in which competitive attacks of rivals are perceived have an influence on the motivation-level of a firm. In addition, capability to act or react does not only depend on skills, competences or resources, because a firm is only able to act or respond if it perceives competitiveness and if it is aware of the competition (Chen & Miller, 2012). If firms lack awareness, potential threats may stay unnoticed until a rival firm makes a move which affects the focal firm (Elram et al., 2013). Markman et al. (2009) argued that the lesser a threat of a rival attack is recognized, the bigger the impact will be if the rival firm carries out the competitive attack.

Previous research on competitive dynamics showed that actions that are strategic, actions that require longer execution time and actions that are less visible, have a greater chance to reduce the number (Chen & Miller, 1994) and speed (Smith et al., 1991) of the competitive responses of rivals. This is favorable for the relative position of the attacking firm (Smith et al., 2001). Ferrier et al. (1999) argued that the more competitively aggressive a market leading firm is, the less likely it is for the firm to be dethroned or to experience loss of market share. Likewise, Young et al. (1996) showed the positive relation between competitive interaction and the attacking firm's performance measured in market share.

Using theory of competitive aggressiveness (Ferrier, 2001), which shows the relation between different dimensions of competitive attack and firm performance, I argue that the impact of a firm's competitive aggressiveness in factor-markets is greater when firms do not operate in the same product-markets. When firms have lower levels of awareness about the competitive environment, which is more likely the case when firms operate in different product-markets, they are in a more vulnerable position if they are under attack. This is because firms that operate in different product-markets, are less

likely to see a competitive attack coming from rivals that are only rivals in factor-markets. On the other hand, firms that are more aware of their competitive environment, which is often the case when firms operate in both the same factor-markets and the same product-markets, are in a less vulnerable position. This is because they have higher awareness-levels which give them a better position to anticipate rival attacks and thus are better able to defend themselves.

Building on this perspective, I argue that a certain volume, duration, complexity and unpredictability of a competitive attack in a supply market has a greater impact on the relative supply market position when firms only are rivals in factor-markets than when firms also are rivals in product-markets. This difference is more likely present due to the fact that firms that only operate in the same factor-markets are less aware of each other's motivations and capabilities to carry out competitive attacks. Thus, there is a certain surprise element that is more present when firms do not operate in the same product-markets. This surprise element, that is present to a greater extent when firms only compete in factor-markets, increases the impact of competitive aggressiveness on the relative supply market position of a firm. Thus, due to a different levels of awareness of firms that compete in both the same factor-markets and product-markets, and firms that only compete in the same factor-market, I propose the following:

**Proposition 5: Due to different awareness-levels of factor-market rivals, the impact of competitive aggressiveness of factor-market rivals on their relative supply market position is greater when rivals operate in different product-markets than when they operate in the same product-markets.**

## 6. CONCLUSION

A theoretical approach to factor-market rivalry '*makes competition more specifiable, predictable and verifiable*' (Markman et al., 2009, p. 424). The aim of this study was to make a theoretical contribution to the literature on strategic supply management using existing literature on factor-market rivalry, competitive dynamics and competitive aggressiveness. Specifically, this study discusses the impact of rivals' competitive attacks on the relative supply market position of rivals in factor-markets.

Literature on competitive aggressiveness (Ferrier, 2001) showed that the volume, duration, complexity and unpredictability of a competitive attack positively influences the relative supply market position of a firm. This means that the greater the volume, the longer the duration, the more complex and the more unpredictable a competitive attack is, the more it improves the relative position of the attacking firm. This research was constructed to theorize on the influence of attack-volume, -duration, -complexity and -unpredictability on the relative supply market position of rivals in factor-markets. This study's findings are in line with Ferrier's (2001) theory: greater volume, longer duration, more complexity and more unpredictability of a competitive attack positively

influences the relative supply market position of firms that are rivals in factor-markets.

This study also made a distinction between firms that are rivals both in the same product-markets and factor-markets, and firms that are only rivals in factor-markets. From this perspective, I investigated how this distinction related to the impact of competitive attacks on the relative supply market position in factor-markets. Perception and awareness of firms (Chen & Miller, 2012) play a significant role in the analysis of this research, because the threat of competitive attacks stays unnoticed as long as firms are not aware of the threats in their environment (Ellram et al., 2013). Building on existing literature on competitive dynamics and using the AMC-framework and the drivers for awareness, motivation and capability (Chen, 1996; Chen et al., 2007), this study concludes that the impact of competitive attacks are greater when firms are only rivals in factor-markets. These findings are in line with the findings of Markman et al. (2009), which argue that the lesser a threat is recognized, the bigger the impact will be when a rival firm decides to carry out a competitive attack.

## 7. DISCUSSION, MANAGERIAL IMPLICATIONS AND FUTURE RESEARCH

### 7.1 Discussion

This study is constructed to theorize on the impact of competitive aggressiveness on the relative supply market position of rivals in factor-markets. Although this study builds on competitive dynamics literature and factor-market rivalry literature, there are still other perspectives that provide useful insights.

First, this study did not take the nature of the sequential competitive actions into account. Although the complexity of a competitive attack was discussed, the effects of carrying out different sorts of competitive actions can give different results. For example, a firm can carry out competitive actions in the form of employee poaching or it can carry out actions that damage the rival's available resources. Both types of actions can have different effects on the relative supply market position a firm. Focusing more on the nature of the competitive actions might provide useful insights about underlying factors that determine the effect of competitive attacks on the relative supply market position of factor-market rivals.

Second, the first-mover advantage can play a role. Awareness is a very important factor, so firms can use their own awareness-level and the lack of awareness of other firms to improve their relative supply market position as they engage in factor-markets. However, the awareness-level of rivals in factor-markets may increase as they perceive increasingly more attacks from rival firms that operate in different product-markets. The former blind spots will probably become known to the firms that are under attack, so the surprise element of unforeseen rivalry might disappear. At the same time, there might rise new blind spots from which rival firms can carry out a competitive attack.

Third, the aspect of risk and perception of risk might play an important role. As firms engage in factor-markets, their competitive attacks on factor-market rivals might be subject to certain levels of risk. Risks may be manageable when firms carry out competitive attacks in their own direct environment, but competitive actions might become riskier when firms enter unknown markets and start competing with atypical rivals in factor-markets. Firms might also face higher levels of risk as they carry out more aggressive competitive attacks against their rivals, which may discourage firms from carrying out an attack. Thus, the aspect of risk has to be taken in consideration when firms carry out competitive attacks in factor-markets.

Finally, this study's theory is not specifically applicable to a certain domain or industry. The impact of competitive aggressiveness on the relative supply market position might be different from domain to domain. There might for example be different results between firms that compete over logistic resources and firms that are in competition over material resources. Thus, results may be industry- or domain-dependent and have to be taken in consideration.

## 7.2 Managerial implications

This research provides new insights for managers on how firms can engage in factor-markets, specifically concerning competitive aggressiveness. Proposition 1, 2, 3 and 4 suggest that the volume, duration, complexity and unpredictability of a competitive attack have a positive impact on a firm's relative supply market position. Managers can use these insight to effectively carry out competitive attacks on their rivals in factor-markets, in order to gain a competitive advantage over their rivals.

Further, managers should not only have high levels of awareness in their own direct environment, but more importantly, they also should have high levels of awareness of other firms in other industries that might potentially become rivals in factor-markets. For example, Amazon managed to lure away Wal-Mart's key personnel (Gardner, 2005) and Nanogen blindsided Motorola and MIT (Markman et al., 2009). As proposition 5 suggests, the impact of competitive aggressiveness in factor-markets is greater when firms are only rivals in factor-markets and operate in different product-markets. So when managers are able to anticipate on possible threats from outside their direct environment, they may be better able to avoid the rival's attack from damaging their relative market position. Also, in order for managers to improve their relative supply market position, they can use their insights to carry out effective competitive attacks on their rivals in factor-market.

## 7.3 Future research

Linking literature on competitive dynamics to literature on factor-market rivalry, provides new perspective on how future researches can be approached. This study is designed to build theory that serves as a starting point for future research.

An opportunity for future research is investigating the role of the nature of competitive actions. A more detailed

analysis of the nature of sequences of competitive actions might provide useful insights to strategic supply management literature. Competitive actions like for instance employee poaching might have a different influence on the relative supply market position than competitive actions concerning material resource preemption (Capron & Chatain, 2008). The nature of competitive actions may depend on the type of domain or industry in which firms operate. Conducting studies for specific domains and industries might provide more specific insights on competitive dynamics and competitive aggressiveness in factor-markets. Some domains depend on logistics (Ellram et al., 2013), while other domains may depend more on knowledge and employees (Gardner, 2005). Domain- or industry-specific studies can provide useful information for firms that operate in factor-markets and might provide clearer implications for managers in specific domains.

Furthermore, first-mover advantage is an interesting concept that can be integrated in future research. As awareness and the surprise element of factor-market rivals play a key role in this study's analysis, theory on first-mover advantage might provide new insights. Suarez and Lanzolla (2007) investigated the relationship between a firm's environment and first-mover advantage. An opportunity for future research might be to investigate to which extent the first-mover advantage plays a role in factor-market rivalry, especially when firms operate in different environments and product-markets.

Finally, Ellis, Henry, and Shockley (2010) built on Zsidisin's (2003) work on supply risk and incorporated behavioral risk theory into the study of supply risk. Taking behavioral risk and buyer perceptions into account while analyzing the impact of competitive aggressiveness on the a firm's relative supply market position may provide new insight about the relationship between competitive attacks in supply markets and the risks that firms perceive and take when they carry out those attacks.

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