

Research And Methods In Competitive Dynamics: Review And Perspectives

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EURAM 2012***TRACK 66. RESEARCH METHODS AND RESEARCH PRACTICE GENERAL TRACK*****RESEARCH AND METHODS IN COMPETITIVE DYNAMICS:
REVIEW AND PERSPECTIVES**

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Abstract: The authors compute a meta-method analysis and content analyze 74 empirical articles citing ten seminal articles in competitive actions research. This metastudy presents, in a descriptive perspective, methodological strengths and weaknesses, justifications and choices of articles published in top academic journals. The study details the importance of methods in competitive dynamics research and proposes new methodological process or guidelines.

Keywords: competitive dynamics research; competitive action; research methods; metastudy; meta-method analysis.

INTRODUCTION

Competition is a central element of strategy since it influences firm's economic performance (Porter, 1980). This topic has long been studied by strategy researchers (Caves & Porter, 1977; Harrigan, 1980; Porter, 1980; Porac & Thomas, 1990) but largely within a static viewpoint (Porter, 1981; Smith *et al.*, 1991). There are indeed two conceptions of competition, "*one emphasizing on the structure of the market, one emphasizing the conduct of the firms*" (Baum, 1996, p.255). This paper is concerned with the second one, known as competitive dynamics research and rooted in the Austrian School of Economics (Schumpeter, 1934).

Market is conceptualized as a dynamic processes (Schumpeter, 1934), a flux of firms' competitive actions and responses (Smith *et al.*, 1992) undertaken to achieve competitive advantage (Porter, 1980). This body of work has rapidly developed in the strategic management field since the beginning of the 1990s. Many empirical studies have been conducted allowing a far better comprehension of competition phenomena (Smith *et al.*, 2001; Ketchen *et al.*, 2004; Chen, 2007).

As in many areas, the method is of a central issue. It is all the more important than this stream of research operated deliberately a breakthrough with previous competition research methods (Smith, Grimm and Gannon, 1992), choosing a fine-grained observation of firm competitive behaviors (Smith *et al.*, 1991; Smith, Grimm & Gannon, 1992; Smith *et al.*, 2001). Methodological accomplishments are often emphasized (Hoskisson, 1999; Smith *et al.*, 2001; Fuentelsaz & Gomez, 2006). However, competitive dynamics research methods have rarely been systematically examined. Paying attention to methods is fundamental for making progress in strategic management research (Venkatraman, 2008) and increasing confidence in its findings (Ketchen *et al.*, 2008). Our paper's first goal is to address a comprehensive review

and an in-depth analysis of methods used in competitive dynamics research. It differs from previous works by both its focus on methodological issues opposite to both conceptual and methodological ones (Ketchen *et al.*, 2004; Smith *et al.*, 2001; Noienanken, 2008) and its sampling and analysis choices (Smith *et al.*, 2001; Ketchen *et al.*, 2004; Noienanken, 2008; Hutzschenreuter & Grove, 2009). We developed a specific coding scheme and carefully coded a sample of 74 high-impact empirical studies published between 1990 and 2010.

The second goal of this paper is to outline guidelines for methodological improvement and design methodological perspectives taking into account both the methodological approaches which have already been experimented and several calls for better understanding managerial decision-making antecedents to competitive behavior (Smith, 2001; Chen, 2007).

The article is structured as follows. In a first section, we will briefly describe competitive action, present an historical and thematic overview of competitive dynamics research and detail early methodological considerations and major methodological issues in the field of competitive dynamics research. Then we will focus on ten seminal contributions that we will describe and use to ground our metastudy. In a second section, the methodology will be developed. We will detail the research design, the articles collection and coding process of our meta-method analysis. In the third section, we will present the main findings in terms of sampling, methods and time framing in the field of competitive dynamics research. Finally, contributions will be discussed, limitations and futures avenues will be described.

BACKGROUND

Competitive action as the hard core of competitive dynamics research

Without being defined in a consensual way (Noienanken, 2008), the notion of action is in the hard core of competitive dynamics research, the so-called *action perspective* (Smith *et al.*, 1997). Its focus on competitive action is consistent with its theoretical foundation in the

Austrian School of Economics (Smith *et al.*, 1992; Smith, Ferrier & Ndofor, 2001). In the Austrian's view, earning profits is supported by entrepreneurial discovery which is therefore at the heart of strategic choices. Entrepreneurial discovery concerns many activities from adopting a new source of supply of material to exploiting a new technological possibility (Jacobson, 1992). Firm's successive discoveries constitute the market process itself (Schumpeter, 1934; Kirzner, 1979; Jacobson, 1992). Competitive dynamics scholars view competitive action as a vehicle for entrepreneurial discovery and competition as an exchange of competitive actions undertaken by firms in order to defend or improve their competitive position (Smith *et al.*, 1992; Smith, Ferrier & Ndofor, 2001). Focusing on competitive actions is therefore a requisite for understanding competition.

An historical and thematic overview of competitive dynamics research

Early competitive dynamics research focused on individual competitive actions and the responses (from competitors) they may trigger (Ketchen *et al.*, 2004; Smith, Ferrier & Ndofor, 2001). Following Caves's appeal (1984), the action-reaction dyad is considered as the basic unit of analysis of competitive dynamics (Smith *et al.*, 1992). It is "*at this level where competitive engagement occurs*" (Chen *et al.*, 1992, p.541) and competitors's interdependence can be best observed (Porter, 1980). There have been important advances on the characteristics of competitive actions and firms that influence the likelihood and speed of competitor's responses and their consequences (Ketchen *et al.*, 2004; Smith, Ferrier & Ndofor, 2001). These outputs can help strategists to predict rivalry, which *is* crucial since it has an impact on firm's performance (for a review, see Smith, Ferrier & Ndofor, 2001).

After this first period dedicated to individual actions, several competitive dynamics scholars (Miller & Chen, 1996; Ferrier, 1999; Ferrier & Lee, 2000; Ferrier, 2001), got interested in the whole competitive behavior of the firms (Smith *et al.*, 2001). Consistent with

the view of strategy as a series of actions (Kirzner, 1973; MacGrimmon, 1993), they focused on the whole set of competitive actions undertaken by firms in a finite time period (Smith *et al.*, 2001). Research in this area confirmed the influence of competitive behavior on performance and also conceptualized important characteristics of firm's competitive activity such as simplicity, complexity, duration (Ferrier, 2000; Ferrier & Lee, 2000).

In the two first areas of research, competition takes place almost implicitly on one single market. Scholars also studied competitive dynamics across multiple markets (Hoskisson, 1999; Smith, 2001; Ketchen *et al.*, 2004; Hutzschenreuter & Grove, 2009). The theory of multi-point competition has first been developed in Industrial Organization (IO) economics (Hoskisson, 1999). Economic scholars have for long examined firms competing in two or more product categories or markets and tested the mutual forbearance hypothesis formulated by Edwards (1955). Competitive dynamics scholars followed them in a dynamic perspective (Smith *et al.*, 2001).

Much more is known about the antecedents and the consequences of competitive behavior (Smith, 2001; Hutzschenreuter & Grove, 2009). But scholars have mostly focus on objective and structural factors (Chen, 2007). There have recently been several calls for exploring in-depth organizational attributes such as path dependencies (Hutzschenreuter & Grove, 2009) and affective, psychological cognitive processes that may influence managers's decision making and therefore firms competitive behavior (Smith *et al.*, 2001; Chen, 2007; Livengood & Reger, 2010). Combining different competitive dynamics area of research with other themes such as strategic groups or regional clusters (Ketchen *et al.*, 2004) and going further in theoretical foundations are also (Smith *et al.*, 2001) are also future research direction.

Research methods in competitive dynamics research

Early methodological considerations. Early competitive dynamics scholars dedicated a whole chapter on methodological issues in their founding book (Smith *et al.*, 1992). They carefully examined alternative methodologies for studying actions, from *primary methods* (such as case studies, survey or interviews) to *secondary methods* relying on archival data. All of them appeared to have strengths and weaknesses as regards to the validity and reliability of the measures of competitive actions and responses, the time perspective and the cost of the empirical work. But none of them, taken separately, seemed to meet all the requirements. This is the reason why Smith and his colleagues (1992) addressed a call for multiple methods or triangulation. Following McGrath's horseshoe of the evolution of scientific progress (1964), they opted for various methods within the same study but in different empirical research reported in their seminal book. As for one of them, the authors conceived a new methodological approach using, for the first time, a structured content analysis (Jauch *et al.*, 1980) of an industry publication in order to identify competitive actions and responses. Data were then analyzed with quantitative tools. This design, which combines successively qualitative and quantitative methods, has been largely used ever since (Smith *et al.*, 2001; Boyd *et al.*, 2008).

Major methodological issues. Competitive dynamics research methods have changed since the early beginning (Smith *et al.*, 2001; Fuentelsaz & Gomez, 2006). Whatever the area of research, most of the empirical works are marked out by their large samples of observations (Hoskisson, 1999; Smith *et al.*, 2001; Nokelainen, 2008) and their longitudinal design (Smith *et al.*, 2001; Fuentelsaz & Gomez, 2006). When challenging competitive dynamics research methods, scholars mostly center on data quality (Smith *et al.*, 2001; Nokelainen, 2008; Hutzschenreuter & Grove, 2009) and statistical techniques (Ketchen *et al.*, 2004; Fuentelsaz, 2006; Hutzschenreuter & Grove, 2009). None of these topics are surprising.

The refinement of models combined with large samples and longitudinal design request more and more advanced statistical treatments (Fuentelsaz & Gomez, 2006). As for the data issue, it refers to one of the main methodological difficulties met by researchers since the beginning: observing competitive behavior and rivalry (Smith *et al.*, 1992).

Researchers have several alternative ways for identifying competitive actions and responses indeed. They can collect primary data through interviews (Smith *et al.*, 1992). But one of the well-known data source bias inherent in qualitative methods is more susceptible to be high in competition studies. No longer managers are prone to subjectivity but they might deliberately or not provide inaccurate responses because they consider competition as a sensitive and confidential issue (Smith *et al.*, 1992).

As mentioned previously, scholars can also identify actions and reactions through the content structured analysis of press or archival data. This approach, initially developed for the action-reaction dyad studies, has also been used for multimarket competition research (Fuentelsaz & Gomez, 2006). It offers a more direct appraisal of competitive behavior and rivalry (Fuentelsaz & Gomez, 2006) than proxy approaches researchers used to opt for. However, when considering press source in particular, this approach presents several limited. Press do not necessarily cover systematically all competitive moves on a market: spectacular or well-known firm competitive actions may receive a better media coverage than other competitive moves (Nokelainen, 2008). Competitive events reported in press are not always competitive moves; they may have no intent indeed (Gnyawali *et al.*, 2008). Moreover, journalists may misinterpret whether competitive moves are reactions or not (Boyd & Bresser, 2008). This media selection bias influences all the more the validity of data on reactions as the identification process is supported by using keywords such as “in responding to”, “following”, “match”, “under the pressure of” and “reacting to”. Some scholars choose in consequence to

identify reactions focusing on mimetic moves (Boyd & Bresser, 2008). This approach is restrictive considering the broad range of competitive reactions.

Ten seminal contributions

Reading several reviews of competitive strategy and dynamics literature (Hoskisson, 1999, Smith *et al.*, 2001; Stephan *et al.*, 2003; Ketchen *et al.* 2004; Nokelainen, 2008), we draw up a set of seminal publications which are pioneers and have had major theoretical or methodological contributions to the field.

Dynamics of competitive strategy (Smith *et al.*, 1992) is commonly admitted as the foundation of competitive dynamics research. This book is the outcome of seven years of research. The authors expose the theoretical model underlying competitive dynamics and methodological guidelines for empirical studies. This theoretical groundwork has been developed in several directions. Chen (Chen *et al.*, 1992; Chen, 1996) pointed the three drivers of firm competitive behavior (awareness, motivation and capabilities). Moreover while advancing two firm-specific concepts (market commonality and resource similarity) as predictors of rivalry, he bridged the basic model of competitive dynamics with multimarket competition which was first introduced by Karnani and Wernerfelt (1985) in the strategy literature. As for scholars focusing on the whole competitive activity of the firms, they develop model (Young *et al.*, 1996), constructs or attributes to compare firms (Ferrier *et al.*, 1999; Gimeno & Woo, 1996) or assess their competitive behavior (Miller & Chen, 1994; Miller & Chen, 1996). Several scholars are also well-known for their methodological contributions, in particular regarding multimarket competition area of research (Baum & Korn, 1996; Gimeno & Woo, 1996) which requires large-scale studies.

Insert Table 1 about here

These seminal publications have been the references for many empirical studies conducted ever the beginning of the field (Smith *et al.*, 2001).

METHODOLOGY

Research design

The overall aim of this study was to synthesize and analyze the methodologies used in competitive action research through a metastudy. Finfgeld (2003) defined metastudy as an “*inductive research approach involving the analysis and interpretation of theory, methods, and research findings across qualitative studies, and the synthesis of this work to formulate new interpretations*”. Among metastudies approaches, Zhao (1991) proposed a typology of three metastudy components: meta-theory, meta-method and meta-data analysis. In our research, a meta-method was applied, focusing on methodological strengths and weaknesses, justifications and choices (Paterson, 2001) in order to propose new methodological process or guidelines. This analysis was conceived in a descriptive perspective (Finfgeld, 2003; Schreiber, Crooks & Stern, 1997) using a collating (i.e codifying) process of methods.

Articles collection

Literature search is an essential step in metastudies (Finfgeld, 2003). Nonetheless there is no consensus to define the best or most appropriate data sources or data collection process (Finfgeld, 2003). We identify articles using the Institute for Scientific Information’s (ISI) relational database which is the existing major source of citation information (Podsakoff *et al.*, 2005). This database do not consider book citations, our study is grounded on the idea that academic journals make an important vector of scientific research spreading, especially in social sciences for which per reviewed journals have a better recognition than books (Mingers & Harzing, 2007) and frame an interesting way to apprehend a research field. Nevertheless,

taking into account the theoretical and methodological contributions of the foundation book of the field (Smith *et al.*, 1992) was essential for the validity of our metastudy. That is why we chose to replace it by an article published in particular by the authors of the book (Smith *et al.*, 1991) and including both the theoretical premise of the competitive dynamic model and one of the empirical studies exposed in the book.

To be included, an article had to be cited at least one the ten seminal papers and been published between 1991 and 2011. Our starting date is dedicated by the time when the basic model underlying competitive dynamic research has been conceived in the early 1990's (Smith, Grimm & Gannon, 1992). Moreover, only a few empirical studies were done before (Smith *et al.*; 2001, Ferrier, 2001).

The database search returned 652 articles. We included those that met the four following criteria: 1) Been published in top influential and ranking academic journal because the rigor of their review process is a guarantee for the scientific quality of the research (Podsakoff *et al.*, 2005); 2) Involved empirical research 3) Dealt with the theme of competition; 4) Been consistent with the theoretical foundations of competitive dynamics research. As for the third criteria, we draw up from three main references (Porter, 1980; Barney, 1981; Ketchen *et al.*, 2004) a list of keywords which refer to competition and look for them in the abstract of the articles. The dataset was doubled-coded using a coding scheme described in Table 2.

Insert Table 2 about here

Coding process

To our best knowledge, there is not any available methodological coding scheme dedicated to competitive dynamics research. However, in strategy and management research, some methodological issues are common to all areas of research (Ireland, 2005). Thus, we built a specific coding scheme taking into account both prior investigations of strategic management methodologies and the methodological considerations we reported previously as regards competitive dynamics research.

Ketchen and Bergh's six-volume book on "*Research Methodology in Strategy and Management*", illustrates the broad range of methodological issues in the field. It covers three main dimensions: the philosophy and logic of the research, the techniques for data analysis and the conduct and practice of research. We choose to draw aside philosophical and practice dimensions consistent with the major issues on competitive dynamics research as mentioned before. Given this choice, taking support on two recent and general feature articles on strategy and management research methods (Hitt *et al.*, 2004; Ketchen *et al.*, 2008), we establish a first list of categories. It included six main categories: design, sampling, time frame, data, measurement, analysis techniques.

We developed a coding grid including for each category, subcategories and modalities of coding. We added systematically an example to reduce ambiguity and ensure uniformity of coding. The coding grid presented in Table 3 was built over several iterations. We began the coding process when the coding scheme was stabilized. We defined subcategories and coding values taking primarily into account methodological considerations and issues that are specific to competitive dynamics research. As an example, we create within the category *sampling*, the subcategories country and industry, as regards to the call for larger sample of industries (Smith *et al.*, 2001). The category *sources* contains likewise three subcategories

(data nature, data sources, identification process) in order to take into account methodological weaknesses pointed out as far as data are concerned (Noikelainen, 2008).

FINDINGS

The findings are structured as follows. We first describe the selected articles. Gathered with the empirical seminal papers, they form a representative sample of high-quality empirical competitive dynamics research. The analysis of this set of publications is presented in a second time.

 Insert Table 3 about here

Overview. Articles selected were published in the various journals as follows: 21 of them in *Strategic Management Journal* (32%), 17 in the *Academy of Management Journal* (26%) and 28 (42%) either in *Administrative Science Quarterly*, *Group and Organizational Management*, *Journal of Business Research*, *Journal of Business Venturing*, *Journal of International Business Studies*, *Journal of Management*, *Journal of Management Studies*, *Management Science* or *Organization Studies*. They are not spread over equally along the period. We observe a growth in the volume of articles devoted to competitive dynamics research: 31 articles selected (47%) were published between 1992 and 2004, 35 in a nearly half-time-window 2005-2011(53%). Competitive dynamics research benefitted from an increasing interest from scholars (Ketchen *et al.*, 2004) and/or gained in popularity in high-impact journals. As shown in Table 4, this trend is supported by the area of research dedicated to the competitive activity of the field. 28 of the publications (43%) cite more than 4 of the ten seminal articles.

Insert Table 4 about here

The set of 74 empirical studies was analyzed summing the main coding values and conducting in-depth analysis. The descriptive analysis is summarized in Table 3. Findings are organized to address the three main following methodological issues: sampling, method including design and data, time framing.

Sampling. The analysis reveals that 52 empirical studies have been conducted within a single industry. When not, the same competitive phenomena is observed either on several well-identified industries as pioneered by Ferrier and his colleagues (Ferrier et al., 1999) or on undifferentiated industries. The study of the influence of institutional ownership on competitive action (Connelly *et al.*, 2010) is an example of the latter case; researchers observed all dual-firm competitive rivalries between firms in the *Fortune 500*.

As regards single industry studies, 23 (41%) of them were conducted choosing the U.S. domestic airline industry. This industry was selected in early and seminal research because it offered both a well-known competitive context, identifiable boundary and set of competitors, and a rich source of public information (Smith et al., 1991). As shown in Table 5, the range of new industries such as banking, informatics, hospital, automobile has developed over time.

Insert Table 5 about here

The diversification of sampling is also noticed as for the geographic boundary of markets and firms. In 55 empirical studies (75%), competitive behavior or rivalry are observed regarding US markets or firms as it used to be in earlier research. In the other

studies, the authors sampled European firms (six papers), Asian firms (eight papers) or global players engaged in international competition (seven papers). Most of them (84%) were carried out after 2002.

Method. There is an increasing interest and calls for mixed method design in organization and strategy research (Hitt *et al.*, 1998; Molina, 2011). Neither the definition of this type of methods which incorporates both qualitative and quantitative approaches, nor their classifications are yet stabilized (Johnson, 2007). Combining three typologies (Greene *et al.*, 1989; Tashakkori & Teddlie, 1998 and Creswell, 2009) with the usual distinction between the nature of data (primary or secondary), we could examine complementary criteria in the empirical studies methods. Tashakkori & Teddlie (1998) exposed a typology of seven types of mixed methodologies. The more often, studies using mixed methods could be defined as “Mixed type I: qualitative data and statistical analysis in a confirmatory investigation perspective”. Greene *et al.* (1989) proposed a conceptual framework for mixed-method designs, distinguishing the triangulation (“seeking convergence, corroboration, correspondence of results from the different methods”); the complementarity (“seeking elaboration, enhancement, illustration, clarification of the results from one method with the results from the other method”); the development (“seeking to use the results from one method to help develop or inform the other method”); the initiation (“seeking the discovering paradox and contradictions that lead to the research questions being reframed”) and the expansion (“seeking to extend the breadth and range of inquiry by using different methods for different inquiry components”). Finally, Creswell (2009) separated three research designs, they could be sequential (“seeking to elaborate or expand on the findings of one method with another method”); concurrent (“converging or merging quantitative and qualitative data in order to provide a comprehensive analysis of the research problem”) or transformative (“using

a theoretical lens as an overarching perspective within a design that contains both quantitative and qualitative data”).

Virtually all (97%) of the empirical studies are conducted within a confirmatory investigation perspective (Tashakkori & Teddlie, 1998). However, their design varies as follows: 43 used complementary and sequential mixed methods (58%), 29 pure quantitative methods (39%), 2 pure qualitative methods (3%). As seen in Table 6, the category of design appears to be different according to the area of research.

 Insert Table 6 about here

Our analysis of data is focused on data collected in order to observe competitive moves. We did not consider data regarding other market or organization phenomena such as the evolution and the structure of the market, the Top Management Team attributes. As for observing competitive actions, the data collected are secondary data in most of the research (87%), both primary and secondary data in only 3 studies (4%), primary data in 7 research (7%). In this latter case, all of them have been published after 2000 and they focus either on competitive activity or on individual competitive actions. Scholars collect data conducting survey and conceive new measurers of main competitive constructs such as aggressiveness (Lin & Chin, 2004; Chen *et al.*, 2010).

In 24 of the 29 empirical studies (83%) using pure quantitative methods, scholars collect data from public databases belonging to industrial or professional organisms such as Spanish Savings Banks Confederation. (Fuentelsaz & Gomez, 2006), the North Carolina Biotechnology Industry (NCBI) (Anand *et al.*, 2009). The other pure quantitative studies are survey-based Top Management Team research.

All of the 43 mixed method studies combining successively a qualitative and a quantitative method. 38 of them (88%) have a very similar methodological approach combining, as conceived by early researchers (Smith *et al.*, 1992), a structured content analysis (Jauch *et al.*, 1980) of press data and the use of quantitative analysis tools. Press data came generally from industrial and professional papers well-known by the managers. They differed in two main topics: the way of identifying competitive actions and the validation of the identification process. Actions were identified in data press either with a keyword selection (17 studies) or directly reading the article. As for 5 publications, there was no detail. When explained, the validity of the identification process was tested using alternative double coding (10 studies) or sources of data (9 studies). As for validating data sources, scholars cross checked a sample of actions in order to test the comprehensiveness of the press publications they have chosen. They did not measure the awareness of these industrial publications among managers. Moreover, there was no validity test of the identification process in more than half of the studies.

As for concluding our analysis of mixed method studies, excluding press sources, we may report almost several particular alternative data sources. Chen and his colleagues used an experiential simulation combined with in-depth fieldwork for examining the motivations of firms in engaging in competitive moves in particular types of markets (Chen *et al.*, 2010). Participants were master-level students. Semadeni and Anderson (2010) evaluated the firms and offered attributes influencing imitation behavior using a keyword search for analyzing the description of available offers in U.S. Trademark database (Semadeni & Anderson, 2010).

Time framing. Time is of central importance in competitive dynamics research since competition is conceptualized as a process. Moreover the timing of competitive moves or countermoves actions has been shown to impact the performance of the firms (Ferrier, 2001). Our analysis of temporal dimensions of competitive dynamics research confirms the

predominance of longitudinal data consistent with several calls for longitudinal studies (Smith et al., 1992; Ketchen *et al.*, 2004). Only 6 studies (8%) present cross-sectional data. None of them focus on multimarket competition.

The average time window of longitudinal studies is of 8.35 years (std = 4.73), varying from 2 to 23, excluding a few exceptions between 40 and 88 year. Aside a few exceptions (Rindova *et al.*, 2010; Turner *et al.*, 2010), the time-unit is one year in all the studies. Despite the temporal dimension method, little attention appears to be paid to issues such as time lags and variables duration which are major time-topics when testing casual effects (Mitchell & James, 2001) or time unit. As explained by Mitchell & James (2001), we can appraise the implicit dimensions of time through the research design (definition of the model), the timing of measurement (how to define the lag between measurements to capture the exact length of the causal lag), the frequency of measurement (how often to measure to capture different types of changes over time) and the stability (how to appraise changes in the assessment of a variable over time). Contrary to the choice of the observation period, the choice of time window and time-unit is rarely justified.

A final point should be made regarding the analytical tools. If most of the articles used sophisticated panel data analyses, it appeared more as a technical and econometric issue (to insure non biased estimators) as a time issue or thoughtful longitudinal approach. Moreover, some research presented a longitudinal sample without clearly specifying how time was taken into account in this analysis (assuming it was).

DISCUSSION

Competitive dynamics research contributes to the understanding of firm's behavior in the changing economy (Ketchen *et al.*, 2004). As such, it is an important concern for both researchers and managers and should remain so. As in many strategic management research

areas, methodological issues are critical (*Hitt et al.*, 2004; *Ketchen et al.*, 2008). As for competitive dynamics research, these issues were carefully examined at the very beginning of the research (*Smith et al.*, 1992).

The goal of our research was to address a comprehensive review of methods used in competitive dynamics research and to outline design methodological perspectives. We gained deeper knowledge in the various methodological choices operated by competitive dynamic scholars across the research area and over time. Using a meta-method (Finfgeld, 2003), we documented methodological issues within a comprehensive way as far as both publications review and coding scheme are concerned. No prior research (*Smith et al.*, 2001; *Ketchen et al.*, 2004; *Hutzschenreuter & Grove*, 2009) has provided before such an in-depth analysis related with the main methodological issues in management and strategy research (*Hitt et al.*, 2004; *Ketchen*, 2008). Moreover, thanks to our publication sampling choice, we should have examined high-quality designs of research.

Competitive dynamics scholars appear to have reached earlier methodological challenges, in particular in examined competition within a fine-grained analysis (*Smith et al.*, 1992). Only a few of the whole studies did not capture directly competition behavior but used proxy variables instead. Researcher's choices were also consistent with several previous methodological calls for new samples of markets and firms and longitudinal designs (*Ketchen et al.*, 2004) as regards the complexity of the industrial context (*Smith et al.*, 2001). The sampling of competitive dynamics research is diversifying: as mentioned previously, new industries such as hospital, pharmaceutical, services and global players in multimarket context have been observed. The predominance of US markets may be explained by the sampling of our research. Our results also outline critical methodological challenges. They can be differentiated at almost two levels: the validity of data and the temporal dimension of the research.

First, earlier researchers examined very carefully the alternative methods for identifying actions and reactions. Their call for triangulation (Smith et al., 1992) has not really been followed. As mentioned earlier, the validation of data was relatively poor. Reading carefully all the publications, we did not find the previous careful exam of the validity of the data source (Smith *et al.*, 1991; Smith *et al.*, 1992) and the key informants in the industry as it was conducted on the airline industry (Chen *et al.*, 1993). When research designs were mixed, they were generally complementary sequential mixed (Greene *et al.*, 1989). They do not seek convergence, corroboration, correspondence of results as triangulation sequential mixed design do (Greene *et al.*, 1989). Lastly, the various design (qualitative, quantitative, mixed) do not appear to be used within the field as earlier researchers expected to, following McGrath's horseshoe of the evolution of scientific progress (1964). Our analysis confirms the crucial methodological data issue in competitive dynamics research as recently outlined (Hutzschenreuter & Grove, 2009). The solidity of the results depending on the methodological practices in the field (Ketchen *et al.*, 2008), as for us, it should be a priority in a future research agenda.

This research agenda could include the second methodological challenge our results highlight. Time is essential in competitive dynamics research since competition is considered no longer as static but as a dynamics process. Most of the empirical studies we analyzed have a longitudinal design. Nevertheless, many methodological time-focused issues such as time-lag, time window, variable stability (Mitchel & James, 2001) were poorly examined or taken into account into competitive dynamics research. Deepening temporal analysis should both increase the validity of the results and develop new research questions (Ancona et al., 2001).

Our study is not immune to several limitations, in particular as far as our search choices. We excluded articles on competitive dynamics research in many publications or books which may have provided examples of methodological approaches we could not

examine. The metastudy could be extended to a larger selection of journal. Nevertheless, our study helps dress a methodological research agenda within competitive dynamics research.

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TABLE 1
Description of the Ten Seminal Contributions in Competitive Action Research

#	Seminal Papers	Cited WoK ⁽¹⁾	Cited Sample ⁽²⁾	Research area	Pioneer	Methodological Contributions	Theoretical Contributions
1	Karnani & Wernerfelt (1985). Multiple Point Competition. <i>SMJ</i> .	94	20	Multimarket Competition	Hoskisson (1999)		Hoskisson (1999) Stephan (2003)
2	Smith, Grimm, Gannon & Chen (1991). Organizational Information Processing, Competitive Responses, and Performance in the U.S. Domestic Airline Industry. <i>AMJ</i> .	131	31	Action-Reaction Dyad	Smith et al. (2001) Nokelainen (2008)		Hoskisson (1999) Smith et al. (2001)
3	Chen, Smith & Grimm (1992). Action Characteristics as Predictors of Competitive Responses. <i>MS</i> .	118	35	Action-Reaction Dyad	Smith et al. (2001)		Nokelainen (2008)
4	Miller & Chen (1994). Sources and Consequences of Competitive Inertia: A Study of the U.S. Airline Industry. <i>ASQ</i> .	197	25	Competitive Activity	Smith et al. (2001)	Smith et al. (2001)	
5	Baum & Korn (1996). Competitive Dynamics of Interfirm Rivalry. <i>AMJ</i> .	106	24	Action-Reaction Dyad		Smith et al. (2001) Stephan (2003)	Hoskisson (1999)
6	Chen (1996). Competitor Analysis and Interfirm Rivalry: Toward a Theoretical Integration. <i>AMR</i>	237	33	Multimarket competition			Hoskisson (1999) Smith et al. (2001) Nokelainen (2008)
7	Gimeno & Woo (1996). Hypercompetition in a Multimarket Environment: The Role of Strategic Similarity and Multimarket Contact in Competitive De-escalation. <i>OS</i> .	87	20	Multimarket Competition	Smith et al. (2001)	Hoskisson (1999) Stephan (2003)	
8	Miller & Chen (1996). The Simplicity of Competitive Repertoires: an Empirical Analysis. <i>SMJ</i> .	84	15	Competitive Activity			Smith et al. (2001) Nokelainen (2008)
9	Young, Smith & Grimm (1996). "Austrian" and Industrial Organization Perspectives on Firm-level Competitive Activity and Performance. <i>OS</i> .	82	19	Competitive Activity	Nokelainen (2008)	Smith et al. (2001)	Smith et al. (2001)
10	Ferrier, Smith & Grimm (1999). The Role of Competitive Action in Market Share Erosion and Industry Dethronement: a Study of Industry Leaders and Challengers. <i>AMJ</i> .	133	25	Competitive Activity	Nokelainen (2008)		Smith et al. (2001)

AMJ: Academy of Management Journal, *AMR*: Academy of Management Review, *MSC*: Management Science, *OS*: Organization Science, *SMJ*: Strategic Management Journal. (1) WoK: Cited in Web of Knowledge; (2) Cited in our sample.

TABLE 2
Sample Selection Process

#	Selection steps	Criteria	Criteria or process characteristics	Output	Proportion compared to the initial sample
0	Initial sample	Cited at least one the ten seminal articles between 1990 and 2010	10 seminal articles: Karnani & Wernerfelt (1985); Smith et al. (1991); Chen <i>et al.</i> (1992); Miller & Chen (1994); Baum & Korn (1996); Chen (1996); Gimeno & Woo (1996); Miller & Chen (1996); Young <i>et al.</i> (1996); Ferrier <i>et al.</i> (1999)	652 articles	100%
1	Journal selection	Published in top influential and ranking academic journal	List of journals: Academy of Management Journal, Administrative Science Quarterly, Group and Organizational Management, Journal of Business Research, Journal of International Business Studies, Journal of Management, Management Science, Organization Studies, Strategic Management Journal.	337 articles	51,7%
2	Empirical design	Involved empirical research	Reading the abstract or the full text if necessary	274 articles	42%
3	Competition area	Dealt with competition research	Based on a list of keywords : competition, competitive, competitor, first-mover, coepetition, rivalry, rival, strategic group, regional clusters	106 articles	16,3%
4	Theoretical foundation	Been consistent with the theoretical foundations of competitive dynamics research	Coding the dependent or independent variables as competitive actions after having carefully analyzed hypotheses, models or propositions. If at least one of the variables is coded as a competitive action, the article is considered consistent with the focus on competitive dynamics research on competitive action (Hoskisson, 1999; Smith et al., 2001).	76 articles	11,8%

TABLE 3
Coding Grid of the Meta-method Analysis and Findings

Categories	Subcategories	Coding value	Coding characteristics	Example	Freq	%
Article	Date of publication		Comprised between 1991 and 2011			
	Journal		Nine journals			
	Link with seminal articles		Seminal articles cited in the references			
	Link with competitive dynamics research		Number of seminal articles cited in the references			
Competition	Area of research	Individual action	Each individual competitive action is observed		37	49%
		Competitive activity	Competitive behavior is observed taking into account the whole set of actions of a firm in a finite period		19	24%
		Multimarket competition	Firms compete in two or more product categories or markets	Gimeno (1996)	20	26%
	Actions types	Particular	A specific competitive action such as market entry, new product introduction,	Chen (1992)	39	51%
		All	All competitive actions defined as a competitive move initiated by a firm to defend or improve its relative competitive position	Fuentelsaz (2002)	37	49%
	Focus	Rivalry	Research focuses on the interaction between firms	Chen (1992)	27	35%
		Competitive behavior	Research focuses on the antecedents or consequences of competitive behavior	Hambrick (1996)	49	64%
	Sampling	Country	Single	Competitive dynamics is observed within a single country	Smith <i>et al.</i> (1991)	69
Multiple			Competitive dynamics is observed on several foreign markets within the same study	Yu et Canella (2007)	7	9%
US data					57	75%
Industry		Non US data			19	25%
		Single	Competitive dynamics is observed within a single industry such as airlines industry or banking	Miller & Chen (1994)	52	86%
		Multiple	Competitive dynamics is observed on several industries within the same study	Ferrier (1999)	24	14%

TABLE 3
Coding Grid of the Meta-method Analysis and Findings (continued)

Categories	Subcategories	Coding value	Coding characteristics	Example	Freq	%	
Method	Design	Pure qualitative	Tashakkori & Teddlie's typology (1998)	Hopkins (2003)	2		
		Pure quantitative	Tashakkori & Teddlie's typology (1998)	Stephan (2003)	30	39	
		Mixed	Tashakkori & Teddlie (1998) and Greene, Caracelli & Graham (1989) typologies	Connelly (2010)	44	58%	
	Actions data source	Primary data		Chen (2010)	9	12%	
		Secondary data		Anand (2009)	64	84%	
		Primary and secondary		Chen (2007)	3		
	Actions identification	Direct		Kalinis (2006)	34	45%	
		Careful reading		Young (1996)	19	25%	
		Keywords list		Basedeo (2006)	18	24%	
		Not detailed			5		
	Actions qualification	Direct			3		
		Careful reading			20		
		Keywords list			8		
		None or not detailed			44		
Other				2			
Time framing	Design	Longitudinal		Lamberg (2009)	69	91%	
		Cross sectional		Kotha (2001)	7	9%	
	Coverage	Years					
		Window					
		Conceptualization	Explicit	Mitchell & James (2001)	Nadkarni (2007)	9	12%
	Evaluation		Implicit		Kalinis (2006)		
			None		Pegels (2000)	9	12%
			Measures	Mosakowki & Earley (2002)	Srivastava (2005)	13	17%
		Methods	Mitchell & James (2001)	Martin (1998)	23	30%	
	Measures and methods		Mas-Ruiz (2005)	31	41%		

TABLE 4
A Longitudinal view of Competitive Dynamics Areas of Research

Date of publication	Individual action	Competitive activity	Multimarket competition
1992-2005	18	2	11
2006-2011	17	12	7

TABLE 5
Industry sample in single-industry studies

Date of publication	Airline industry	Other industries
1992 - 2002	18	4
2002-2011	4	27

TABLE 6
Research design in the three areas of research

Research design	Individual action	Competitive activity	Multimarket competition
Pure quantitative methods	13	2	15
Mixed methods	23	16	4
Pure qualitative methods	2	0	0