Causation, counterfactuals and competitive advantage

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Final version, January 12, 2009

Abstract

Causation is still poorly understood in strategy research, and confusion prevails around key concepts such as competitive advantage. In this paper, we define epistemological conditions that help to dispel some of this confusion and to provide a basis for more developed approaches. In particular, we argue that a counterfactual approach – that builds on a systematic analysis of 'what-if' questions – can advance our understanding of key causal mechanisms in strategy research. We offer two concrete methodologies – counterfactual history and causal modeling – as useful solutions. We also show that these methodologies open up new avenues in research on competitive advantage. Counterfactual history can add to our understanding of the context-specific construction of resource-based competitive advantage and path dependence, and causal modeling can help to reconceptualize the relationships between resources and performance. In particular, resource properties can be regarded as mediating mechanisms in these causal relationships.

Keywords: causation, counterfactuals, competitive advantage, resource properties, history, causal modeling

Causation is a central, often debated issue in strategy research (Cockburn, Henderson, and Stern, 2000; King and Zeithaml, 2001; Powell, Lovallo and Caringal, 2006). Classically, causation operates under the principle that events have causes and consequences (De Rond and Thietart, 2007; Powell *et al.*, 2006). For some researchers, causation involves empirical inquiry that verifies or falsifies law-like relationships between key variables (Camerer, 1985; Montgomery, Wernerfelt and Balakrishnan, 1989). For others, such causal relationships are more the discourse of researchers and do not necessarily correspond to anything concrete or lasting in the post-modern world (Löwendahl and Revang, 1998). Still others argue that causation should not be reduced to correlation, but should be analyzed at the level of structures and processes (Godfrey and Hill, 1995; Tsang, 2006; Tsang and Kwan, 1999). Finally, there are those who see causation as beliefs that have instrumental value above anything else (Mahoney, 1993; Powell, 2003; Powell *et al.*, 2006).

Our key concern is that current disparate interpretations of causation generate wide-open questions that plague the future development of strategy as a scientific and applied discipline. These questions include the imprecise nature of concepts (Godfrey and Hill, 1995), the ambiguous meanings of measures and the misuse of statistical techniques (Bergh and Holbein, 1997; Boyd, Gove, and Hitt, 2005), and the generalizability of findings (Boyd, Finkelstein, and Gove, 2005). Hence, there is a need for clarification of what causation is and means for strategic management research. In particular, we need methodological solutions to the dilemmas faced by research focusing on competitive advantage.

In this paper, we therefore advocate a counterfactual approach to causation in strategy research. Counterfactuals – questions regarding what would have happened otherwise (Collins, Hall and Paul 2004; Lewis, 1973; Woodward, 2003) – can be seen as key parts of causal analysis, but they have seldom received explicit attention in strategy research. We begin with a review of different epistemological perspectives on causation to clarify the basis of causation. We highlight the problems associated with the positivist and constructionist views, which tend to dominate discussions on causation in the strategy field. We then take up realist and pragmatist perspectives, which provide us with the insights needed to outline four conditions for an epistemological position that dispels some of the confusion around causation and serves as the basis for our counterfactual approach.

On this basis, we proceed by drawing on philosophical studies of counterfactuals (Collins *et al.*, 2004; Lewis, 1973, 1986) and their applications in qualitative (Tetlock and Belkin, 1996, Tetlock, Lebow and Parker, 2006) and quantitative analysis (Morgan and Winship, 2007; Pearl, 2000) to advance our understanding of causation in concrete terms. We propose two methodological solutions for such research: counterfactual history and causal modeling. We show how counterfactual reasoning and methods can in particular advance research on competitive advantage. We argue that counterfactual methods can open up new avenues in historical analysis of constructions of resource-based competitive advantage and path dependence, but maintain that one should also focus attention on the cognitive biases of causal reasoning. Furthermore, we show that applications of causal modeling provide opportunities for new conceptualizations and empirical testing of the relationships between resources and performance. In particular, we suggest that resource properties can be regarded as mediating mechanisms in these causal relationships. Finally, we conclude by emphasizing the role of causation in strategy research, and make a plea for strategy research that will focus on commonalities rather than exacerbate epistemological differences.

AN EPISTEMOLOGICAL BASIS FOR CAUSATION

A proper understanding of the current debates around causation must start with a review of the current dominant perspectives. In this section, we first review the positivist and constructionist perspectives on causation that still tend to dominate discussions on causation in strategy studies, and then take up the realist and pragmatist alternatives. This review provides an epistemological basis for our counterfactual approach. The key characteristics of these perspectives are summarized in Table 1. This table shows fundamental differences in conceptions of causation and the implications for analyses of competitive advantage.

TABLE 1. Perspectives on causation in strategy research

	Causation	Competitive advantage	Research objectives
Positivism	Nomothetic view	An object, the existence of which is validated by studies reporting positive effects on performance	Empirical validation revealing the statistical associations and causal relationships between industrial conditions, resource position, and performance
Constructionism	Rejection of causation	A social and discursive construction with no obvious causal status	Analysis of how social actors make sense and elaborate on competitive advantage as a construct in specific settings
Realism	Focus on generative structures and causal mechanisms	A causal mechanism; cannot usually be observed or studied directly	Analysis of the causal mechanisms creating (impairing) competitive advantage in specific settings
Pragmatism	Instrumental view of causation; focuses on its effects on action	A concept of instrumental value	Analysis of how the notion of competitive advantage and related knowledge can effectively contribute to strategic action

Causation is a central concept in positivism, which emphasizes nomothetic (law-like) regularities between causes and effects (Hume, 1955). Positivist researchers follow a hypothetico-deductive logic: theoretical and falsifiable propositions are formulated and then tested for veracity using appropriate empirical methods. In terms of the conception of causation, positivism is based on the deductive-nomological model (Hempel, 1965). By and large, positivism is the dominant view on causation in strategy research (Bergh and Holbein, 1997; Blaug, 1980; Boyd *et al.*, 2005a; Camerer, 1985; Montgomery *et al.*, 1989; Simon, 1947).

The positivist view on causation, however, has acknowledged limitations. First, because many factors in the theories used in strategy are not directly observable or measurable, the status of these 'unobservables' is a central problem (Godfrey and Hill, 1995). While many positivists believe that such unobservables are necessary for making predictions but need not be included in empirical tests (Friedman, 1953; Godfrey and Hill, 1995), others argue in favor of only observable, positive, factors. However, in some cases, absence seems to have important consequences.[1]

Second, positivist research relies on statistical methods and tests. Nevertheless, observational biases, measurement errors, model misspecification, and the ambiguity of findings compromise the ascertainment of causation (Bergh and Holbein, 1997; Boyd *et al.*, 2005b; Denrell, 2003; Shaver, 1998). For instance, a direct empirical association of resources with superior financial performance does not preclude omission or misspecification of links in the complex causal chain, such as industrial conditions, resource properties, competitive advantage, or superior performance (Cockburn *et al.*, 2000; see also Tsang, 2006 about assumption-omitted testing). There are also empirical and methodological problems related to the direction of causality and the reciprocal effects between, for instance, ability and performance (Boyd *et al.*,

[1] For instance, Trevino and Weaver (2003: 331) argue that positivist perspectives on organizational ethics are limited by the fact that "one of the major challenges of studying business ethics is that success is often evidenced by the 'absence' of unethical or illegal conduct; but empirical researchers generally wish to account for increases in some phenomenon. It is difficult to explain variance in something that is absent."

2005a; Denrell, 2003). In this spirit, March and Sutton (1997) argue that financial performance may be both a consequence of various behaviors and an explanation for them.

Third, positivism is also confronted with the question of the ‘double hermeneutic;’ that is the phenomena under study have already been conceptualized (Giddens, 1984; Numagami, 1998). In strategy studies, we are dealing not only with natural reality, but also with values, beliefs, and interpretations regarding, for instance, what constitutes competitive advantage, which are then reflected in observable behavior. In fact, competitive advantage was not discussed before this discourse gained popularity in the 1960s, along with the emergence of strategy studies. This is obviously also true of other disciplines: MacKenzie and Millo (2003) in sociology, and Ferraro, Pfeffer, and Sutton (2005) in economics warn us against this risk of self-fulfilling theories. Such concerns of constructed causality lie at the heart of the constructionist perspective, which we explore next.

Constructionist thinking has been embraced by philosophers and scientists in various disciplines (Berger and Luckmann, 1966; Gergen, 1999; Knorr-Cetina, 1983; Latour and Woolgar, 1989), including management and strategy research (Johnson and Duberley, 2003; Weick, 1989). While there are different versions of constructionism (e.g., ’constructivism’), most constructionists share some central assumptions. One such assumption is that our knowledge of the world – and thus of organizations and strategies – is produced or invented in social processes where linguistic elements in particular play a key role (Gergen, 1999). At the heart of this view is a widespread philosophical position that emphasizes the distinctive interpretative nature of social phenomena and science. For example, Winch (1958) has argued that the natural sciences deal only with *external relations* and the social sciences with *internal relations*. According to this view, causation (which, following Hume (1955), deals with external relations) has no relevance in social sciences. For von Wright (1971), the natural sciences deal with explanations – and thus causation – whereas social sciences focus on understanding and interpretations. Such views have also been reproduced in epistemological discussions in strategy research that point to the futility of trying to establish causal relationships that are context-dependent and complicated by the ongoing constructions of the social actors. For example, Löwendahl and Revang (1998: 769) argue that “Ongoing global changes have produced such complexity and uncertainty that knowledge of causal relations is not possible.”

The constructionist position is, however, problematic. In general, constructionism involves the risk of ontological relativism, that is of an inability to distinguish between more or less true theories or propositions. At the extreme, this can mean that a completely imaginary theory is accepted as true as long as it is coherent and accepted by the scientific community.[2] Furthermore, it is difficult to analyze any phenomena without notions such as cause or causal explanation. Constructionists themselves use causal language despite an explicit rejection of causal research, as illustrated by Löwendahl and Revang (above), where ”produce” implies causation. Thus, some notion of causation is also needed for constructionist analyses. This has led others, such as the scientific realists, to search for new epistemological formulations.

Discussions about realism, which began in the 1970s, can be seen as an attempt to develop an alternative to positivism and constructionism especially in the case of causation (Bhaskar, 1975, 1979; Bunge, 2001; Harré, 1970; Harré and Madden, 1975; Hull, 1988). This perspective has also received increasing interest in management research in general (Ackroyd and Fleetwood, 2000, 2004; Bacharach, 1989; Tsoukas, 1989; Van de Ven, 2007) and strategy research in particular (Godfrey and Hill, 1995; Kwan and Tsang, 2001; Tsang, 2006; Tsang and

[2] As Huber and Mirosky (1997) put it, “Does every version of an event have as much validity as every other version? This last question is crucial because if the answer is yes, then scientific confirmation or replication is pointless […] The belief that social research is only one of many possible narratives takes sociologists altogether out of the business of trying to gather valid data. What would be the point?” (1997: 1426 and 1428).

Kwan, 1999). According to the realist view, a constant conjunction of events is neither a sufficient nor a necessary condition for the manifestation of causality. Instead, realists focus on generative mechanisms or causal powers and their effects. To ascribe causal power to an object is to describe something that it will or can do in appropriate conditions by virtue of its intrinsic nature (Harré and Madden, 1975). In social life, however, objects are often part of social structures. Thus, generative mechanisms reside in structures that endow them with specific causal powers (Fleetwood, 2004). According to such a transcendental view, these mechanisms generate the structure of causal associations between factors. They exist and have causal potential even when they are not actualized because the effects of the many other causal processes and mechanisms at play may overshadow the particular effects of the causal mechanism under scrutiny (Bhaskar, 1975; Kakkuri-Knuuttila and Vaara, 2007).

Although some realists incorporate ideas about the socially constructed nature of observable events (Kwan and Tsang, 2001; Mir and Watson, 2000; Tsang, 2006), the capacity of the clear-cut realist position to embrace constructionist ideas is limited (Ackroyd and Fleetwood, 2004). In particular, it would be unacceptable for a realist to concur with radical constructionists and negate the causal power of generative mechanisms, demoting them to discourse or fiction with no material implications. Moreover, for scientific realists, the deepest level of understanding requires both theoretical analysis and empirical studies focusing on underlying structures and mechanisms.

However, the realist position also has its limitations. First, researchers cannot directly observe the underlying structures, processes, and mechanisms at play. Events could result from a combination of causes, some effective and others impaired by countervailing mechanisms. Disentangling effective causal powers from ineffective mechanisms in observable and actual phenomena requires demanding analytical and methodological capabilities. Radical and critical realists are thus suspect of inoperative transcendentalism (Morgan and Winship, 2007: 235-237). Second, the realist epistemology does not seem to provide the means to reflect upon the role of researchers vis-à-vis what and how they investigate their research object and intervene in it.

This is why we need to consider insights provided by pragmatists scholars interested in causation. While there are different versions of pragmatism (Dewey, 1988; James, 1975; Peirce, 1992; Rorty, 1989), we draw here on the central ideas initially promoted by Peirce (1992) regarding the instrumental value of causation. In pragmatism, people's conceptions and their sensations, expectations, and beliefs about the value of both knowledge and the inquiry process have a central role (Evered and Louis, 1981; Kaplan, 1964; Mahoney, 1993; Mahoney and Sanchez, 2004; Powell, 2001, 2002; Wicks and Freeman, 1998). Consequently, causation cannot be simply distinguished from an interpretation of a succession of events, as the meaning people give to events in their descriptions and narratives dictates comprehension. Hence, descriptive and normative accounts and facts cannot be as easily separated as positivists or realists would argue. Whereas some causal forces impinge on our freedom to act, they do not encroach upon the meanings facts have for us or for different communities of people (scientists or practitioners). Hence, the unmediated causality and truth envisioned by positivism is unreachable.

For pragmatists like Peirce (1992), causation provides a satisfactory explanation for specific problems because a causal representation helps human agents make successful inferences. To this end, followers of Peirce's pragmatism have developed a stepwise method of inquiry that relies on problem identification and 'abduction' (Peirce, 1992). Abduction combines the elaboration of specific propositions with empirical observations. If these propositions help to explain observations, our knowledge increases. Abduction allows for constant movement between theory and empirical information, for example in analyses of key causal processes and associations. This knowledge, however, is not objective in the traditional sense, but is context-specific and dependent on the perspective of the researcher. Thus, new observations and new propositions can lead to different views that change existing knowledge.

However, critics of pragmatism denounce its instrumental use of causation and its acquiescence to relativism vis-à-vis different versions of reality. In this view, a weakness of pragmatism would be its inability to weigh the utility of different ideas, concepts, and propositions against each other. Hence, the accumulation, transferability, and reproducibility of knowledge would appear secondary in this approach, which might hinder construction of a generalizable corpus of theories and knowledge.

We do neither pretend in this paper to resolve decades of arguments and disputes in and around complex epistemological notions such as causation, nor do we propose a panacea for these lingering issues. However, drawing on the discussion above, we define a basis for developing a counterfactual approach to causation. In particular, we enounce four conditions that constitute a common ground on which to develop our understanding of causation in strategy research:

1. Causation must be distinguished from mere constant conjunction or statistical association; by going beyond the regularity view on causation, one can avoid some of the pitfalls of positivist tenets and deal with the constructionist critique that targets the regularity view of causation;
2. Causation results from a complex activation of mechanisms and countervailing forces. As argued by realists, there are three levels of causation: generative mechanisms, actualization, and observable phenomena.
3. However, the standard transcendental view of the realists must be expanded to acknowledge the importance of the interventions and constructions of social actors. Actors can trigger or hinder the actualization of causal mechanisms,

leading to expected (or unexpected) outcomes. They cannot change the causal mechanisms *per se,* but influence conditions that favor their occurrence. Actors' interpretations also affect their actions and consequently the social and strategic phenomena in question.

4. Causal explanations have instrumental value, which depends on their explanatory power, e.g., whether these interpretations lead to increasingly better understanding of the phenomena in question.

This epistemological position also serves as the basis for our counterfactual approach that focuses on a crucial but often neglected aspect of causation: evaluation of whether a specific factor actually causes a particular outcome by the construction of counterfactual 'what-if' scenarios. Counterfactual reasoning, as we explain below, conforms to the conditions just mentioned. It does not confound statistical association with causation, stresses degrees in causal relationships ranging from what is observable (the lowest degree) to immutable mechanisms of event sequencing (the highest degree), acknowledges human intervention in activating/deactivating causal paths; and is eventually amenable to the interpretations of actors. Hence, we now proceed to outline a counterfactual perspective on causation that provides a concrete means for advancing rigorous causal research in strategy.

A COUNTERFACTUAL APPROACH TO CAUSATION

Counterfactuals are conditional statements that probe the direction and stability of a relationship between an event and its consequence (Collins *et al.,* 2004; Lewis, 1973; Woodward, 2003). They attest to whether a change in a factor or event is causally associated with changes in another. In other words, counterfactuals test different case scenarios and play a central, although somewhat varied, role in both qualitative and quantitative analyses of causation by testing whether a specific factor is necessary to produce a particular effect (Woodward, 2003). While there are different theories of counterfactuals, Lewis's (1973, 1986, 2000) counterfactual theory of causation is probably the most widely discussed in the philosophy of science. We start with this view, but also include insights of others on 'possible worlds,' most notably those of political scientists and historians (Tetlock and Belkin, 1996, Tetlock *et al.*, 2006), and work on causal modeling and inference (Morgan and Winship, 2007; Pearl, 2000).

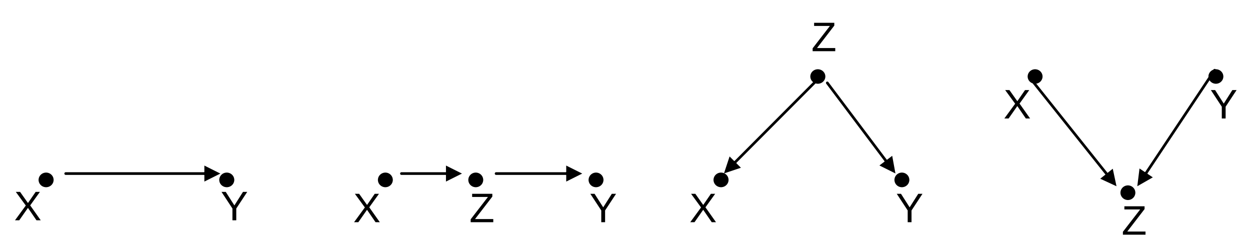
The core idea in Lewis's counterfactual analysis is the existence of 'possible worlds.' We can imagine alternative realities that bear varying degrees of similarity to the actual one. Following Lewis's logical demonstrations, depending on the conditional operators 'might' and 'would,' one can explore imagined consequences of actions and of the presence or absence of antecedents in more or less similar worlds. Some logical principles such as necessity, conditional strictness, and the similarity of possible worlds determine the status of the counterfactuals. For instance, it is logically impossible for two possible worlds to disagree with respect to a particular causal fact while agreeing completely with respect to all non-causal facts. In general, a counterfactual statement is true if "the material conditional of its antecedent and consequent is true throughout S_i – S_i is the set of all worlds that are similar to at least a certain fixed degree to the world I" (Lewis, 1973: 9). An event Y depends causally on a distinct event X if and only if both X and Y occur, and if X had not occurred, then Y would not have occurred either. Lewis put it as follows: "We think of a cause as something that makes a difference, and the difference it makes must be a difference from what would have happened without it. Had it been absent, its effects — some of them, at least, and usually all — would have been absent as well." (1986: 161). In addition, X is a cause of Y if the counterfactual conditionals applied to X and Y are of proper type, that is do neither regress ad infinitum nor imply further non-independent conditions.

Comparing propositions in quasi-similar worlds thus enables one to separate causal facts from non-causal ones and to reveal to which degree Y is dependent on X.

While Lewis' initial views attribute to possible worlds a strong ontological status, most philosophers would think of these alternative realities as convenient means of contrasting an actual course of events with other possibilities. When it takes less of a departure from actuality to make the antecedent X true along with the consequent Y than to make the antecedent X true without the consequent Y, the counterfactual "if X were the case, Y would be the case" is true. Hence, too great a departure from the actual world obscures the comparison of causal relationships. In the formulation and actual analysis of counterfactuals, the constructed possible worlds must provide a plausible alternative to the actual world. This principle allows researchers to link counterfactuals to factors that "matter," not to just any kind of possible causal relation.

Historians (Ferguson, 1997; Fogel, 1964) and political scientists (Tetlock and Belkin, 1996, Tetlock *et al.*, 2006) have used counterfactual reasoning to examine events and phenomena of historical significance and compared them with alternative, imaginary realities. Tetlock and Belkin (1996) explain the basis for counterfactual research in social studies as follows: "Counterfactual reasoning is a prerequisite for any form of learning from history. To paraphrase Robert Fogel's (1964) reply to the critics of "counterfactualizing" in the 1960s, everyone does it and the alternative to an open counterfactual model is a concealed one" (Tetlock and Belkin, 1996: 4). Ferguson (1997) argues that cautiously elaborated counterfactuals play an important role in overcoming determinism, inevitability, and heroism in traditional historical research. He stresses the central issue of selecting which counterfactuals to focus on: "In short, by narrowing down the historical alternatives we consider those which are *plausible* – and hence by replacing the enigma of 'chance' with the calculation of *probabilities* – we solve the dilemma of choosing between a single deterministic past and an unmanageable infinite number of possible pasts. The counterfactual scenarios we therefore need to construct are not mere fantasy: they are simulations based on calculations about the relative probability of plausible outcomes in a chaotic world (hence 'virtual history')" (Ferguson, 1997: 85). We will use their ideas in the next section to spell out how counterfactual history can be applied in strategy studies.

Important and relevant work on the statistical implications of counterfactual reasoning has in turn focused on causal modeling (Morgan and Winship, 2007; Pearl, 2000). For two decades philosophers and computer scientists from Carnegie Mellon University (Spirtes, Glymour and Scheines, 2000) and elsewhere (Morgan and Winship, 2007; Pearl, 2000; Salmon, 1998) have worked on mathematical causal models that build on counterfactual logic. These scholars have created an extensive corpus centered on the study of causal models, namely, graphs that relate factors on which logical, mathematical, and probabilistic properties can be assessed. In a graph, arrows indicate the causal order (see Figure 1). For instance, X → Y means that X causes Y. In the mediation chain X → Z → Y, X and Y are unconditionally associated, namely having knowledge on X will give some information on the likely value of Y. In mutual dependence, X ← Z → Y, X and Y are also unconditionally associated, but this time because they mutually depend on Z. In mutual causation, X → Z ← Y, X and Y are not unconditionally associated. Having knowledge on X does not provide information on how Y looks. Z is said to block the possible causal effects of A and B on each other.



Simple path | Mediation | Mutual dependence | Mutual causation

Figure 1. Basic relationships

In this tradition, the determination of a causal influence relies on how a counterfactual situation contrasts with an actual situation, that is the comparison of two individual situations, one of which is observable and the other not. Suppose that each individual in a population is exposed to two alternative states of a cause. If the outcome is corporate performance, the population of interest could be firms belonging to a given industrial sector, and the two states whether or not a firm possesses a strategic resource. The 'treatment state' is to possess such a resource; the 'control state' is not to have it. Distinct sets of conditions characterize each alternative state that impacts the outcome of interest. For instance, the possession of strategic resources depends on distinct surrounding conditions, and each state influences corporate performance in different ways. Counterfactual logic compares potential outcomes for each individual (namely a firm in our example) in each treatment state. Indeed, only one observation for each individual is possible at any point in time. Hence, one needs to construct counterfactual 'what-if' outcomes. For example, firms possessing strategic resources have a 'what-if' performance when they possess only generic resources, whereas firms with generic resources have a 'what-if' performance when they possess a strategic resource. Therefore, for each individual, distinct outcomes result from relative exposure to the alternative treatment. Let us suppose that y^1_i and y^0_i correspond to the potential outcomes for individual i in the treatment state (superscript 1) and in the control state (superscript 0). The theoretical difference or contrast between these two values enables one to approach the distinctive influence of the treatment (namely possessing a strategic resource) on the outcome. However, y^0_i is unobservable for individuals belonging to the treatment group, whereas y^1_i is unobservable for individuals belonging to the control group. Hence, since these two values cannot be observed at the individual level, one needs to contrast cause and effects at the population level in order to complete a full graph of relationships between the cause X (possessing a strategic resource), the outcome Y (corporate performance), the surrounding conditions Z, their relationships with the observed X and Y, and potential unobservable variables that complicate the causal explanation of Y by X. As we will explain below, the combination of causal graphs and counterfactual testing and evaluation provide very useful tests of causal relationships that are more powerful than classical statistic methods.

TWO METHODOLOGIES FOR COUNTERFACTUAL CAUSAL ANALYSIS

How then can such counterfactual research be conducted in practice? In the following, we present two methodologies that can be used in counterfactual causal strategy research: counterfactual history and causal modeling. While there are other methods that can be used in counterfactual analysis, these two provide useful examples of qualitative and quantitative analyses that have been successfully used elsewhere but seldom applied to strategy research.

Counterfactual history

Strategy research has been criticized for a lack of historical perspective; that is for making poor use of longitudinal comparative analyses (Booth, 2003; Kieser, 1994). This is also the case with research on competitive advantage. The reasons for the lack of historical analysis include the ambiguity concerning the nature of causation in historical studies and the problems encountered in dealing with alternative histories and retrospective biases. We see counterfactual historical case study research as a methodology that can help in resolving these challenges.

The kinds of tests conducted in the natural sciences are not possible in social research in general and strategy research in particular. Thus, there is a need to use specific methods such as the construction of counterfactuals to be able to examine what could have happened had the initial event not taken place. As noted above, historians and political scientists (Ferguson, 1997; Fogel, 1964; Griffin, 1993; Tetlock and Belkin, 1996) have developed the use of counterfactual reasoning in qualitative case studies. This method builds on the idea of imagining the suppression of the occurrence of an event to test the significance of causal mechanisms and paths. This testing involves the construction of alternative scenarios and worlds, in other words what could have happened had X not occurred (Tetlock and Belkin, 1996; Tetlock *et al.*, 2006). In fact, counterfactuals are like thought experiments (De Mey and Weber, 2003; Lewis, 1973) or fiction (Tetlock *et al.*, 2006; White, 1987) in the sense that they require the construction of 'possible worlds.' Examples of such analyses range from reinterpretations of the industrial revolution and its causes and consequences (Fogel, 1964) to reconstructions of World War II (Ferguson, 1997) or our Western civilization (Tetlock *et al*., 2006).

There is no reason why strategy scholars could not follow these examples and use counterfactual history to advance understanding of causation in strategy research. In particular, research on competitive advantage prompts questions about what would happen if specific resources or capabilities did not exist, if others existed, or whether the competitive advantage under scrutiny is needed to produce an outcome (e.g., superior financial performance). Even though qualitative counterfactual analyses have been relatively rare in studies of competitive advantage, they can elucidate precisely such crucial questions.

While such qualitative research does not usually proceed in clear-cut stages, we propose three generic steps to be followed when applying this approach to strategy research:

1. <u>Identify critical events</u>. Historical case study research builds on event-causality; that is on an analysis of how specific events may be causally linked. A careful mapping of events and a thorough analysis of how these events relate to broader and more general facts is the first step in such analysis. Typically, this mapping involves choices as to which factors to

emphasize and which to leave outside the core model. Such challenges characterize all process-oriented qualitative strategy research where one works with, compares, and distills data coming from various sources (Huber and van den Ven, 1995; Langley, 1999), but are accentuated in causal analysis due to the need to assess the impact of specific processes, mechanisms, and factors on others. Griffin and Ragin (1994) provide a systematic narrative method that combines a thick description of interpretative research and generalizable causal explanations. In particular, Griffin (1993) has proposed an 'event-structure analysis' methodology that links historical narratives to broader structures, leading to a comprehensive understanding of the case in question within a broader framework. In its simplest form, such analysis involves outlining an event time line that links case events to more general phenomena and structures. This event-structure analysis can be conducted by means of software such as Heise's ETHNO program (http://www.indiana.edu/~socpsy/ESA/home.html) (Heise, 1989). This program helps to pose 'yes'/'no' questions regarding the impact of antecedent events or actions on subsequent ones, and has been used by sociologists and organization scholars (for examples, see Griffin, 1993; Stevenson and Greenberg, 1998, 2000; Pajunen, 2004). Such event models provide the basis for the next step.

2. Specify causal processes and mechanisms. The next step is to specify causal explanations on the basis of the event models. The key challenge is to focus attention on particular theory-based causal processes and mechanisms in the case in question. The theoretical ideas about processes and mechanisms can be derived from existing research (in a more deductive research design) or emerge out of theory development alongside the case analysis (in a more inductive research design). This specification involves 'isolation' where attention is focused on only the key causal processes and mechanisms and not

others (Mäki, 1990). As there are numerous important interconnected factors, such isolation is not a trivial step in qualitative causal analysis, but one that usually involves difficult choices as to what to include and exclude. In any case, the objective is to spell out theoretically and empirically grounded arguments concerning fundamental causal processes and mechanisms. They can usually be expressed in terms of hypotheses or propositions that then need to be tested with counterfactual analysis.

3. <u>Use counterfactuals to establish causation</u>. Based on the identified potential causal structures, processes and mechanisms, the third stage involves contrasting the hypothesized causal explanations with alternative explanations. As explained previously, 'possible world' counterfactuals ("what could have happened had X not occurred") play a central role in contrasting hypothesized causal explanations with alternative ones. In particular, they serve as contrastive explanations that are used to validate the causal claims (Maslen, 2004). Crucially, these counterfactuals should never be pure imagination, since their premises need to be supported with theoretical arguments and empirical data that are logically consistent with the causal hypotheses and propositions developed in step 2 above. Even though the use of counterfactuals can vary greatly depending on the topic at hand, the following principles provide useful guidelines for constructing contrastive counterfactual explanations (see also Tetlock and Belkin, 1996):
    a. Conceptual clarity: The antecedent and consequent variables must be specified so that they are conceptually distinctive and consistent with the initial model (the hypotheses and propositions that are created in step 2 (see above)). For instance, historical analysis can focus on the impact of a strategic decision – e.g., an investment or acquisition – on competitive advantage and financial performance. In that case, the counterfactual scenario must be based on the absence of such

decision or on an alternative decision, keeping other key variables as similar as possible to the initial model. Similarly, historical analysis can examine whether particular resources were the source of superior performance in a given time period. In the counterfactual scenario, the starting point is then the absence of such resources, with other key variables remaining the same.

b. Cotenability: Cotenability requires that the antecedent must logically imply its consequent and that there must be compatibility between all known facts. For instance, in a study of the impact of a strategic decision on performance, the implications of the absence of such a decision or an alternative decision must be logical given all the other information around that case.

c. Historical consistency (‘minimal rewrite rule’): The specifications of antecedents must alter as few established historical facts as possible. Ideally, the possible ‘imagined worlds’ should start with the ‘real world’ as it is known before the counterfactual was developed, not require rewriting long stretches of history, and not deviate too much from what we already know about the key actors and circumstances. For example, in an analysis of the impact of a strategic decision on competitive advantage, the alternative counterfactual scenarios must not alter other conditions, only the key decision in question, implying for instance that no decision was made (if this is plausible) or that other conceivable decisions were carried out.

d. Theoretical consistency: The connecting principles between the antecedent and consequent should be consistent with the relevant theories. These theories can be established ones or new ideas offering the basis for the contrastive explanations. The point is that the more clearly the counterfactual scenarios are linked with alternative but conceivable theoretical explanations, the better the result validates the proposed causal theorems. In some cases, the counterfactuals can serve as means to spell out different and competing theorizations, but obviously not all counterfactual analysis needs to be theory-testing in nature (Tetlock *et al.,* 2006).

e. Generalizations and projectability: Connecting principles should be consistent with well-established generalizations relevant to the antecedent-consequent link. In principle, the linkages between antecedent and consequent should not be overly complex, but build on reasonable inferences about the likely and possible effects of specific factors. For example, available historical information on industry growth, performance, and profit margins can provide the basis for qualitative or quantitative estimates in counterfactual scenarios. Thus, in an analysis of the impact of a specific decision on competitive advantage, the outcomes of the counterfactual scenarios (no decision or alternative decisions), can be estimated by using precisely such information. Projectability is an overall principle that should be followed in counterfactual analysis: one should be able to distinguish between coincidental generalizations that just happen to be true at a particular time and place (and are thus unprojectable) and robust general mechanisms that are valid in a range of circumstances and permit projections into the past and future (Goodman, 1983).

These counterfactuals are then used to validate or falsify hypothesized causal relationships, for example those regarding the existence of competitive advantage in a given setting. It should be emphasized that this kind of qualitative historical analysis often follows an abductive logic that combines deductive and inductive reasoning: reformulations of the initial models (step 2) and contrastive counterfactual explanations (step 3) are needed until the final causal model provides a credible account of the historical processes and mechanisms in question.

Applications. Counterfactual historical analysis can be applied to a variety of questions in strategy research. Historical analyses can enlighten us regarding the causes and consequences of competitive advantage in ways that emphasize contextual issues and cultural dependencies (Kieser, 1994). This opens up new avenues for studying issues such as the historical construction of resource-based competitive advantage (Bogner, Thomas and McGee, 1996; Priem and Butler, 2001) and path dependence (Booth, 2003; Lamberg and Tikkanen, 2006). In particular, counterfactual history can be seen as a means to avoid oversimplifications and excessive determinism in our interpretations of the role of specific strategic decisions and key decision-makers (for analogous arguments in political history, see Ferguson, 1997; Tetlock and Belkin, 1996).

Counterfactual history also involves specific challenges. To some opponents of historical counterfactual analysis, the imagination exercise about possible worlds looks hopelessly subjective and circular, while to others it appears arbitrary, purely speculative, and self-serving. Another objection deals with the idea that variables in which one cannot intervene cannot be scientifically analyzed. Hence, counterfactuals will border on fanciful conjectures. Furthermore, some reject the postulate according to which 'what-if' scenarios can contribute scientific value since they are inherently non-testable. We do not respond to each criticism, but concur with Tetlock and Belkin: "We do not conclude that things are hopeless – that it is impossible to draw causal lessons from history. Rather, we conclude that disciplined use of counterfactuals – grounded in explicit standards of evidence and proof – can be enlightening in specific historical, theoretical, and empirical settings" (Tetlock and Belkin, 1996: 38). Furthermore, it should be emphasized that strategy scholars usually deal with chains of events, the consequences of which do not affect entire civilizations and are less remote in time than in most historical research. Thus, these concerns should be more limited in strategy studies than in some other areas of social or historical research.

However, such analysis must take into account the cognitive biases that characterize both managers' retrospective accounts and researchers' explanations. It is crucial to pay attention to these biases, especially in the case of competitive advantage since ambiguity is a fundamental component of sustainable advantage (King and Zeithaml, 2001) and self-serving attributions are an inherent part of causal claims in an organizational context (Powell *et al.*, 2006). For instance, managers' decisions usually lead them to overemphasize their own actions in successful ventures and to downplay their role in failures (Salancik and Meindl, 1984; Vaara, 2002). Past research has also shown that the illusion of control at the organizational level leads to optimistic biases in estimating future trends and can cause resource misallocations (Durand, 2003; Powell *et al.*, 2006).

In building counterfactual explanations, the minimum requirement is to critically analyze data sources to determine the extent to which such cognitive tendencies characterize people's accounts. In particular, Tetlock and Belkin (1996) challenge researchers to focus attention on 1) what is omitted in models that usually focus on dramatic change at the expense of normality, 2) on whether the choice of counterfactuals often tends to favor overly simplistic and convenient counterfactuals, 3) on whether predictability and controllability are overemphasized at the expense of other explanations, 4) on whether needs to avoid blame and to claim credit distort counterfactual analysis, and 5) on whether needs for consolation and inspiration bias explanations.

Such cognitive biases can also be seen as a special object of study for causal strategy research. In particular, tendencies such as self-serving bias, illusion of control, blame attachment, and scapegoating have been studied in various applications of attribution theory (Bettman and Weitz, 1983; Heider, 1958; Salancik and Meindl, 1984; Weiner, 1986). A rare theoretical example in strategy research is provided by Powell *et al.* (2006), who show how managers' perceptions are a key part of 'real' causal ambiguity; in particular, how the above-average effect increases causal ambiguity, which then decreases the ability to leverage competence, increases barriers to imitation, and augments rival substitution. There are many other ways in which causal beliefs relate to causal explanations (McKenzie and Millo, 2003), and we think that researchers in strategic management have only started to make these connections explicit.

Causal modeling

Causal modeling includes a set of different methods that deal with causal graphs and counterfactual testing. As mentioned earlier, the combination of causal graphs and counterfactual testing and evaluation provides powerful tests of causal relationships. This approach to causation overcomes many of the criticisms that were addressed in the social sciences in the reign of regressions during the 1990s: ignorance of temporality and context, superposition of covariates, and oversimplification of causal linkages in a quest to establish the next interaction effect (Abbott, 2001; Hedström, 2005; Ragin, 2000). Causal modeling is obviously not the only approach that has been developed to deal with such problems. For instance, taking a Bayeasian perspective has been found useful in various fields of social science, including strategy research (Hahn and Doh, 2006; Hansen, Perry and Reese, 2004; Powell, 2001). However, for space limitations, we focus here on causal modeling as a particularly fruitful method of counterfactual analysis.

This approach distinguishes statistical associations from causal relationships. As Pearl states: "I now take causal relationships to be the fundamental building blocks both of physical reality and of human understanding of that reality, and I regard probabilistic relationships as but the surface phenomena of the causal machinery that underlies and propels our understanding of the world" (Pearl, 2000, xiv). In a nutshell, causal relationships are more directional, more stable, and less dependent on intervention than statistical associations (Pearl, 2000; Spirtes, Glymour, and Scheines, 2000; Salmon, 1998). A first key difference between a causal model and a probabilistic association concerns the direction of the relationships. Reversing the direction of the relationship between, for instance, $x1$ and $x2$ does not alter the structure of the relationship from a probabilistic point of view. If integrated with other factors x_i, reversing the direction between $x1$ and $x2$ yields an observationally equivalent network of probabilistic dependencies among factors. However, reading the associations in the opposite direction may be neither theoretically meaningful nor causally accurate. For example, time, logical conditions, or theoretical considerations determine whether such reversibility is feasible. Hence, we need more than probabilistic information to determine the direction of the link $x1 \rightarrow x2$ (Pearl, 2000: 19).

Second, causal relationships are more stable and depend less than statistical associations on additional knowledge about other factors. For example, addition of a variable in an incomplete statistical model can change the value and significance of prior estimated coefficients. In contrast, addition of a factor in a causal model does not dissipate a pre-existing causal association. To give another illustration, when regressors X are statistically dependent, the effect of a regressor Xj linked with other regressors, but not with the outcome variable Y, may bias estimates of regressors X. In fact, even a variable Xj with no influence whatsoever on Y may be given significant regression coefficients (Spirtes *et al.*, 2000: 191). Causal modeling techniques take explicit account of both these spurious effects and the conditioning of relationships on additional antecedents.

Third, causal relationships are not altered by interventions in the models. Causal relationships possess an ontological robustness to changes around the causal variables – for instance resources and capabilities in our case – that probabilistic relationships lack. The intuition behind the notion of intervention as exposed by Pearl (2000) or Spirtes *et al.* (2000, chapter 7) captures differences among states and causal relationships involving antecedents. In our example, we can assume that an intervention would introduce or suppress the strategic properties of a firm's resources (in other words, turning this factor on or off). Although not observable in statistical terms, the causal power of the relationship existing before the intervention remains operative in determining the state of the firm even when it is no longer in effect (turned off). Different techniques are available to capture the counterfactual value of these 'what-if' situations, and to estimate the magnitude of effects in situations with or without an active antecedent.

Simply stated, causal model analysis proceeds in three steps: prediction, counterfactual reasoning, and estimation. These steps form an ascending "natural hierarchy of causal reasoning tasks" (Pearl, 2000: 38). We use a classical RBV example to illustrate in simple terms the implications of these three steps.

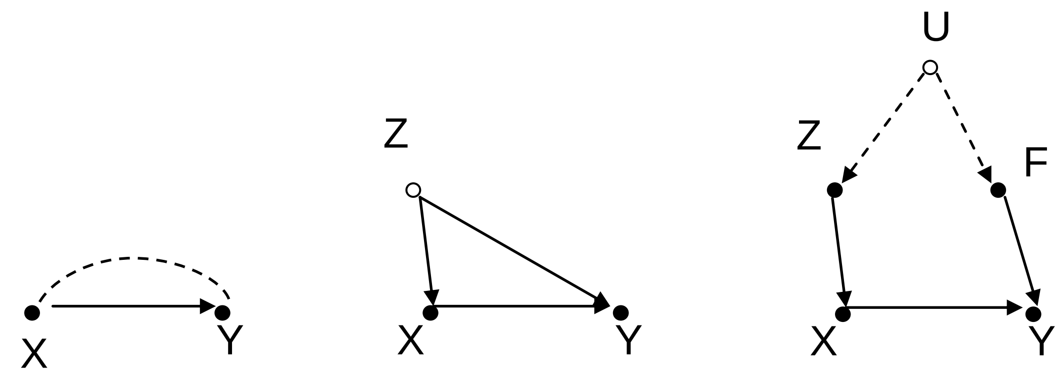
1. <u>Develop predictions</u>. This first step can be conducted by using the covariance matrix and appropriate statistical methods. This is the normal starting point in strategy studies that focus on statistical associations between factors. In RBV terms, a typical question would be the following: Would performance be abnormal if the firm did not possess strategic resources and capabilities? The structural properties of causal relationships as defined by causal models (directionality, stability, dependence, and boundary conditions) are not at

stake in this type of enquiry for which simple probabilistic approaches are well suited (Pearl, 2000: 31).

2. Counterfactual reasoning. In their simplest form, counterfactual statements rephrase predictions, since they convey the logical implications of the classical predictions formulated in the first step. Hence, counterfactual statements are of particular relevance when there is uncertainty or disagreement about the nature and structure of causal chains. They are more than a roundabout way of stating sets of predictions since they focus on the causal mechanisms at work as well as on the prevailing boundary conditions. This second step thus focuses on counterfactual 'what-if' questions. We provide here examples of two different types of counterfactual reformulation. Our illustrative question can now be posed as follows: Would performance be abnormal had the firm not possessed strategic resources and capabilities, given that firm performance is in fact average and the firm possesses strategic resources and capabilities? Another way of counterfactually reformulating the question assumes intervention: Would performance be abnormal if we intervened to make sure that the firm does not possess strategic resources and capabilities? Intervention is a common mental counterfactual operation that consists of hypothesizing changes in the states of a Y variable when there are changing values in variable X, an antecedent of Y. Since a causal relationship is stable and invariant, the evaluation of intervention is simpler than resorting to conditional probabilities that may be modified in unknown proportions by the context of intervention. Intervention acts on a function of the model instead of on an entire set of conditional probabilities. The effect of the intervention can be predicted by modifying the corresponding equations representing the causal model and computing new probability functions. In some instances – e.g., experimentation – these operations can be effective and observable.

It should also be noted that based on the structure of data, the presence of unobserved effects can be examined by such counterfactual analysis. Pearl (2000) suggests using computational techniques and algorithms (e.g., the TETRAD program: http://www.phil.cmu.edu/projects/tetrad/) to exhaust the set of possible relationships, including effects due to latent or unobservable factors, to determine the more parsimonious causal models capturing the causal associations within a series of data. Through a systematic exploration of the set of relations between a series of observations, it is possible to establish the presence of an unobservable factor. The new causal model that includes the unobserved factor can mimic the series of observed associations better than the original causal model. Based on the Occam's razor principle, causal modeling assumes that the minimal model is superior to any others (the parsimony principle). Whereas statistical procedures necessitate the inclusion of as many control variables as possible to limit the impact of unobservable factors, causal model techniques can infer the causal influence of unobservables, while relying on the researchers' knowledge to specify them. Hence, these techniques help to determine the boundary conditions of a causal model.

3. <u>Causal effect estimation.</u> Figure 2a depicts a causal graph where single-headed arrows represent a causal relationship between the variable at the origin and the variable at the arrow's head. Dashed double-arrows indicate the presence of common unobserved causes of both terminal variables. This graph is not a full causal model because some unobservable causal antecedents affect X and Y, and can subsequently explain variations in Y via longer paths than direct and observable X → Y. It should be noted that causal graphs are non-parametric and acyclic (i.e., they do not permit representation of circular causation whereby Y would impact X).



2a: Joint dependence

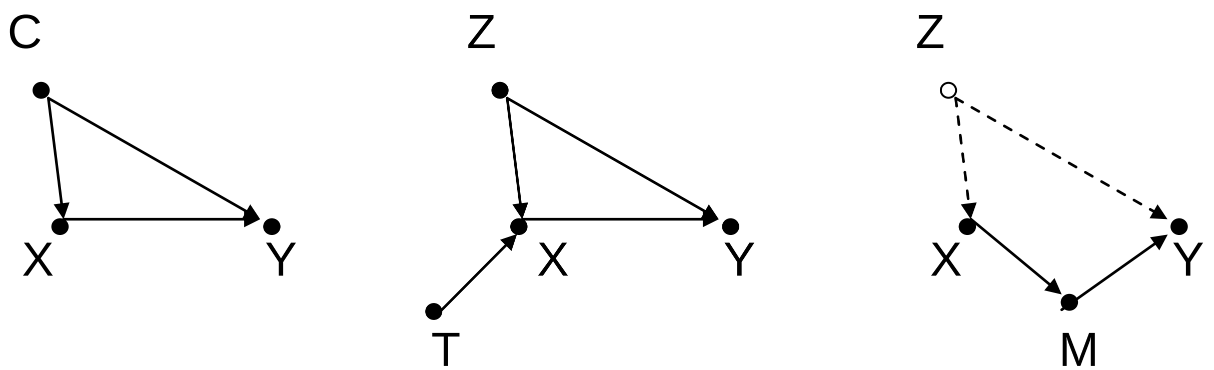
2b: joint dependence of X and Y on unobservable variable Z

2c: back-door path (blocked by conditioning on F)

Figure 2. Representation of a simple back-door path

The general principle of causal graph estimation is to eliminate ‘back-door paths,’ namely paths that can be viewed as entering X through the back door (Pearl, 2000: 79). To use graphical language, any arrow’s head pointing to X can be regarded as entering through the back door. Figure 2b illustrates a situation where X and Y are mutually dependent on an unobservable Z variable; the dot for Z is white, indicating unobservability. To satisfy the back-door criterion, Pearl shows that (i) no node in Z is a descendant of X, and (ii) Z blocks every path between X and Y that contains an arrow into X. In figure 2b, the back door path is simply X ← Z → Y, whereas in Figure 2c there is a longer back-door path: X ← Z ← U → F → Y.

There are three general strategies that can be used to estimate causal effects in this approach (see Figure 3 for a simple representation). The first strategy is to condition on variables that block all back-door paths from the causal variable X to the outcome variable Y. One first needs to calculate the association between X and Y for different subgroups’ values of the condition variable C. Then, averaging the associations of these specific values over the marginal distribution of the values c taken by C corresponds to the average treatment effect in the counterfactual causality literature. In figure 3a, conditioning on C identifies the causal effect of X on Y (Morgan and Winship, 2007: 38). In figure 2c, conditioning on F also blocks the back-door path from X to Y. An important finding derived from this vein of research is that controlling for all the potential omitted direct causes of an outcome variable is not always efficient, although we regularly use this practice in strategy studies. It produces inaccurate results, since back door paths – unobservable factors potentially affecting one or more control variables – cannot be taken into account by adding lines of controls in traditional statistical models. A properly applied conditioning strategy for a minimal number of variables – the ones that block back-door causal paths – is more effective at revealing causal relationships.



3a: Conditioning on C 3b: Instrumenting with T 3c: Mediating through M

Figure 3. Three strategies for causal effect estimation

Legend:
- → causal relationship
- - - → Presence of unobservable variable
- ● Observable variable
- ○ Unobservable variable

Strategy scholars have already used this strategy in producing estimates with treatment-effect methods (Hamilton and Nickerson, 2003; Shaver, 1998). For instance, when we observe the performance of firms that actually possess a certain resource, we do not examine what their performance might have been had they not this resource at their disposal. Because possession of a specific resource is not randomly attributable to firms and because resource possession and firm performance are likely to depend jointly on unobserved factors (as in figure 2b), a treatment effects procedure is often used to correct for the specification error and to avoid spurious causal associations (Greene, 2005; Maddala, 1983).

The second strategy is to use an instrument variable T for X to estimate its effect on Y. According to this strategy, the pursued goal is not to block back-door paths from X to Y, but to estimate indirectly the effect of T on Y, that of T on X, and then deduce the effect of X on Y, all other factors remaining unchanged. Hence, instrument variables enable one to isolate the covariation between X and Y (see figure 3b). These instrumental variable (IV) techniques are becoming increasingly popular in the strategy literature. The difficulty lies in finding an IV, that is a variable T that has a causal effect on X without being causally related to Y either directly or indirectly (via its effect on a mediating variable or the effect of unobservable factor that impact both the IV and Y distributions). Another issue concerns the degree of prediction of X by the IV, since ineffective prediction may produce incorrect estimates of the causal effect (Morgan and Winship, 2007: 216).

The third generic strategy is to find a mediator M that completely accounts for the causal effect of X on Y (figure 3c). If one is able to find such a mechanism, M can be used to estimate the causal relationship between X and Y even though it does not satisfy any of the back-door criteria. M is said to satisfy the front door criteria when (i) M intercepts all directed paths from X to Y; (ii) there is no back door path from X to M; and (iii) all back door paths from M to Y are blocked by X (Pearl, 2000: 82). In a nutshell, the mechanism M needs to be isolated (it influences Y) and exhaustive (captures all effects from X).

Applications. This kind of causal modeling can be applied to various research questions, but it specifically opens up new avenues in RBV research. For two decades, RBV has concentrated on explaining a firm's above-average returns through differences between its resources and past performance, and industry resource and performance averages. In the presence of many plausible common antecedents – that open back-door paths in the causal diagram – researchers face high methodological and empirical hurdles in demonstrating that differences in resource levels cause sustained differences in performance. In other words, a firm's resource differential vis-à-vis that of its rivals covaries with past performances (both the firm's individual performance and the rivals' average performance) and is plagued with endogeneity issues (common antecedents). On this basis, one cannot establish whether a statistical association between resources and sustained performance is a causal relationship.

Recently, studies have tackled this problem using a Bayesian approach to avoid the liabilities of classical statistical methods (e.g., that an average association is not specific to any given observation; that outliers must be eliminated from empirical models on the grounds that they bias estimations even though RBV's purpose is to explain extreme performance). Bayesian methodology allows a full estimation of individual effects, a prediction of 'what-if' results, and robust results with small samples or skewed data (for further discussion, see Berry, 1996; Hahn and Doh, 2006; Hansen *et al.,* 2004; Powell, 2001). This approach can lead to promising results around the RBV resource-performance relationship, complementing the causal modeling approach we focus on in this paper.

We present a causal diagram in figure 4 that shows the relationships between past and current performance Y, both direct, mediated by resources R, and mutually dependent on unobserved variables U. Resources and past performance mutually depend on observable variables O and unobservable variables V. Studying the statistical associations between R and Y is doomed to fail, since there are many back-door paths via V, O, past Y, and U. The first strategy, conditioning on a variable that blocks all back-door paths, is inapplicable. Conditioning on one of the Os leaves open the back-door paths via the unobservable variables U and V. Conditioning on past performance does not block paths via O and U. Instrumentation, the second strategy, could work if we were able to find a purely random instrument that is not related to other organizational variables (from O) or to performance Y. However, this condition is extremely restrictive, and it is highly unrealistic to assume that such an instrument could be found or developed.

A promising avenue is to seek an isolated and exhaustive mechanism that respects the front door criteria (the third strategy.) We could argue that the causation initially associated with the ’strategic resource - competitive advantage’ relationship does not originate from the resources themselves, but from their properties: e.g., rareness, immobility, low imitability, low substitutability, or path-dependence. In Figure 4, P is displayed as a mechanism that blocks back-door paths and follows the front-door path criteria. For this strategy to be fruitful, one needs to assume that 1) the organizational factors O (that influence R and past Y) and P are independent, and 2) the unobservable factors U and V do not influence P. Accepting these restrictive conditions, this solution represents a future research avenue for isolating and estimating the impact of given resources on performance, as mediated by the properties of these resources.

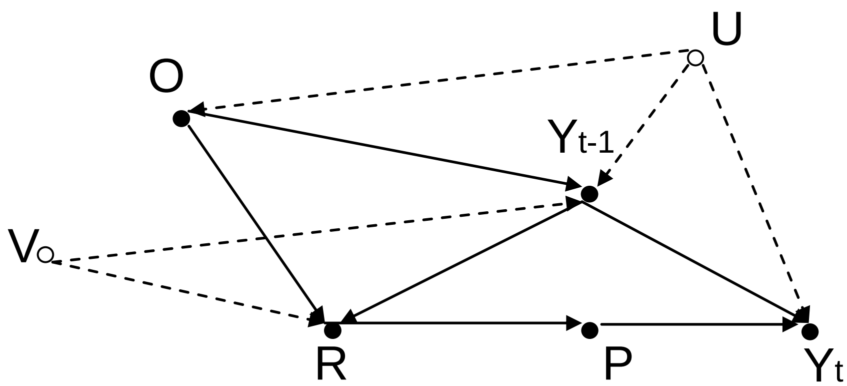


Figure 4. Properties as mediating mechanisms in causal relationship between resources and performance

Legend:
→ causal relationship
⇢ Presence of unobservable variable
● Observable variable
○ Unobservable variable

Thus, to better understand the causal mechanisms constituting competitive advantage, it is fruitful to shift attention from the mere possession of specific resources to questions of how particular properties mediate the impact of these resources on performance. It follows that the RBV is non-causal if located only at the resource level, since it is logically impossible to prove causation between a resource and the purported advantage materialized at firm level. Traditional RBV studies may thus mistake resources for their properties (for a further discussion, see Durand, 2006). Thus, we can argue that properties constitute a mediating mechanism that could help to estimate the causal influence of resources on firm performance with counterfactual analysis. As a result, competitive advantage would be defined as the conjunction of given resources and properties. This conjunction varies over time and space, which makes it a fascinating object of study. In particular, such a conceptualization seems to be able to combine insights from a realist perspective that views competitive advantage as a causal mechanism

(Durand, 2002; Wiggins and Ruefli, 2002) and a pragmatist perspective that underscores the role of local realities, perceptions, and interests (Powell, 2001; 2003).

DISCUSSION AND CONTRIBUTIONS

We began by stressing the urgent need to develop our understanding of causation in strategy research. Hence, our aim has been to supply some of the elements needed to establish a common ground for future research in strategy studies. We see a danger in constantly employing different paradigmatic approaches to the same questions that we aim at deciphering and modeling. We believe that closer attention to causal arguments is a requisite condition for a better-grounded theorization of strategy and for re-establishing strategy as a paradigmatic discipline rather than a garden full of incommensurable flowers. Our discussion on causation engages the field vis-à-vis the scientific value of our research, and our capacity to justify and exploit it to address organizational and socio-economic issues. By probing deep into the notion of causation, the role of causal mechanisms, the application of counterfactual reasoning principles, the construction of historical counterfactuals, and the representation of causal graphs we are better equipped to take up these challenges.

More specifically, this paper makes four contributions to our understanding of causation in strategy research: exposition of amenable epistemological conditions for the study of causation, development of a counterfactual approach, detailing of two methodologies for conducting such analysis, and suggestions for future research on competitive advantage. First, we have outlined four conditions that provide a basis for reconciling some of the epistemological disputes and advancing specific approaches such as counterfactual analysis. We believe that this stance helps us to go beyond the empirically driven regularity view on causation of standard positivist research by stressing the differences between statistical associations and causal relationships, by revealing how unobservables modify causal dependences, and by demonstrating that adding more control variables to equations does not make up for the problems posed by inherent causal paths. This view also facilitates dealing with the constructionist rejection of causation that is based on the regularity view. We also think that our position advances the realist work on causation by giving a concrete meaning to the notion of causal mechanism, by connecting series of observational data with evidence of the influence of unobservable variables, and by identifying relevant causal paths. Finally, our view acknowledges that causal research – as human and social activity – is driven by interests, interpretations, and a quest for satisfying and provisional explanations. In this sense, our view advances pragmatist insights in causal analysis without regressing into relativism.

Second, and most importantly, we have developed a counterfactual approach to causal strategy research. While this approach is well known in the philosophy of science (Collins *et al.*, 2004; Lewis, 1973; Woodward, 2003) and applied in areas such as historical analysis (Ferguson, 1997; Tetlock and Belkin, 1996) and causal modeling (Morgan and Winship, 2007; Pearl, 2000), it has not been given much attention in strategy research. Nevertheless, counterfactual 'what-if' scenarios do play a central role in causal reflection, and we argue that this reasoning should be as explicit as possible, including the deliberate construction of 'alternative worlds.' Our approach focuses on contrasting specific causal mechanisms with alternative counterfactual explanations. Pearl's description is accurate: "counterfactuals rest directly on the mechanisms that produce those worlds and on the invariant properties of these mechanisms" (Pearl, 2000: 239). Without a deeper comprehension of these mechanisms and their construction and testing, we as strategy scholars risk misinterpreting and misusing our findings and those of others as well. In the worst case, this may lead to the reproduction of fallacious causal ideas and claims.

Third, we have presented two methodologies for counterfactual-based strategy research. While there are other useful methods, we have promoted counterfactual historical analysis and causal modeling as alternatives for researchers conducting causal strategy research. In counterfactual history, one can combine thick empirical description with a systematic analysis of event-causality. This can and should lead to explicit presentation of propositions that are then contrasted with alternative histories (counterfactuals). With the help of the imaginary counterfactuals, one can eventually validate or invalidate the proposed arguments. In causal modeling, one can focus on the nature of the relationships between key variables: causal relationships, statistical associations, or covariations (in a decreasing order of directionality, stability, and dependence). This helps us to think more about whether we have identified the causal factors appropriately and whether we have correctly assessed the closure of a chain of causal relationships (i.e., identification and treatment of the back-door paths). In addition, we have shown how causal modeling based on counterfactuals integrates some of the most popular econometric techniques (e.g., treatment effect and instrument variables).

Counterfactual analysis is not a panacea. It must always be based on sound theoretical arguments and careful empirical analyses. While we have promoted counterfactual historical analysis and causal modeling as useful methodologies, we stress that both involve limitations, problems, and challenges. As discussed above, counterfactual reasoning does involve dealing with alternative chains of events, missing or at least incomplete data, retrospective recall, and other cognitive biases. However, these are precisely the kinds of issues that we have to deal with to advance causal strategy research. We believe that it is far better to tackle these issues head on rather than to avoid them altogether.

Finally, our analysis also has implications for our understanding of competitive advantage. The conceptualization of competitive advantage as a causal mechanism is one way to deal with the ambiguity surrounding this crucial issue. We argued that historical counterfactual analysis could advance something that has been scarce in our field: historical research on competitive advantage. In particular, counterfactual history can add to our understanding of the context- and culture-specific dependencies in the construction of resource-based competitive advantage and path dependence. We also illustrated the ways in which causal modeling elucidates causal associations around competitive advantage. In particular, we offered new insights into the lingering dispute around the causal relationship between resources, competitive advantage, and performance. In particular, we argued that resource properties could be seen as mediating mechanisms in these causal relationships.

In conclusion, the fundamental questions examined by strategy research revolve around the actual effects of strategic action. Without sufficient agreement on the notion of causation, however, we risk losing relevance, wasting our efforts, and failing to accumulate knowledge. In this paper, we have examined traditional views on causation, outlined a reconciliatory epistemological position, introduced counterfactual reasoning, and detailed two methods to probe causation. Our goal is to pursue this fundamental discussion in ways that reduce distance between current postures instead of stressing their differences. While we are not saying that all strategy scholars should now engage in counterfactual analysis, a lack of epistemological and methodological discussion on causation hampers the development of our discipline. It is time to move forward and be explicit about what we mean by causation and how it impacts research on key issues such as competitive advantage.

Acknowledgements: This paper is a fully co-authored paper, and the authors are listed in alphabetical order. We are very grateful for Professor Dan Schendel, whose advice and support have been crucial in this process. We also wish to thank our two anonymous reviewers for their excellent comments and insights. In addition, we are indebted to Juha-Antti Lamberg, Saku Mantere, Kalle Pajunen, and JP Vergne for useful comments and for helping out with cumbersome issues, and to David Miller for language revision. A first version of this paper was presented at the Atlanta Competitive Advantage Conference, where we received extremely valuable comments from Margaret Peteraf and participants.

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