Abstract
Power plays a significant role in many organizational theories such as resource dependency theory and transaction cost economics. It allows the strong companies to win more than others, or more broadly, to coerce others to do what they would not otherwise do. Power can seriously affect the confidence and commitment between parties. This paper aims to analyze the power concept in inter-organizational relationships. We discuss some formal results modeling power and the set of elements and properties necessary to understand these concepts. We also proposed a "power generation process" that allows to describe how power is developed in a relationship according to dependency. As far as we were able to browse the scientific literature, these are the first attempts to suggest a robust foundation of the power theory.

Keywords: Power; Dependence; Dominance; Collaboration, organization.
1. Introduction

One of the primary factors that deeply influences the development of relationships between companies is power imbalance. This imbalance is primarily observed because a stronger company could impose unfavourable conditions on weaker partners. Generally speaking, power can be understood as referring to the extent to which individuals feel that they can exert influence over the outcomes and experiences of others. The concept of power allows us to consider the environment of a firm as a moving, dynamic and open to the balance of power in which everyone can act to impose a new structure.

This paper examines the power relationship among inter-organizational relationships, because this is an important issue and research in this area is scarce. The role of power is crucial, it can seriously affect the confidence and commitment between organization (Xiaende Zhao et al., 2008), (Leonidas C. Leonidou et al., 2008). The analysis of power between partners is a pertinent methodological key to understanding the behavior of each member and its influence on the global strategy of the partnership. For example, in cases where one party has more power than the other, the stronger party seeks to exploit the dependence of its partner and create terms of trade to favor itself. The weaker partner therefore may even engage in a preemptive strike against the stronger partner to protect their known assets. Power in inter-organizational relationship is likely to significantly influence the distribution of responsibilities and the flow of benefits. The famous Five Forces model of Porter (Michael Eugene Porter, 1982) involves a struggle for power over buyers and suppliers, parties actually perceived as representing threats to the success of any focal firms. A subjective sense of power refers to the extent to which individuals feel that they can exert influence over the outcomes and experiences of others (W.C. Benton M.J. Maloni , 2000),(Sean M. Handley and W.C. Benton Jr, 2012).

One of the primary concrete motivations of a research study examining power is that it could help avoiding possible future conflicts and malfunctions that may occur during the operational phase of product design or due to the implicit decision imbalance within a supply chain. Analysing power situations has the advantage of framing a company within a network of interdependence. It leads decision-makers to think of their company as a node of a larger network on which they depend.

The objective of this paper is to examine various aspects of power. This paper contains exploratory results to model power in inter-organizational relationship. It focuses on a detailed analysis of the situation of power imbalance/balance in inter-organizational relationships. In short, the main contributions of the paper are the followings:

1. **Power generation process**: The objective of this section is to know how the power is generated in a relationship according to dependency.
2. **Power balance/imbalance**: In this part we will analyze the positions of power. Organization must be able to know if they are stronger, weaker or balanced.
3. **Power situation**: Based on power's positions we will present the power's situations. Analyzing power situations allows to consider that an actor is plunged in an open and dynamic environment where every actor could act to impose its way to others or at least to attempt to influence them.
The paper is structured as follows. Section 2 gives a brief literature review about power, source of power and bargaining power. The third section discusses the power generation process. Sections 4 analyzes the power balance and imbalance. Section 5 analyzes the situations of power. Finally, conclusions and perspectives conclude the paper.

2. Literature Review

The primary purpose of this section is to examine shortcomings of different contributions relating to power. We present some definitions proposed by different authors.

2.1. Power

According to Cox (Andrew Cox, 1999), (Andrew Cox, 2004) power has great importance for practitioners as well as academics. The concept of power can be understood and defined in many ways depending on the context. It is not only a subject of social science research but also of marketing and business strategy. (Lukas Koning et al., 2011) believe that the notion of power is one of the more confusing and elusive concepts despite its common usage. Defining the concept of power in an uncontroversial manner has been proven to be difficult. Several definitions (Anthony Giddens, 1987), (S. Lukes, 2005) see power as a personal attribute derived from the process of achieving a goal. Others (R. A. Dahl, 1957), (Anthony Giddens, 1987), (Henry Mintzberg, 2003) consider it owning a social relation that lies in the ability to persuade others to do some actions that they would not otherwise do. When one party exerts control over another, it influences another party in order to achieve desired outcomes. Although power is commonly expressed as the ability of one party to influence the other one, controllability is best viewed as an outcome of power and results when one party is successful in modifying another's behaviors (Sean M. Handley and W.C. Benton Jr., 2012). This is the consistent distinction between the ability to influence and the control (Jakki J Mohr, 1996). Reviewing relevant literature, one has little hope to find an agreement about the concept. Power is defined in various ways within a number of different fields. (M. Weber, 2009) defined power as "the probability that one actor within a social relationship will be in a position to carry out his own will despite resistance, regardless of the basis on which this probability rests"

In the psychological literature, power is the ability of the individual to make a difference to a pre-existing condition (Thomas Hobbes, 1968). The power of person A over person B is determined by the strength that could have A and B on the resistance of B. Mathematically the power of A over B is defined as "the quotient of the maximum force that A causes B and the maximum resistance that B could offer (R.M. Emerson ,1962). In general, the psychological point of view of power is much more based on relationship and behavior of individuals, that power is an ability or capacity to change or modify the behavior of other individuals in a dyadic relationship to achieve the desired results through a set of rewards or punishments.

In sociology, the notion of power was mainly introduced by (M. Weber, 2009), who defined power as the probability that an actor in a social relationship will be able to conduct his own will despite resistance, regardless of the basis on which this probability rests. (George C. Homans, 1961) states that A has power over B, to the extent that A can affect the behavior of B through the exchange. For Emerson the power of A over B is the resistance on the part of B which can be overcome by A (R.M.
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 Emerson, 1962). Another definition most often cited: A has power over B to the extent that A can get B to do something that B otherwise do (R. A. Dahl, 1957). For this definition is still limited because the power when it is to change someone's behavior is (Henry Mintzberg, 2003) a subset of the power as producing results. It is not always necessary to change behavior to get something, it is not necessary to change behavior for the power [39].

It is acknowledged that there are many different areas of research, where the concept of power is discussed. These include sociology, organizational change, economics and marketing. Not unsurprisingly there is no consensus on neither the definition of the phenomenon nor the dimensions that exist within the concept. However, taking into account the above-mentioned definitions and the research adopted, power is defined here as the ability to influence the decision-making process and actions of the other party.

2.2. Source of power

We consider two actors A and B. A has ability to control or influence B, because A possesses a source of power (T. Russell Crook and James G. Combs, 2007) (or indicators according to (Qile He et al., 2013), (Marc Zolghadri, 2088) or power resources according to (Jacques Rojot, 2006). Sources of power are the assets that form the basis of one partner's control over another. A's sources of power might include factors such as A's knowledge, skills, scarce resources, expertise, etc. that B needs in a specific context. The power of any given actor in a relationship is a function of the sources of power available to him at any given time (Adel I. El-Ansary and Louis W. Stern, 1972). For (Andrew Cox, 1999), (Jakki J Mohr et al. 1996) the control of information and information as a source of power are seen significant. According to (Henry Mintzberg, 2003) power is based on 1) control of a resource, 2) technical expertise, or 3) a set of crucial knowledge for the company. For (F McDonald, 1999), strategically important technology can be considered as the source of the actor's power.

In 1959, John French and Bertram Raven (D. Essabbar, 2014) identified five sources of power (base of power. See Table1), namely: coercive, referent, legitimate, expert and reward power: Legitimate power is derived from the status that a person holds in an organization. Expert power is the ability to influence the behavior of others based on the skills, knowledge, prior experience or expertise in a particular area. This is a function of the sum of what is known by a person from the rest of the team members in organization. Coercive power refers to a person's ability to influence others via the use of threats and punishments. Reward power means the extent to which a person can control desired resources such as money, gifts or promotions. Referent power stems from the impact a person has on others. This is based on charismatic leadership of the power holder.
Table 1. A review of the literature on sources of power

<table>
<thead>
<tr>
<th>Authors</th>
<th>Sources of power</th>
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<tbody>
<tr>
<td>Jeffrey Pfeffer and Gerald</td>
<td>Control of resources</td>
</tr>
<tr>
<td>Salancik (1978)</td>
<td></td>
</tr>
<tr>
<td>Hans B. Thorelli (1986)</td>
<td>Technology, expertise, trust, legitimacy, market share, size</td>
</tr>
<tr>
<td>M. Crozier and E.</td>
<td>Expertise, control of relationships with the environment, communication, use of</td>
</tr>
<tr>
<td>John Ramsay (1994)</td>
<td>Capacity, the volume of purchases and sales, the type of product</td>
</tr>
<tr>
<td>F McDonald (1999)</td>
<td>Control of information and technology.</td>
</tr>
<tr>
<td>Andrew Cox (1999)</td>
<td>Position and resources</td>
</tr>
<tr>
<td>K.S Cook et al. (1983)</td>
<td>Central position and connection</td>
</tr>
<tr>
<td>Soonchul Lee (1991)</td>
<td>The number of large customers, the market share of a supplier for a given</td>
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<tr>
<td></td>
<td>component, the number of suppliers from which a customer buys a particular</td>
</tr>
<tr>
<td></td>
<td>component, the number of potential suppliers for a given component and the</td>
</tr>
<tr>
<td></td>
<td>amount of revenue generated by a supplier from a single customer</td>
</tr>
<tr>
<td>Anni-Kaisa Kakhkanen (2014)</td>
<td>Network position, network role, Resources, capabilities, competencies, Resources</td>
</tr>
<tr>
<td>D. Essabbar et al. (2014)</td>
<td>Dependence</td>
</tr>
</tbody>
</table>

Table 2. French and Raven's Source of Power

<table>
<thead>
<tr>
<th>Base of power</th>
<th>Definition of J. French and B. Raven (1959)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coercive power</td>
<td>Coercive power of O/ P stems from the expectation on the part of P that he will be punished by O if he fails to conform to the influence attempt</td>
</tr>
<tr>
<td>Reward power</td>
<td>Reward power is defined as power whose basis is the ability to reward. Reward power depends on O's ability to administer positive valences and to remove or decrease negative valences</td>
</tr>
<tr>
<td>Legitimate power</td>
<td>Legitimate power of O/ P is here defined as that power which stems from internalized values in P which dictate that O has a legitimate right to influence P and that P has an obligation to accept this influence</td>
</tr>
<tr>
<td>Referent power</td>
<td>Referent power of O/ P has its basis in the identification of P with O. By identification, we mean a feeling of oneness of P with O, or a desire for such an identity</td>
</tr>
<tr>
<td>Expert power</td>
<td>Expert power of O/ P varies with the extent of the knowledge or perception which P attributes to O within a given area</td>
</tr>
</tbody>
</table>

In each case, a source of power lies in a company owning or controlling a scarce resource (R. Duane Ireland and Justin W. Webb, 2007). For example, because of their brands on the market, Wal-Mart, Ford and General Motors had price controls: they reduce the margins of their smaller suppliers (Sandra Mottner and Steve Smith, 2009). Table 2 shows some sources of power cited in the literature.

2.3. Bargaining power

The concept of bargaining power became popular in the engineering industries when Porter[37]
presented his five force model. This model "analyses the structure of an industry and shapes the nature of competitive interactions within an industry". These forces are as follows: the threat of substitute products, the threat of established rivals, and the threat of new entrants, the bargaining power of suppliers, and the bargaining power of customers. Bargaining power is a fundamental factor behind any inter-organizational negotiations, because organizations seek to improve the terms and conditions of the exchange by bargaining [40]. Bargaining power is determined by capability to bargain[2]. Because each party involved has personal interest in cooperating in order to achieve a mutually beneficial agreement, bargaining is the result of parties' competing interests concerning the specific terms of the agreement[9].

3. Power generation process

3.1. Power relationship

Having examined different aspects of power, we conclude that power generally refers to the ability or potentiality to influence or to control intentions, decisions or actions of others in the pursuit of its own objectives or interests. We can analyze power relationship between two actors A and B according to two points:

1. The power between A and B, that we note \( P(A, B) \) is consequence of a relationship established between A and B. \( P(A,B) \) means that a power exists between A and B. No implication is made about the powerful/weaker actor.

2. The Power of A over B, that we note \( P(A/B) \) (or \( P(B/A) \) : the Power of B over A) is the result of the balance of powers of both actors associated with \( P(A, B) \).

3.2. Power generation

The dependencies between actors are considered as source of power in many studies (Eric Deakins et al., 2008), (G Zhuang, 2004), (D Essabbar et al., 2014). The partners' dependency leads to power imbalance and advantages a specific party which may limit the autonomy and constrain the behavior of the other party (Rodolfo Henrique Cerbaro, 2011). This assertion is based on the pioneering work about power in organizations of Emerson (R.M. Emerson, 1962): "power resides implicitly in the other's dependency". Interdependence exists when a party does not control all the conditions necessary for the realization of an action or a desired result. In the theory of resource dependence, (Jeffrey Pfeffer and Gerald Salancik, 1978) present dependency as the result of the exchange process and the requirements of organizations to acquire resources and engage in exchanges with their environment. An actor could know the value of the resources he offers and the dependencies he creates. Resources are broadly defined, as persons, assets, materials or capital used to realize a certain goal, including human, mental, and monetary. Stronger members might assess others dependencies and consequently their potential power.

The power generation process (Figure1) is used to describe how power is developed in a relationship according to dependency. This dependence is thus a manifestation of a hidden or
explicit relationship of needs and offers between the two actors. Needs are specified in terms of technology, product modules, tools, expertise, service, knowledge and human resources or techniques, such as specific machines. $P(A/B)$ depends on a dependency relationship established between actors A and B. This is saying that a demand-supply (of services) link is established between A and B no matter which one is the initiator of the contact establishment. B is therefore the actor who demands for a service and A could offer it.

Another important factor in analyzing power relationships is degree of power: Degree of $P(A/B)$, that we note $\overline{P}(A/B)$, assesses the value of power relationship. The degree of power can be represented by a mathematical application as follows: Let U be the set of actors and let A, B be two actors of U.

$$\overline{P} : U \times U \rightarrow [0,1]$$

$$(A, B) \rightarrow \overline{P}(A/B)$$

With $\overline{P}(A/B) \in [0,1]$. If B strongly depends on A, then we speak of a strong power close to 1. Otherwise, it is called a weak power close to 0.

**Figure 1.** Power generation process

### 4. Power balance/imbalance

Power is a reciprocal relationship between two actors. It means that no power is only unidirectional,
that is, if B has power over A (i.e. $P(B/A)$), then necessarily A has power over B (i.e. $P(A/B)$).

Power relationship is actually a set of two relations of power and reciprocal power. These relations can have the same or different degrees. The existence of the reciprocal relationship may be a consequence of the direct or indirect relation. This pattern is expressed by:

$$P(A,B) \Rightarrow P(A/B) \land P(B/A)$$  \hspace{1cm} (2)

The notion of reciprocity in power relationships raises the question of evaluation of $\overline{P}(B/A)$ and $\overline{P}(A/B)$. In the case of inequality, the power model is called a model of dominance (D Essabbar et al., 2011), (D Essabbar et al, 2012), power imbalance (N.C.P. Edirisinghe et al. 2011) or power asymmetry (Gong Wang et al. 2013). Power asymmetry refers to the degree to which one firm holds substantially more or substantially less power than another. It is a situation in which an actor is in position to impose its order and its views. This is to say that:

1. If $\overline{P}(A/B) \gg \overline{P}(B/A)$ (i.e $\overline{P}(A/B)$ is much greater than $\overline{P}(B/A)$) then we can say that "A strongly dominates B" that we note $A \gg B$.
2. If $\overline{P}(A/B) > \overline{P}(B/A)$ then we can say that "A dominates B" that we note $A > B$.
3. If $\overline{P}(A/B) \approx \overline{P}(B/A)$ then we say that there is "balance of power between A and B".
4. If $\overline{P}(A/B) < \overline{P}(B/A)$ then we say that "A is dominated by B" that we note $A < B$.
5. If $\overline{P}(A/B) \ll \overline{P}(B/A)$ (i.e $\overline{P}(A/B)$ is much less than $\overline{P}(B/A)$) then we say that "A is strongly dominated by B" that we note $A \ll B$.

These cases of power imbalance are summarized in Table 3. Dominance refers to a situation in which an actor is in position to impose its order. The organization can obtain a positional advantage by filling some critical resources or services. Domination in inter-organization will be measured in terms of dependence of one actor compared with the dependence of another actor. Weber (M. Weber, 2009) defines domination as:

1. The probability that a command with a given specific content will be obeyed by a given group of persons.
2. Domination will thus mean the situation in which the manifested will (command) of the ruler or rulers is meant to influence the conduct of one or more others (the ruled) and actually does influence it in such a way that their conduct to a socially relevant degree occurs as if the ruled had made the content of the command the maxim of their conduct for its very own sake.
The level of dependency of other members on this critical aspect will either lead to a dominant position or a level of independence for the participant holding the positional advantage. For example, the dominant relationship of Toyota with its suppliers enabled the introduction of demand-pull and Just-In-Time (JIT) systems [29]. Dominant firms can drive innovations in their suppliers, but more importantly, they can control the flow of added value arising from those innovations. These cases of dominance and subordination (see Table 3) generate situation of power that will be discussed in the next section.

5. Power situations

Analyzing power situations has the advantage of framing a company within a network of interdependence. We consider power as a fundamental issue in inter-organizational relationship. It allows to consider a firm as an actor plunged in an open and dynamic environment where every actor could act to impose its way to others or at least to attempt to influence them. The most successful actors, in this case, are those who are able to analyze the situations. We define situation of power as structures of power balance/imbalance between two actors. The power situation is a consequence of domination pattern. These power situations describe mainly the relative position among actors. We can distinguish five power situations from the A’s perspectives:

1. Strong Domination (i.e. $\tilde{P}(A/B)?\tilde{P}(B/A)$): In this cases we say that $A$ strongly dominates $B$, and alternatives are not available for $B$. He is dependent on the eventual opportunism of $A$.

2. Domination (i.e. $\tilde{P}(A/B) > \tilde{P}(B/A)$): $A$ dominates $B$ which could be forced to make some concessions. $A$ will benefit from maintaining its low dependence and it will exploit $B$’s

<table>
<thead>
<tr>
<th>Power balance/imbalance</th>
<th>Situation</th>
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<tbody>
<tr>
<td>$\tilde{P}(A/B) &gt;&gt; \tilde{P}(B/A)$</td>
<td>$A$ strongly dominates $B$</td>
</tr>
<tr>
<td>$\tilde{P}(A/B) &gt; \tilde{P}(B/A)$</td>
<td>$A$ dominates $B$</td>
</tr>
<tr>
<td>$\tilde{P}(A/B) \approx \tilde{P}(B/A)$</td>
<td>balance of power between $A$ and $B$</td>
</tr>
<tr>
<td>$\tilde{P}(A/B) &lt; \tilde{P}(B/A)$</td>
<td>$A$ is dominated by $B$</td>
</tr>
<tr>
<td>$\tilde{P}(A/B) &lt;&lt; \tilde{P}(B/A)$</td>
<td>$A$ is strongly dominated by $B$</td>
</tr>
</tbody>
</table>

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weaknesses. \( B \) has more options to change the balance of power compared to the first situation (Strong Domination).

3. Equilibrium (i.e. \( \overline{P}(A/B) = \overline{P}(B/A) \)). A and B do not have a domination or subordination relation. Concessions will be made by both actors. Everyone officially recognizes that continuing to achieve mutual goals is in both companies' personal interests.

4. Subordination (i.e. \( \overline{P}(A/B) < \overline{P}(B/A) \)). A is dominated by B, B can make it accept some concessions. A therefore feels intimidated when B has power over its decisions and actions.

5. Strong Subordination (i.e. \( \overline{P}(A/B) = \overline{P}(B/A) \)). A is strongly dominated by B: This is a difficult situation for A, because B can make it accept some concessions. He is subject to eventual opportunism of B. The goal of A is not only to ensure continuity in its relationship with B, but also to structure his trade in order to change the balance of power [49]. In this case, the best for the A is to know as clearly as possible which constraints can be relaxed during the negotiation phase.

Stronger actors, if they are aware of their power, are usually less inclined to consider the needs of the weaker actors. Therefore, they are harder to be convinced for trade-offs. In some cases, a party could know or believes itself to be stronger but does not use its power for personal gain or for manipulating the weaker party's actions. This is a case of latent power. It is a consequence of choosing to not use the power. Some researchers (Henry Mintzberg, 2003), (Soonchul Lee, 1991), (Daniel J. Brass and Marlene E. Burkhardt 1993) suggest that power lies in its potentiality, and others suggest that power is only present in its use (powerful actor should exhibit a greater action orientation regardless of the social consequences of his acts). The distinction between having power and using it is important in the exploration of relationships in inter-organizational relationship. The choice to exercise power or not depends on the objectives of a party and its negotiation strategy: Spangler (Hans B. Thorelli, 1986) distinguishes positional bargaining from interest-based bargaining, which says that the reality of business negotiation is presumably a mixture of these two strategies.

1. Positional bargaining is an adversarial negotiation strategy. It is used by negotiators who see negotiation as a win-lose proposition. This may be the case of the situations 1, 2, 4 and 5.
2. Interest based bargaining is a collaborative strategy. It is an attempt by both parties to jointly meet the needs of each other. In this way, mutual interests are satisfied. This may be the case of the situation 3.

6. Conclusions and perspectives

The study of power is an important step to avoid possible conflicts in inter-organisational relationship. Power as an analytical tool has the advantage of framing an organization within a network of interdependence. Actors gaining power from other parties must know that the others still have some power that can be used opportunistically. This paper analyses the situations of power imbalance in the context of inter-organisational relationship. We presented a set of elements...
necessary for understanding power relationships. We also proposed a "power generation process", "power position" and "power situation" which allows us to understand the operational aspects of power and its impact on relationships between organizations. Understanding power relationships provides a deeper understanding concerning the factors from which organizations’ power stems. In a broader view, the conclusions that can be drawn from the power relations have to be put within an analysis approach which gives an interesting insight to a SWOT-like analysis.

This study shows implications for managers and practitioners as it provides a deeper understanding concerning the factors from which organizations’ power stems. From the perspective of organization managers, this is an issue worth studying that gives consideration to the need to understand the role of power as an influencing factor in organizational relationships. knowing these sources can help to work out strategies to deal with this behavior. Moreover, by enhancing the managers’ knowledge about power, the presented results help companies in their strategy development and operational decision-makings. On-going research looks at improving the assessment method of power value. We will also work on developing a power analysis framework to implement a strategic analysis tool.

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Power imbalance in collaboration relationships


