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Covalence and ionic bonding in business-to-business relationships: Insights from chemistry

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Abstract

The paper examines business-to-business (B2B) relationships using the framework of the covalence–ionic bonding theory in chemistry as an analogy to help make soft phenomena and relationships in B2B marketing more understandable to engineers and scientists in organizations and to managers with scientific and technical backgrounds. In the tradition of cross-fertilization of various scientific fields, the authors propose that the covalence–ionic bonding theory may provide insights in determining the factors that contribute to the emergence of bilateral, unilateral, and market relationships. This study compares and contrasts interparticle bonding with ways of managing B2B relationships. Beyond sheer analogy of the two phenomena, an explanation of B2B relationships and decision-making mechanisms is proposed. In adapting this concept theoretically, the meaning of the original parameters in physical science is assigned a new meaning in the marketing context. Furthermore, the paper extends conceptually the predictive capabilities of chemistry theories to relational behaviors in marketing. Drawing from a resource-based view of the firm, complementarity of resources and dependence levels are postulated to have critical roles in business bonding. Appropriate propositions are advanced, along with implications for managers and researchers.

Keywords: Business relationships; Dependence; Bonding theory; Complementary resources

1. Introduction

There is spirited and continuous exchange regarding the scientific nature of marketing. The opponents of marketing as a science argue that marketers fail to define the exact nature of the phenomenon under study. This resulted in failed attempts at generating a unified general theory of marketing (Hunt, 1991). In the absence of such a theory, marketing studies lack a comprehensive, focused, and impactful body of knowledge useful in advancing the underpinnings of the discipline. Adding to this challenge is the fact that many business-to-business (B2B) marketers have engineering and scientific backgrounds. Thus, this group is predisposed to view marketing theories and frameworks as somewhat "fuzzy" or "soft" when compared with their native disciplines in the physical sciences. Engineers, scientists, and others with scientific and technical orientations require more formalized and structured approaches to marketing problem solving. While the current paper does not contribute to the debate regarding the scientific nature of marketing or toward a general theory of marketing, it offers a potentially significant analogy between the formation of interorganizational and atomic bonds for both analysis and discussion. A fundamental goal of this research is to make some strides toward bridging the chasm between natural and social sciences in the best tradition of cross-fertilization of academic disciplines (Hunt, 1991).

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Although prior marketing studies provide an excellent conceptual backdrop from which to view the nature, outcomes, and even the dissolution of B2B relationships, a variety of issues remain unresolved (Frazier, 1999). A clear example of this is the paucity of research investigating the factors leading to different forms of relationship management, including hybrid variations to managing relationships. The current research builds upon the extant research on interorganizational relationships (Heide, 1994; Jap, 2001), contributions from the resource-based view of the firm (Wernerfelt, 1995), and inorganic chemistry research (Douglas, McDaniel, & Alexander, 1983), to develop analogies between atomic bonding in chemistry and interorganizational relationships in marketing. At the core, the paper compares three types of chemical bonds between atoms to three types of B2B relationships and illustrates the similarities through detailed analyses of industry examples. Drawing from covalence and ionic bonding theories from inorganic chemistry, this study attempts to uncover the antecedents of interfirm relations and proposes a method that could potentially estimate quantitatively the strength of the relationship.

2. Literature review

Beginning with the first empirical studies in the 1970s, tremendous progress has been made in understanding business relationships (Frazier, 1999). This is most conspicuous in the area of channels of distribution. Among the most important constructs in channel studies is interfirm dependency and power—how dependence structure and power relations are formed and how they functioned to improve business performance. Power is a property of social relations, not an attribute of an actor (Emerson, 1962). Because there is reciprocity of social relations, power resides implicitly in the other party's dependence. The power of A over B is equal to, and based on, the dependence of B upon A. The relationship where one partner has overwhelming power over the other tends to be unbalanced; that is, the more powerful partner tends to exert power to dictate more favorable terms of exchange. In these situations, a weaker party tends to develop other counterbalancing relationships with alternative organizations (Emerson, 1962), or adapts to the situation as needed (Hallen, Johanson, & Seyed-Mohamed, 1991).

To operate under a given power and dependence structure, firms require appropriate governance mechanisms to guide interorganizational behavior. Similar to corporate governance within a company, the term 'governance' has been extended to the realm of interorganizational relationship management (Nevin, 1995). Governance has been defined as a "mode of organizing transactions" (Nevin, 1995) or as a way to manage a relationship. Governance is considered to be the institutional framework that encompasses the initiation, termination, and ongoing relationship maintenance between a set of parties (Heide, 1994). Governance could take the forms of market or nonmarket, depending upon the dimensions and nature of the interfirm relations. Under nonmarket governance, the firms involved could have unilateral (hierarchical) or bilateral relationships (Heide, 1994). Although these governance forms are distinct, they are "ideal types" and are not necessarily independent. Many channel relationships are actually hybrid organizational forms, such as "clan-assisted markets" or "bilateral–unilateral" in nature (Heide, 1994).

Recently, business-to-business research and practice embraced the paradigm of relationship marketing. Relationship marketing refers to marketing activities directed toward establishing, developing, and maintaining relational exchanges (Hunt & Morgan, 1994). Given the plethora of perspectives on relationship marketing, the fundamental focus embraces firms' attempts to develop long-term relationships with certain customers or key accounts (Jap, 2001), as well as important suppliers. The process of developing such long-term bonds in business-to-business interactions has long been a focus of researchers' attention. The next section discusses theories of molecular bonding from inorganic chemistry to gain insights and draw parallels to bonding mechanisms between organizations.

3. Covalence and ionic bonding theory

In inorganic chemistry, the covalence bond theory is used to explain the bonding between many nonmetal atoms and compound groups. Ionic bond is found to connect between most nonmetallic and metallic atoms. Because of the different nature of electron configurations in atoms, the structure and strength of the bonding vary significantly, resulting in different chemical and physical properties of atom groups, molecules, or compounds. These differences in properties are apparent in the melting point, vaporization point, dew point, hardness, structural symmetry, conductivity, reflectivity, and, most of all, chemical reactivity of the compound. Similarly, business-to-business relationships exhibit noticeable differences, such as long- versus short-term orientations and differing levels of flexibility in terms of adjusting to the changes in the business environment. Additionally, there are varying degrees of goal congruence between parties that affect the degree of opportunism (Wernerfelt, 1995) and, ultimately, the strength of the relationship. In chemistry, covalence and ionic bonding theories have been developed to describe associations between atomic and submolecular particles and predict the properties of the resultant associations (Douglas et al., 1983). Generally speaking, there are three types of bonding between atoms that form a molecule: ionic bond, coordinate covalence bond, and dative covalence bond. All the bonds that exist between atoms are, in fact, "electron clouds", or electrons in the outer orbitals of the atoms that make up the molecule. The orbitals of the participating atoms are