

A General Dynamic Capability: Does it Propagate Business *and* Social Competencies in the Retail Food Industry?*

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ABSTRACT Given that firms have both business and social goals, an important unanswered question is whether a general dynamic capability breeds competencies in both these areas. In studies of the US retail food industry, we find that while a general dynamic capability affects firms' competence in supply chain management (a business competency), it does not affect their competence in environmental management (a social competency). Firm mission and the extent to which firms obtain technical assistance are found to affect the acquisition of this latter competency. These findings offer insights into the resource-based view (RBV) of the firm and provide lessons for corporate social responsibility. They reveal more precisely what a general dynamic capability yields and how far its reach extends, suggesting that the factors that drive competitive advantage are not the same as those that drive social responsibility.

INTRODUCTION

In this paper, we make a distinction between business and social competencies. We try to determine whether a general dynamic capability (Ghemawat, 2001) gives rise to both types of competencies in the retail food industry or whether other factors drive the acquisition of a social competency. A general dynamic capability is the ability 'to renew, augment, and adapt' competencies over time (Teece et al., 1992, p. 18; Tripsas, 1997; Winter, 2003). Activities that underlie a general dynamic capability include searching for new ideas and methods, comparing company practices to the best in the industry, evaluating practices in other industries, and experimenting. Inasmuch as these activities restore and replenish a

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company's set of competencies (Eisenhardt and Martin, 2000; Grant, 1996; Mota and De Castro, 2004; Pisano, 1994), they are fundamental to a firm's competitive advantage (Collis, 1994, p. 143).

There are a number of important questions about a general dynamic capability. One question is determining how far back to go to determine its origins – what are its antecedents? The answer to this question is akin to an enigma. It is similar to philosophical and theological speculation about a 'first cause' (Collis, 1994, p. 148). Another question is what are the consequences of a general dynamic capability – where does it lead? To list everything it leads to may be impossible, since what it leads to may be found in 'multiple dimensions' in nearly everything a firm does (Collis, 1994, p. 147). It has the potential to breed many competencies (Barney, 1986; Levinthal and Myatt, 1994; McGrath et al., 1995; Miller and Shamsie, 1996).

The question we ask in this paper is whether a general dynamic capability can breed both business and social competencies. This issue has important implications for the literature on corporate social responsibility. Firms have separate business and social goals that sometimes conflict (Carroll, 1993; Clarkson, 1998; Donaldson and Preston, 1995; Jones, 1995; Sethi and Falbe, 1987). As private, profit-centred organizations subject to criticism, they have to deal with challenges posed by emerging social issues and the law (Preston and Post, 1975). Arguments have raged about the extent to which firms should respond to these issues and the extent to which they do (Gatewood and Carroll, 1991; Hosmer, 1995; Jones and Dunfee, 1994; McGee, 1998, p. 380; Suchman, 1995; Wood, 1991). What is indisputable is that they require competencies to respond to them. Competencies are sets of interdependent and related skills. A business competency is a set of interdependent and related skills whose purpose is to enhance a firm's economic interests, and a social competency is a set of interdependent and related skills whose purpose is to benefit society (Nelson and Winter, 1982; Winter, 1987).^[1] A social competency does not have to work for the benefit of society at the expense of the firm's economic betterment. If a social competency is also able to improve a firm's economic standing, it is an added plus – a win-win result.

If a general dynamic capability leads to the acquisition of both business and social competencies, then this would support Freeman's (1994) argument that the distinction between business and social responsibility is not valid, and dichotomizing the world in this way perpetuates a separation fallacy (Wicks, 1996). The same qualities and skills, such as sensitivity to outside forces and creative adjustment to external pressures, apply to both (Alexander and Buchholz, 1978; Ullman, 1985). Excellence in one area carries over to the other (Marcus, 1996). Promoting a firm's business goals, then, promotes corporate social responsibility.

On the other hand, if developing a social competency negatively affects a firm's profits, business judgment would dictate against acquisition. Governments can try to compel firms to acquire social competencies, but their success is often limited

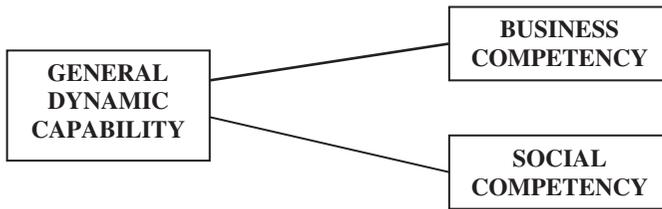
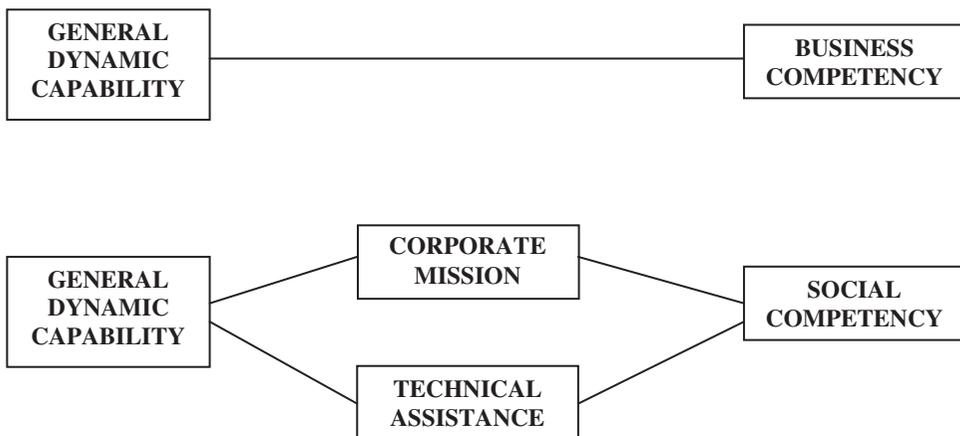
Model A: Inseparability**Model B: Separability**

Figure 1. Alternate models of the acquisition of business and social competencies

because of business opposition (Marcus, 1980, 1984). Only in situations where profits are not threatened are firms likely to be receptive to acquiring social competencies.

If the acquisition of social competencies is promoted by factors that either supplement or replace a general dynamic capability, such as having a broad mission and getting external technical assistance, then promoting corporate social responsibility would require actions other than merely aiding firms in the development of a general dynamic capability, such as convincing them to adopt broader missions that take external stakeholders into account and helping them obtain technical assistance. Figure 1 shows these distinct possibilities.

The remainder of this paper explores the question of whether business and social competencies have common origins in a general dynamic capability in the retail food industry. Building on the resource-based view of the firm (RBV), we develop hypotheses and carry out empirical analyses among a sample of firms in this industry.

THEORY AND HYPOTHESES

The Resource-Based View of the Firm

We extend ideas and concepts that originally developed as part of the resource-based view (RBV) of strategic management. RBV is a view rather than a theory, an evocative description (Miller and Shamsie, 1996) instead of a series of logically-deduced and tightly-related falsifiable propositions. Beginning with Penrose (1957), it has had more than 40 years of development (Grant, 1991) and has culminated in a flurry of papers in the last dozen or so years to the point where it is close to being a dominant paradigm in strategic management (Collis and Montgomery, 1995). Yet RBV is often criticized for being tautological in nature (Priem and Butler, 2001) with distinctions between concepts being 'subtle at best' (Barney, 1996, p. 144; see also Barney, 1991; Bogner et al., 1999).^[2] For us to develop our argument, a better understanding of these concepts is both important and necessary (Amit and Shoemaker, 1993).

In economic theory, resources are mainly financial capital, labour, and physical property. Tangible, protected by legal rights, they have prices, and can be possessed, owned, transferred, traded, bought, and sold in the market (Hall, 1992, 1993). RBV broadens our understanding of resources to include capabilities and competencies. Less measurable, analysable, understandable, and tradable than financial capital and physical property (Dierickx and Cool, 1989), capabilities and competencies cannot be as easily owned, transferred, bought, or sold. As the cumulative outcomes of historical processes (Levinthal and Myatt, 1994) that resist social engineering (Barney, 1991), they cannot be easily acquired and thus they have more value in deterring competition (Rubin, 1973; Wernerfelt, 1984). They may be compared to recipes, software, and artistic sense and technique, while financial capital, labour, and physical property may be compared to ingredients (Winter, 1987), hardware, brushes, canvasses, and paint (Itami and Roehl, 1987).

In RBV, the terms capabilities and competencies often are used interchangeably as synonyms that connote capacities, endowments, skills, and aptitudes (Bogner et al., 1999). Though frequently substituted for each other, the literature also suggests that there are a number of differences between them (Prahalad and Hamel, 1990). According to Prahalad and Hamel (1990, p. 84), capabilities are 'building blocks' that 'aggregate' into competencies. These writers maintain that while companies can have as many as 30 or more capabilities, they have less than five or six competencies. Capabilities represent the system's separate components, while competencies represent its realized wholes. Capabilities suggest potential, while competencies connote achieved proficiencies. Capabilities are thus the insides, filling, detail, and matter – the separate elements in Porter's (1985) value chain, while competencies are the linkages and the completed totality. This distinction is similar to the one Henderson and Clark (1990) make between a system's

constituent elements and the architecture of how they fit together into coherent structures (Henderson and Cockburn, 1994).

Competencies allow the organization to tie together complementary and co-specialized capabilities. As they provide for synergy among closely connected and supportive elements (Ackoff, 1994), they are the connective tissue between components. They involve a complex harmonization of parts and therefore are difficult to imitate. Indeed, the more complex the integration among these discrete elements, the more difficult it is to comprehend and copy what the organization does and the easier it is to sustain a competitive position.

Competencies in Supply Chain Management and the Environment

To illustrate the distinction between competencies and capabilities and highlight the capabilities that compose each type (see King, 1995), we focus on the business competency of supply chain management and the social competency of environmental management. These competencies, possessed by firms in a number of different industries, are particularly relevant for companies in the retail food industry, which is the setting for our empirical analysis. While firms in many industries might benefit from a competency in supply chain management, this competency has become especially critical to firms in the retail food industry because of the increased threats they have faced in recent years (Kurt Salomon Associates, 1993). These threats have led firms to undertake actions to improve the effectiveness, efficiency, and responsiveness of the product supply chain, a complicated undertaking involving both people skills and technology (Stewart, 1997).

With competition in the food industry rising, acquiring a competency in supply chain management has been a key to the grocers' success. The aim has been to combine low cost and convenient food delivery by better linking suppliers and customers. Firms had to acquire many constituent capabilities to do so, including: new information systems that better connected customers, wholesalers, and manufacturers; greater food chain integration; stronger alliances with retailers and vendors; leaner inventories; lower inventory costs; and better logistics.

A business competency in supply chain management starts with capabilities such as close ties to suppliers and detailed information about customer behaviour and market trends, which promote an understanding about what is happening in the field, what is selling and what promotions are working. Other capabilities include low cost supply sources, well-trained people, direct sending of point-of-sale data to suppliers, continuous contact among distribution centres, efficient delivery and ordering systems, rapid inventory replenishment, and cross docking (Stalk et al., 1992). Achieving a competency in supply chain management requires that these elements be brought together and related in complex ways to form a coherent whole.^[3] Thus, grocers have been trying to reengineer their supply chains and

create better relationships with suppliers which will yield higher product turnover and greater sales per square foot (McKinsey and Company, 1996).

A literature similar to that which deals with business competencies (e.g. Henderson and Cockburn, 1994; McGrath et al., 1995) has started to emerge with respect to environmental management as a social competency. Russo and Fouts (1997), Sharma and Vredenburg (1998), and Christmann (2000) were among the first to place environmental management in this category. Companies in a variety of industries have made progress in acquiring this competency (Christmann, 2000; Gladwin, 1993; Hart, 1995; Porter and van der Linde, 1995b; Sexton et al., 1999; Sharma and Vredenburg, 1998; Shrivastava, 1995). The standard economic assumption is that spending by firms on environmental activities imposes significant costs and slows down productivity improvements (Jaffe et al., 1995). This assumption has been challenged, and several case studies (e.g. Basta and Vagi, 1988; King, 1994; Porter and van der Linde, 1995a, 1995b; Sheridan, 1992) have provided evidence that environment spending can, in fact, enhance a firm's competitiveness. Porter (1991) has argued that environmental challenges, by inducing firms to utilize alternative business processes, may improve their productivity. A growing body of work supports the idea that under some circumstances it 'pays to be green' (e.g. Gladwin, 1993; Hart, 1995; Russo and Fouts, 1997; Shrivastava, 1995). Banerjee (2001), indeed, found that a rationale for environmental initiatives is often lower costs, but the idea that expenditures on the environment positively affect firms continues to be very controversial (Majumdar and Marcus, 2001). Though acquiring a competency in managing the firm's impacts on the natural environment may generate private benefits, such as less waste, greater efficiency, and higher margin products, (McGee, 1998), there is an additional goal – environmental improvement – which is not present when a firm acquires a business competency.

Yet in the same way that a business competency is composed of many constituent capabilities, so too is a social competency like environmental management. In the retail food industry, for instance, this competency might begin with initial capabilities including such practices as newspaper, plastic, and paper recycling. Additional capabilities could include involvement in consumer education, offering environmental products and services, engaging in advanced recycling (e.g. recycling wooden pallets, cooking oil, meat/fat/bones, or plastic bags), and systematically collecting and reporting information on waste generation and energy usage. The firm would likely have to provide education and training to managers and employees. To form the coherent whole of a competency, these capabilities would have to be brought together and related in complex ways.

Hypotheses

If the logic of inseparability holds, and distinguishing between business responsibility and social responsibility is a fallacy (Wicks, 1996), then the same general

dynamic capability that leads to business competencies should also promote social competencies. Since both a business competency and a social competency may contribute to a firm's competitive advantage – a general dynamic capability would have generative powers with respect to both competencies (Collis, 1994; Hayes and Pisano, 1994). The activities that make up a general dynamic capability – searching for new ideas and methods, comparing company practices to the best in the industry, evaluating practices in other industries, and experimenting – should therefore apply to both business and social realms and lead to excellence in each (Alexander and Buchholz, 1978; Marcus, 1996; Ullman, 1985). In our specific empirical setting of the retail food industry, a dynamic capability should affect the acquisition of competencies in both supply chain management and environmental management. Based on this reasoning, we posit that:

Hypothesis 1: A general dynamic capability leads to the acquisition of both business and social competencies.

We expect that a general dynamic capability is the main factor that brings business competencies such as expertise in supply chain management into existence, because such competencies yield private benefits that firms can more fully appropriate. However, with regard to social competencies like environmental management, other causes are likely to also drive their existence, since the acquisition of social competencies produce benefits that extend more widely to the firm's external stakeholders. When a given level of environmental protection is achieved, those who pay for it cannot exclude others from enjoying it (Marcus, 1996). The resulting gain is available to society-at-large, not just those who are directly tied to the firm.

Because environmental protection is a type of public good (Harris and Carman, 1987), whose full value a firm cannot entirely appropriate, factors other than a general dynamic capability may be needed to motivate its acquisition (Jones, 1995). Government's role is obviously quite important (Carman and Harris, 1987; Harris and Carman, 1987). Regulations compel firms to adhere to environmental standards. But most analyses of government requirements indicate that they fail to fully deliver on what they promise. Implementation breaks down, often because of substantial opposition from business, and results are only partial in accomplishing goals that legislators and citizens seek (Marcus, 1980, 1984).

In addition to laws, ethical obligations may play a role (Etzioni, 1990). These obligations are reflected in how a firm defines its mission (Carroll, 1993; Clarkson, 1998; Donaldson and Preston, 1995; Jones, 1995; Marcus and Goodman, 1991; Sethi and Falbe, 1987). Some firms define their missions more broadly than others. They include different stakeholders and their needs, perhaps making communities, customers, and employees top priorities. Other firms define their missions more narrowly – their main concern is profitability, though they may also

believe in conformance to legal dictates. In the context of the retail food industry, if a grocer's mission is broad and calls on it to take into account community concerns, customer welfare, and employee morale, then we would argue that it is more likely to acquire a competency in environmental management. However, if its mission is narrow and only requires the grocer to consider economic efficiency and legal imperatives, then we would argue that it would be less inclined to acquire this social competency. Based on this supposition, our hypothesis is:

Hypothesis 2: The degree to which a firm's mission is broad leads to the acquisition of a social competency.

Another factor that might affect the acquisition of a social competency such as environmental management is external technical assistance. Such assistance represents an enabling rather than motivating factor; that is, it may make it easier for firms to acquire the social competency, perhaps by reducing the complexity involved and hence the overall cost. Acquiring a social competency such as in environmental management, after all, requires some effort. If the private returns are not certain, firms may be less inclined to make this effort. They may not invest in a social competency which benefits the public at large and not just themselves. If the fruits of an investment cannot be fully appropriated by firms, they have less incentive to invest in the activities needed to acquire the social competency, but if this investment is subsidized through the provision of technical assistance, it may change the balance – firms may be more likely to engage in the activities needed to acquire the competency.

If the obstacle to acquisition is the proficiency of the firm's employees, then technical assistance should play an especially important role (Gulati et al., 2000; Heide and Miner, 1992; Kraatz, 1998; McEvily and Zaheer, 1999). For example, the firm will likely search for the know-how it needs to implement environmental projects, and it may try to acquire this expertise from a number of sources such as trade groups, government agencies, other companies, or consultants. Thus, the degree to which the firm seeks know-how will affect the extent to which it acquires a social competency such as environmental management. Therefore, we argue that if technical assistance exists and firms take advantage of it, firms would be more inclined to acquire a social competency. However, if technical assistance is not available or firms do not take advantage of it, they would be less likely to acquire the social competency. Based on this reasoning, we posit that:

Hypothesis 3: A firm's use of technical assistance leads to the acquisition of a social competency.

We conjecture that the effects of a firm's mission and its reliance on technical assistance might cancel out the impact of a general dynamic capability on social com-

petence acquisition. That is, it seems likely that a company's mission and its dependence on technical assistance are the *primary* determinants of its ability to generate a social competency. Therefore, we also posit that:

Hypothesis 4: Controlling for a firm's mission and technical assistance, a general dynamic capability does *not* lead to the acquisition of a social competency.

The empirical study that follows tries to determine if the acquisition of business and social competencies have common origins in a general dynamic capability, or if these other factors, a firm's mission and external technical assistance, drive the acquisition of a social competency (Barney, 1986; Levinthal and Myatt, 1994). Will the qualities associated with a general dynamic capability only breed the competencies necessary for business advantage, or are they also likely to spawn social competencies?

RESEARCH SETTING

The setting for this research is the retail food industry. This industry has been going through a fundamental transformation over the past 15 years. Changing consumer demographics and lifestyles, alternative whole meal replacement chains, specialty stores, hypermarkets, co-ops, deep discounters, and most significantly, general merchandisers like Wal-Mart have eroded market positions in this industry (Kinsey et al., 1996). By 1995, Wal-Mart already had 275 supercentres (Progressive Grocer, 1996) and was opening another 100 of these stores per year, each selling an average of \$20 million worth of food annually. Wal-Mart's distribution costs were estimated to be about 3 per cent of total sales, while those of the supermarkets were estimated to be about 6 per cent (Progressive Grocer, 1996). Thus, Wal-Mart and the other mass merchandisers had become major factors with which retail food outlets had to contend (Foley, 1996). The business competency of supply chain management is particularly important to this industry. The firms in the industry recognized the importance of supply chain management and organized a nationwide campaign in 'efficient consumer response' (ECR) to keep up with the supply chain efficiencies of chains like Wal-Mart.

Supermarkets are at the end point in a long chain of food distribution that starts with the grower and processor/manufacturer and moves through an assortment of wholesalers, distributors, and warehouses before final purchase and consumption by consumers. The average supermarket deals with many suppliers. Firms in the industry understand that supply chain improvement is important. Their managers believe that a programme to achieve greater supply chain coordination and cooperation can eliminate billions of dollars in waste. This entire effort is designed to have the right goods available to consumers at the right times and in the right proportions with a minimum of waste: 'The ultimate goal is a responsive,

consumer-drive system in which distributors and suppliers work together as business allies to maximize consumer satisfaction and minimize cost' (Kurt Salomon Associates, 1993). Although supplier and customer relations have been studied in other sectors (mostly in manufacturing; see Helper, 1991), they have not been examined in retail food.

Environmental management is a particularly suitable choice for a social competency in the retail food industry. While the importance of environmental management is clearly critical in industries like chemical refining and transporting, where lives are at risk and the damage to property can be extensive, it is less clear why grocers would need this competency or how it might provide a competitive advantage.

Though the environment affects many aspects of a grocer's business, in comparison to labour costs and competition, it was near the bottom of the list of priorities of US supermarket managers and their customers (Progressive Grocer, 1996). For these reasons, firms in the retail food industry have been slower to adopt environmental management and associated activities.^[4]

Nonetheless, numerous environmental policies and regulations affect retail food. They range from labelling to packaging, storage, handling, shelf-life, and transportation. Consumers also have concerns about health risks and about causes like bottling, packaging, and animal welfare.

While many managers in this industry saw the environment as a worthy objective, they believed that it cost money that could be better spent elsewhere. Already operating at very slim margins, many grocers wondered what the benefits were and if they could afford the expense. Even so, there was a fair degree of variation in the level of adoption of environmental management activities, and discretion in the extent to which grocers were focused on developing this social competency.

METHODS

The Pilot Study

Our investigation began with a pilot study involving a series of interviews and a small sample survey. We solicited volunteers for interviews through articles and announcements in a grocer's association magazine. We recruited managers from a diversity of stores by category (e.g. convenience, supermarkets, natural foods) and location (metro area and non-metro area), and conducted 11 in-depth, on-site interviews with either the store owner or manager. These in-store interviews were important in helping us better understand the nature of the industry as well as helping us design an initial survey instrument. This design also was based on discussions with representatives from the industry's largest trade group, the Food Marketing Institute (FMI), a review of previous FMI surveys, an international literature

search of best practices in the industry, attendance at national industry conferences, and discussions with key grocery leaders. Through these means, we developed a preliminary survey and distributed it to several grocers to test for viability, clarity, and ease of completion. Their feedback was used to fine-tune the instrument upon which we relied.

This pilot survey had questions pertaining to store characteristics, management policies and budgets, supplier relations, environmental management, implementation difficulties, and methods of obtaining external assistance. The 11 store managers that we earlier had interviewed completed the survey. In 1996, we mailed this survey to 120 grocers in a state grocer's association directory (every third grocer in the directory). We made follow-up calls to grocers who did not complete the survey. This resulted in an additional 30 responses for a total of 41 completed surveys. In several instances, we contacted and re-contacted the store owners and managers to check the accuracy of the data and to be certain that they understood the questions. The pilot survey was exploratory in nature. Because of the small sample size, we used it primarily to investigate characteristics of our measures, which are discussed in greater detail below.

The Primary Study

After establishing that our survey items were clear and understandable, we followed the pilot study with a large sample national survey. This second study was carried out under the auspices of the FMI and with their support. We mailed the survey to the headquarters of 806 grocery stores/chains located throughout North America in 1997. Based on FMI contacts, surveys were mailed either to the CEO, store owner, or environmental director. The sampling population was FMI's membership base. A total of 108 grocers responded, representing 5,810 stores, or a quarter of all FMI members. Survey respondents averaged 36,527 square feet, had yearly sales of \$16.21 million, and sales per square foot of \$502.45. In 1997, the year of the survey, the industry averages were 27,723 square feet, annual sales of \$11.04 million, and sales per square foot of \$398 (FMI's 1997 Food Industry Review). Thus, the survey respondents were larger than the average grocery, had higher sales, and had higher sales per square foot. These figures can be attributed to high survey return rates from large chains, which typically have larger, better run stores. Store performance figures, which grocers may be hesitant to provide, were verified based on published industry sources (Chain Store Guide Information Services, 1998). These sources were relied upon when there was missing data, or there was a 25 per cent or larger discrepancy with the information provided by the survey respondents. Thus, in the database we created we combined archival data with data from the survey.

The breakdown of where the survey respondents were located was as follows: rural, 22%; suburban, 55%; and inner city or metropolitan, 23%. The respon-

dents came from throughout the United States and Canada. The regional breakdown was as follows: West, 28%; Central, 26%; Southeast, 21%; Northeast, 19%; and Canada, 6%. With regard to market positioning, the main quality the respondents emphasized was high customer service (42%) followed by having an extensive variety of goods and services (18%).

Dependent Variables

Because there were no generally accepted definitions and operationalizations for most of our measures in this industry, we had to create new ones. In constructing these measures, we built upon the pilot study and the feedback we obtained from our collaborators within FMI, who had knowledge of the industry and experience with doing surveys. We also used exploratory factor analysis to investigate the properties of several scales used in the pilot study, and confirmatory factor analysis to verify the soundness of the environmental capability measures (these analyses are discussed in more detail below). If our samples had been much larger, we would have been able to conduct more extensive exploratory and confirmatory factor analyses on all of our measures (MacCallum et al., 1999). While we are confident that the measures we use are sound, they still are somewhat exploratory in nature and future research may be needed to further validate them. One aim of this study is to develop initial measures that will stimulate further research.

Supply chain management. Because the grocery industry wanted to improve its ties to customers and suppliers it started the campaign in Efficient Consumer Response (ECR). Our field research, literature review, and discussions with FMI suggested that better supplier and customer relations were the most important business competencies that firms in this industry were trying to acquire. We therefore have two measures of competencies related to supply chain management – supplier and customer relations. We measured supplier relations by asking respondents to indicate how well such statements as developing closer alliances with suppliers, reducing transportation costs, and using electronic data interchange (EDI) applied to their company (using five-point Likert scales with these anchors: 1 = to no extent, 2 = to a slight extent, 3 = to some extent, 4 = to a large extent, 5 = to a great extent). The reliability coefficient of the supplier variable we developed was 0.72.

Customer relations were another important aspect of good supply management. We measured them in a way that was similar to relations with suppliers. We asked respondents about the extent to which they developed a clearly targeted market niche, trained employees, carried out marketing research, and took a comprehensive approach to integrating the new practices they adopted. Respondents had to indicate how well statements applied to their companies using five-point Likert scales with the same scale anchors as those used in supplier relations. The reliability coefficient of this variable was 0.80.

Full mastery of the new skills in supplier and customer relations that the grocers were trying to achieve was hard for them to attain, and while what they had to do under programmes like ECR was well-known, their ability to actually carry it out took time and effort and varied from firm to firm. Because these competencies were neither quickly nor easily assimilated, they were thought to be hard to imitate and were considered sources of competitive advantage in this industry.

Environmental management. The problem we faced with a competency in environmental management was that there was no simple, generally accepted indicator of it in the retail food industry. Thus, we explored this concept along a variety of dimensions. In the pilot survey, we asked 44 questions dealing with environmental initiatives of various kinds and discovered that many of these items were extremely skewed because either all stores were engaged in the practices or none were. Eliminating these items resulted in a total of 26 items that had adequate variance and could be usefully relied upon to distinguish among stores. Because we wanted an aggregated measure of environmental management, a holistic view of the many complementary and co-specialized capabilities that make up this competency, we first took the average of these 26 items as our measure of a competency in this area. The 26 items used involve diverse capabilities, which if brought together as a whole would be difficult to copy; few grocers actually were amalgamating them and incorporating them into such a larger, systemic effort. We used a five-point scale where: 1 = we are not familiar with this practice, or we are familiar with the practice, but have not considered doing it, or we decided not to do this after considering it; 2 = we are currently assessing whether we should do this practice; 3 = we are doing this practice on a trial basis; 4 = we do this sometimes; and 5 = we do this all the time.^[5] The reliability coefficient of this variable is 0.90 and the 26 items used are presented in Table I.

Environmental capabilities. We then searched for specific measures of the separate capabilities that constituted this competency. Given that the competency was broad and we were observing considerable variance from firm to firm, we did not expect to find a clear or simple factor structure. It was simply the case that the complex harmonization of parts and integration among discrete elements typical of a well-developed competency like ECR did not exist in the case of environmental management. In other industries such as petrochemicals this competency may be better structured (Klassen and Whybark, 1999; Sharma and Vredenburg, 1998). Thus, we had to systematically search through the data to discover the capabilities that were beginning to converge as the constituent elements of an environmental competency. As there was little theoretical or other rationale to guide us in discovering them, we used factor analytic procedures. In particular, we conducted an exploratory factor analysis of the 26 environmental items in the pilot study (using maximum likelihood estimation and oblimin rotation, as recommended by Fabri-

Table I. List of the 26 survey items used to measure environmental management competency

Have an environmental policy statement
Print letterhead, business cards on recycled paper
Offer environmental education and training for store managers
Offer environmental education and training for store associates
Provide environmental reports to store or department managers
Participate in environmental organization(s)
Have an environmental task force or department
Sell reusable cloth shopping bags
Have a rebate programme for reusing bags
Carry product line made from recycled paper
Offer returnable milk jugs
Distribute brochures/flyers about environmental issues
Calculate energy budgets by department
Systematically collect data on waste generation
Systematically collect data on energy usage
Create charts and graphs reporting environmental information
Engage in aluminium can recycling
Engage in newspaper recycling
Engage in plastic bottle recycling
Engage in white paper recycling
Engage in wooden pallet recycling
Engage in cooking oil recycling
Engage in rendering (meat/fat/bones) recycling
Engage in film plastic bag recycling
Compost organic waste
Ask suppliers to reduce packaging/shipping materials

gar et al., 1999). Many of these 26 items loaded as single-item factors or loaded on multiple factors to a high degree. After removing these and rerunning the analysis, we ended up with a four-factor solution that was relatively easy to interpret. We labelled these factors: (1) employee training and education; (2) technical analysis; (3) advanced recycling; and (4) basic recycling. (See Appendix for the factor loadings and additional information.)

After identifying these factors in the pilot study, we ran a confirmatory factor analysis on the items in the larger sample, which resulted in a reasonable fit to the data. The values of the confirmatory factor analysis fit indices were as follows: goodness of fit index = 0.92, normed fit index = 0.91, comparative fit index = 0.96, and RMSEA = 0.074. Note that while the first three of these indices suggest a very good fit, the last ideally could be lower. While several of the reliabilities are very high – employee education (0.96) and technical analysis (0.84) – the scale reliabilities of basic recycling (0.65) and advanced recycling (0.53) are not that high and therefore our findings with respect to them should be interpreted with caution. As industry environmental practices mature and there is more consistency in what is typically done, we expect that more stable factors will emerge. This will lead to

a better idea of what the constituent capabilities of this competency are and how they are related.

Independent Variables

General dynamic capability. Our concept of a general dynamic capability was derived from such sources as Eisenhardt and Martin (2000), Hayes and Pisano (1994), Lenz (1980), and Ulrich and Lake (1990). A general dynamic capability has an external and internal focus with the aim being to achieve continuous innovation of a regular sort. The elements that constitute such a capability include: comparing one's practices to the best in an industry; evaluating practices in other industries for their relevance to one's own; promoting trial and error experimentation and learning; and constantly searching for new ideas and methods. As Eisenhardt and Martin (2000, p. 1105) state, though 'dynamic capabilities are idiosyncratic in their details and path dependent in their emergence', they involve '*significant commonalities* across firms (popularly termed '*best practice*'). This suggests that they are more *homogenous*, fungible, equifinal, and substitutable than is usually assumed' (emphasis added). For this variable we used the same format and anchors as we did with the business competencies. The reliability coefficient of this variable was 0.75.

Company mission. Given that a producer might not be able to appropriate all the benefits of its investment in an environmental competency, what reason does it have for acquiring it? The social responsibility and stakeholder literature (Carroll, 1993; Clarkson, 1998; Donaldson and Preston, 1995; Jones, 1995; Sethi and Falbe, 1987) suggests that company mission might be a factor. Some companies have broader missions than others. Their focus is on the needs of a variety of stakeholders and not just shareholders and complying with legal mandates. These companies consider community relations, customer welfare, and employee morale as top priorities. In the second survey, using a four-point scale we included items relating to company mission. A factor analysis was carried out which suggested that this variable should be broken down into three categories: narrow mission with the main focus being on cost reduction; narrow mission with the main focus being legal compliance; and broad mission with a company's top priorities being community relations, customer welfare, and employee morale. The narrow mission variables were single-item, but the broad mission variable consisted of three items and had a reliability coefficient of 0.79.

Technical assistance. An obstacle to acquiring a social competency might be that a company lacks proficiency. To overcome this impediment the company seeks technical assistance. In the pilot study, we listed 16 sources from which a company might secure this assistance: ten organizations from which the firm could obtain information to help it implement environmental projects, and six sources of infor-

mation such as articles from trade and professional journals, workshops, and conferences. Respondents were asked to indicate how frequently they used the organizations and information sources on seven-point Likert scales (1 = not familiar with organization, 2 = never used, 3 = used only once, 4 = used infrequently, 5 = used sometimes, 6 = used often, 7 = used very frequently). The organizations ranged from national ones in the retail food industry, such as FMI, to local retail food associations, the Chamber of Commerce, utility companies, consultants, government agencies, and other grocers. We did an exploratory factor analysis to determine if there were underlying factors and found that many of the sources of technical assistance either loaded on a single-item factor or cross-loaded to a high degree. Removing the problematic items and rerunning the analysis yielded a single factor solution that had such sources of information as FMI, other grocers, trade and professional journals, conferences, and workshops. The reliability coefficient of this variable was 0.83.

Control Variables

Though a number of performance measures were used in this industry (Coopers and Lybrand, 1996), including sales per employee and sales per checkout, *sales per square foot* is considered the most important. This indicator suggests rapid inventory turns and fast cycle times. It implies that the store's managers have a good grasp of the right assortment of merchandise to offer in the proper proportions and appropriate mix and have formed close ties with suppliers.^[6] We wanted to control for the possibility that firms who were better overall performers were in virtuous cycles and were more likely to acquire competencies of either an environmental or business nature.

We also controlled for supermarket *size* in terms of total square feet. We wanted to know if it was the case that larger supermarkets were more likely to acquire a business or social competency simply because they had the size and sophistication to do so. A third control variable was *chain size*, measured as the total number of stores within the chain. The rationale behind including this variable as a control is that larger chains may be more cognizant of both business and social competencies, and these competencies may be more important to these chains in terms of maintaining profitability and generating legitimacy. A final control we included was the *type of market* in which the store competed. The stores in our sample indicated whether they competed in rural, suburban, or urban markets. Suburban stores may be more prosperous and more attuned to customers' environmental preferences. To control for type of market we included two dummy variables, one for rural stores and one for suburban stores. The control variables – sales per square foot, store size, chain size, and type of market – helped us measure slack.

RESULTS

The means, standard deviations, and correlations of our variables are presented in Table II. The mean of the environmental management variable, 2.83, suggested that it was a lower priority than the business competencies as we thought might be true.^[7] Supplier relations had a mean of 3.35 and customer relations had a mean of 3.80. A general dynamic capability was significantly correlated with the two business competencies, supplier relations (0.68) and customer relations (0.63), as well as the social competency of environmental management (0.45). With respect to the capabilities that make up a competency in environmental management, there were significant correlations between a general dynamic capability and employee education (0.28), technical analysis (0.49), and advanced recycling (0.32). The correlation between basic recycling and a general dynamic capability was not significant, however.

To test our hypotheses we used multiple regression analyses. The regression models to test the first hypothesis were of the following form:

$$\text{Supply Chain Management/Environmental Management Competency} = \text{General Dynamic Capability} + \text{Control Variables}$$

The models to test the second, third, and fourth hypotheses were of the form:

$$\text{Environmental Competency/Environmental Capabilities} = \text{General Dynamic Capability} + \text{Broad Mission} + \text{Narrow Mission Variables} + \text{Technical Assistance} + \text{Control Variables}$$

Due to missing observations on one or more variables, we had a total of 75–77 cases. The missing data were primarily due to missing values on control variables.

We checked to make sure our data conformed to several underlying assumptions required of regression analysis. Given the significant correlations between the explanatory variables in our study, we checked for evidence of multicollinearity. The variance inflation factor values in all of our models were well below the cut-off value of 10 given by Neter et al. (1996), suggesting that multicollinearity was not a problem with this data set. We also examined the residual plots to check for evidence of heteroskedasticity, but found no evidence suggesting this might be a problem.

Because we collected most of our data from the same survey (which relied on self-reporting), we also tested for common method and common source bias. Parts of the survey were checked against archival data, when these data were publicly available, and when called for, we made corrections. The problem was that the published sources did not give much information about individual grocers, as most of the available information about this industry is at the chain level. Therefore,

Table II. Means, standard deviations, and correlations

<i>Variable</i>	<i>Mean</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>
1. Environmental management	2.83	0.82																
2. Employee education*	2.05	1.31	0.71															
3. Technical analysis*	2.03	1.28	0.68	0.40														
4. Advanced recycling*	3.23	1.50	0.44	0.10	0.38													
5. Basic recycling*	2.98	1.31	0.61	0.38	0.20	0.02												
6. Supplier relations	3.35	0.96	0.33	0.24	0.42	0.32	0.02											
7. Customer relations	3.80	0.74	0.41	0.29	0.48	0.33	0.07	0.50										
8. General dynamic capability	3.73	0.69	0.45	0.28	0.49	0.32	0.16	0.68	0.63									
9. Technical assistance	4.10	1.21	0.52	0.36	0.49	0.39	0.06	0.37	0.48	0.44								
10. Narrow mission: cost reduction	3.28	0.89	0.12	0.05	0.28	0.32	-0.09	0.19	0.36	0.25	0.27							
11. Narrow mission: regulatory compliance	3.19	0.98	-0.10	-0.01	0.27	0.16	-0.32	0.24	0.27	0.20	0.32	0.39						
12. Broad mission	2.52	0.95	0.54	0.51	0.35	0.25	0.25	0.40	0.50	0.53	0.38	0.19	0.08					
13. Store size	36,527	22,449	0.17	0.08	0.36	0.37	-0.15	0.37	0.41	0.39	0.37	0.24	0.34	0.16				
14. Store sales/square foot	502.45	218.52	0.34	0.23	0.02	-0.05	0.28	-0.16	0.09	-0.04	0.07	-0.13	-0.17	0.17	-0.24			
15. Chain size	53.44	166.55	0.29	0.26	0.38	0.21	0.08	0.31	0.25	0.20	0.18	0.19	0.14	0.13	0.24	-0.06		
16. Rural market	0.23	0.42	-0.40	-0.24	-0.35	-0.16	-0.13	-0.07	-0.44	-0.37	-0.38	-0.24	-0.07	-0.38	-0.25	-0.21	-0.23	
17. Suburban market	0.55	0.50	0.36	0.20	0.29	0.25	0.09	0.20	0.33	0.36	0.23	0.27	0.00	0.40	0.32	0.05	0.07	-0.60

Notes:

*These are the four environmental capabilities.

Absolute values greater than 0.20 are significant at $p < 0.05$, while values greater than 0.25 are significant at $p < 0.01$.

Table III. Results of regression analyses for competency measures

<i>Independent variables</i>	<i>Dependent variables</i>		
	<i>Supplier relations</i>	<i>Customer relations</i>	<i>Environmental management</i>
General dynamic capability	0.69***	0.49***	0.23*
Store size	0.13	0.19*	0.06
Store sales per square foot	-0.01	0.17*	0.33***
Chain size	0.09	0.19*	0.13
Rural market	0.26*	-0.15	-0.07
Suburban market	0.07	-0.03	0.26*
<i>F</i>	13.93***	15.06***	7.90***
<i>Adjusted R-square</i>	0.51	0.53	0.35
<i>N</i>	77	77	77

Notes:

Values are standardized beta coefficients.

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

we used Harman's one-factor test (as recommended by Podsakoff and Organ, 1986). The rationale behind this test is that if common method or common source bias is a problem, factor analyses should yield either a single factor or a clearly dominant factor that accounts for most of the variance. Principal components factor analyses of various combinations of the dependent and independent variables (using varimax rotation) consistently revealed multiple factors with eigenvalues greater than 1.0, with the first factor accounting for less than the majority of the variance. Thus, we concluded that common method and common source variance was probably not a significant problem.

The results of the regression analyses are presented in Tables III and IV. Table III shows that the general dynamic capability was a significant predictor of the supply chain management competency with which we were concerned, measured either as supplier ($p < 0.001$) or customer ($p < 0.001$) relations. For the supplier relations' model, the only control variable that was significant was type of market, suggesting that rural stores were more likely to have a competency in supplier relations. The adjusted r-square for this model was 0.51. For the customer relations' model, store size, sales per square foot, and chain size were significant predictors, suggesting that slack was an important factor. The adjusted r-square for this model was 0.53. These results supported Hypothesis 1, inasmuch as a general dynamic capability affected the acquisition of competencies in supply chain management.

The results also suggest that a general dynamic capability affected the acquisition of a competency in environmental management. Store sales and type of market (suburban) also predicted the acquisition of this competency. The adjusted r-square for this model was 0.35. This result provided additional support for Hypothesis 1.

Table IV. Results of regression analyses for environmental competence and capability measures

<i>Independent variables</i>	<i>Dependent variables</i>				
	<i>Environmental management (competency)</i>	<i>Basic recycling (capability)</i>	<i>Employee education (capability)</i>	<i>Technical analysis (capability)</i>	<i>Advanced recycling (capability)</i>
General dynamic capability	0.05	0.14	-0.09	0.12	0.09
Technical assistance	0.23*	-0.05	0.09	0.19†	0.31*
Narrow mission: cost reduction	-0.07	0.03	-0.09	-0.10	0.12
Narrow mission: regulatory compliance	-0.14	-0.31*	-0.06	0.10	-0.02
Broad mission	0.33**	0.21	0.40**	0.11	-0.03
Store size	0.07	-0.15	0.00	0.10	0.19
Store sales per square foot	0.22*	0.18	0.17	-0.04	-0.03
Chain size	0.11	-0.04	0.10	0.38***	-0.09
Rural market	-0.04	-0.04	-0.02	-0.03	0.10
Suburban market	0.19	0.04	0.09	0.11	0.25†
<i>F</i>	7.51***	2.37*	2.59*	6.44***	2.97**
<i>Adjusted R-square</i>	0.47	0.16	0.18	0.42	0.21
<i>N</i>	76	76	75	76	76

Notes:

Values are standardized beta coefficients.

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table IV shows the results for the overall environmental management competency model and also the results for the specific environmental capability models. These models include variables for company mission and technical assistance. Adding these variables to the overall model for environmental management substantially increased the variance explained; it went up from 0.31 to 0.47. The significant predictors were a broad mission (this supports Hypothesis 2), technical assistance (this supports Hypothesis 3), and the control variable – store sales. A general dynamic capability was no longer significant (this supports Hypothesis 4). As we predicted, factors other than a dynamic capability – a firm's mission and its reliance on technical assistance – drove the acquisition of the social competency. Because a general dynamic capability was significantly related (see Table II) to both a company's mission (0.53) and technical assistance (0.44), these findings suggest that the general dynamic capability exerted its influence on the acquisition of an environmental competency through its effect on company mission and technical assistance (see Figure 1, Model B).

Table IV shows that different predictors significantly affected the acquisition of each of the environmental capabilities. A narrow mission, one that focuses on regulatory compliance, was the only significant predictor of basic recycling ($p < 0.05$). The coefficient was negative; thus, firms whose purpose was regulatory compliance were not likely to engage in voluntary (unmandated) activities. A broad

mission predicted employee education ($p < 0.01$). Chain size ($p < 0.001$) and technical assistance ($p < 0.10$) predicted technical analysis, and technical assistance ($p < 0.05$) and suburban market ($p < 0.10$) predicted advanced recycling.

DISCUSSION AND CONCLUSIONS

This paper has empirically investigated the origins of two competencies – the business competency of supply chain management and the social competency of environmental management – in the retail food industry, showing that in this industry the business competencies of supplier and customer relations had common origins in a general dynamic capability. In the case of environmental management, it appears that if a general dynamic capability influenced the acquisition of this competency, it was only through a firm's mission and the extent to which it sought technical assistance. A broad mission, one that makes community relations, customer welfare, and employee morale top company priorities (Carroll, 1993; Clarkson, 1998; Donaldson and Preston, 1995; Jones, 1995; Sethi and Falbe, 1987), and technical assistance (Gulati et al., 2000; Heide and Miner, 1992; Kraatz, 1998; McEvily and Zaheer, 1999) were important determinants of a competency in environmental management.

Our theory and findings make a number of important contributions to practice and research. The practical implications are that if society wants to encourage the development of social competencies such as environmental management along with business competencies like supplier and customer relations, it cannot rely on promoting a general dynamic capability alone. It also must aim to broaden the mission of the firm to include the concerns of a variety of different stakeholders (Sharma and Vredenburg, 1998) and provide managers with ample opportunities to take advantage of technical assistance (McEvily and Zaheer, 1999).

Because our analyses are based on cross-sectional data, future longitudinal work would be especially valuable. Given our data we cannot be certain of causation. Complex feedback effects probably exist such that firms having existing competencies are likely to drive themselves further and strive for the acquisition of additional competencies. For example, at time T_0 , firm Gamma may have acquired capabilities Y_1 , Y_4 , and Y_5 that together constitute competency Z .^[8] At the next time period, T_1 , after Gamma had Z , it might acquire capabilities Y_2 and Y_3 , which further strengthen Z . At the next time period, T_2 , Gamma would have a set of capabilities consisting of Y_1 , Y_2 , Y_3 , Y_4 , and Y_5 and the competency Z . If our research takes place at T_2 , we cannot claim that all capabilities preceded acquisition of the competency Z .

Another example is if Omega Grocery starts out at T_0 with a mission statement that emphasizes a low cost strategy because their stores are located in working class areas. However, over the next dozen years, the areas begin to gentrify. Omega becomes a more high-end store, emphasizing among other things its pro-environ-

ment philosophy. By T_1 , it has years of experience in both the capabilities and competencies in environmental management. It also has a reputation in that regard among key stakeholders, particularly customers. In T_2 , the company decides to upgrade marketing and sales materials. It changes its mission, website, and grocery bags. In this case, the mission statement clearly came after the competency was attained.

To understand these complex feedbacks, future longitudinal work is needed. We also believe that the processes of competency acquisition could be fruitfully explored in qualitative terms via case studies, a good example of this kind of work being Barley (1986).

One of the significant contributions of our research is that we have demonstrated how a competency can be distinguished from a capability, both theoretically and operationally, and in so doing have advanced the insights that can be obtained from the resource-based framework. A competency ties together closely connected capabilities; it is the connective tissue between linked parts. Though a dominant paradigm in strategic management (Collis and Montgomery, 1995), RBV is often criticized for inadequate distinctions between its concepts. The terms capabilities and competencies have been used interchangeably, leading to conceptual confusion (Bogner et al., 1999). Competencies integrate capabilities and provide an architecture for their fit. In a manner that is consistent with prior work (e.g. Prahalad and Hamel, 1990), we have shown that there are a number of important differences between competencies and capabilities. We believe this clarification helps move RBV forward.

Our discussion of a general dynamic capability – what it actually means and how it can be operationalized – is also a contribution. The claims of what it can yield – what may be generated from it – have been extensive (Collis, 1994; Eisenhardt and Martin, 2000; Teece et al., 1997; Tripsas, 1997). We suggested that a general dynamic capability might breed a variety of different kinds of competencies. Yet our results found that a general dynamic capability bred competencies in supply chain management but not (at least directly) in environmental management. We show that while the claims about the generative capacity of a general dynamic capability have some merit, there are also limits to what it can yield. Its power extends in many directions including business competencies, but is at best weaker with regard to environmental management, the social competency we examined, where its impacts had to be supplemented by a firm's mission and technical assistance.

Another strength of our analysis is that we have begun to build a bridge between the strategy literature and the corporate social responsibility and stakeholder literatures. Recognizing that business and social competencies have different determinants, though they may overlap to some degree, will help to facilitate the transfer of knowledge between these different frameworks. Additional research about busi-

ness and social competencies, their determinants, and their consequences is clearly needed. We analysed a single social competency – environmental management. Other competencies that might lie under this rubric could be usefully evaluated, such as labour relations, fair wages, diversity, and food safety issues. Environmental management is not well developed or diffused in the US supermarket industry, which may explain why there was not a stronger relationship between it and a dynamic capability. Margins in the retail food industry are extremely thin and therefore the relationship between a general dynamic capability and the acquisition of any social competency in this industry may be muted. So long as the social competency is not absolutely critical, managers may not be especially zealous about acquiring it.

The operationalization of our variables (a general dynamic capability and the overall business and social competencies) is another contribution of our work, although it is clear that additional research in this domain is needed. Further research especially is needed on the constituent capabilities of environmental management. In this industry, as in others, the constituent capabilities of an environmental competency still are coalescing and in our study we did not really see definitive measures emerging. How these capabilities will evolve is an important question worthy of future study. Being secondary purposes of the firm, side-effects rather than direct effects of the dynamic capability, the acquisition of the capabilities constituting an environmental competency may not take place in the same way a business competency is acquired. Acquisition may be more incremental and piecemeal. Because each constituent capability will have a different factor associated with its acquisition, identifying what these capabilities are and what drives their acquisition is important.

Because there are unique conditions in the retail food industry that affect the acquisition of competencies, we feel that there is a need for replication of our findings in other industries. As we have indicated, in the retail food industry, the connection between environmental performance and business performance is likely to be weaker than in other industries. In manufacturing, particularly in sectors where resource usage is intensive like petrochemicals (Klassen and Whybark, 1999; Sharma and Vredenburg, 1998), the connection between environmental and business performance may be stronger. Whether the relationship is stronger is an empirical question that should be investigated.

Nonetheless, we believe this study is an important step in helping to clarify the distinctions between types of competencies – business and social – and between competencies and capabilities and in showing how they are acquired. It helps us understand the factors that determine why some companies strive for excellence, innovate, and acquire competencies more than others and we know that the acquisition of competencies – whether business or social – is very important for firms and societies. We look forward to additional analyses that will build on the under-

standings, both theoretical and practical, that we have generated. The dynamic understanding of competency development needs refinement and we hope this paper, which connects the strategic management and social responsibility literatures, has contributed to this effort.

NOTES

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- [1] Business competencies are meant to achieve economic goals, while social competencies are meant to achieve community benefits, but whether they actually achieve these goals is a different matter.
- [2] The circularity in RBV is that anything profitable must be a sound investment in a competence or capability.
- [3] Another example of a business competency would be one for product innovation and enhancement. It depends not just on product conception, design, and development. Other capabilities are needed, for example, creative people, the timely capturing of information about how customers use products, their level of satisfaction, and future requirements. These in turn depend on capabilities for formal market research, sales force training, feedback, and interaction among engineers, designers, and customers. Additionally, it may be necessary to have computer software, which allows for flexible manufacturing and testing, and a managerial philosophy, which shows patience in building margins and market share.
- [4] Notable exceptions are chains such as Whole Foods and Wild Oats and food lines such as Newman's Own.
- [5] These environmental items were originally measured using seven-point Likert scales that split the different parts of the first response category discussed above into three separate responses. Because we were interested in implementation, and the level of implementation for these first three responses was zero, we collapsed them together, thus converting the seven-point scale into a five-point scale.
- [6] Managers are able to link back to suppliers to provide goods at the appropriate moments and in the right amounts to provide customers with the correct mix of merchandise to maximize returns. In the grocery business, where many products are sold (dry goods, perishables, bakery, deli, fruits and vegetables, meats, and non-edibles such as cleaning products, greeting cards, cosmetics, and house wares), the challenge of choosing the right assortment of merchandise, obtaining it from suppliers, and having it on the shelves ready for the customer to buy is great (Food Marketing Institute, 1995).
- [7] The means of most of the environmental variables also were fairly low (<2.85 on a five-point scale) and the standard deviations rather high (0.82 to 1.50), suggesting that the answers were probably not heavily affected by social desirability.
- [8] We thank one of the anonymous reviewers for the examples that follow.

APPENDIX

Results of exploratory factor analysis for environmental capability measures

Items	Factor 1	Factor 2	Factor 3	Factor 4
<i>Employee education</i>				
Environmental education and training for management	1.00	0.20	0.16	0.28
Environmental education and training for employees	0.90	0.19	0.19	0.34
<i>Technical analysis</i>				
We systematically collect data on our waste generation	0.35	0.93	-0.01	0.41
We provide charts and graphs reporting environmental information	0.22	0.92	0.11	0.30
We calculate energy budgets by department	0.06	0.55	0.02	0.02
<i>Basic recycling</i>				
Plastic bottle recycling	0.16	-0.03	0.80	-0.30
Newspaper recycling	0.09	-0.07	0.75	0.05
Letterhead, business cards on recycled paper	0.45	0.39	0.71	-0.02
<i>Advanced recycling</i>				
Film plastic bag recycling	0.42	0.16	0.09	0.86
Cooking oil recycling	0.14	0.25	-0.17	0.53

Note: These four factors each had eigenvalues greater than 1.0, and together they accounted for 70.1% of the variance.

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