Chief Editor:
Ahmad Tootoonchi
College of Business
Frostburg State University
101 Braddock Road
Frostburg, Maryland 21532
Tel: 301-687-4740
Tootoonchi@frostburg.edu

Editor:
Carol Gaumer
College of Business
Frostburg State University
101 Braddock Road
Frostburg, Maryland 21532
Tel: 301-687-4052
CGaumer@frostburg.edu

Processing Manager:
Erin Mathews
College of Business
Frostburg State University
101 Braddock Road
Frostburg, Maryland 21532
Tel: 301-687-4019
EMMathews0@frostburg.edu

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Editorial Note

The spring 2012 issue of the *Journal of International Business Disciplines (JIBD)* has been the result of a rigorous process in two stages:

- Stage 1: all papers that were submitted to the 2011 IABD conference went through blind reviews, and high quality papers were recommended for publication in the *Business Research Yearbook (BRY)*.
- Stage 2: approximately ten percent of the articles published in the *BRY* and one invited manuscript (originally reviewed by the Chief Editor) were selected for possible publication in *JIBD*, and the respective authors were contacted and asked to resubmit their papers for a second round of reviews. These manuscripts went through a rigorous review process by the editorial board members and external reviewers. In the end, five articles were recommended by the editorial board for publication in the May issue of *JIBD*.

JIBD is committed to maintaining high standards of quality in all of its publications.

Ahmad Tootoonchi, Chief Editor
Journal of International Business Disciplines

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A CONCEPTUAL MODEL OF THE RELATIONSHIP BETWEEN EMPLOYEES' PERCEPTIONS OF AND ATTITUDES TOWARD CSR, ORGANIZATIONAL IDENTIFICATION, COMMITMENT AND EMPLOYEE BEHAVIOR

Priscila Alfaro-Barrantes, Florida State University
palfaro@fsu.edu

Yu-Kyoum Kim, Florida State University
ykim6@fsu.edu

Jeffrey D. James, Florida State University
jdjames@fsu.edu

ABSTRACT

The importance of corporate social responsibility (CSR) has been well-documented in the literature. From a management perspective, CSR has been found to influence organizational attractiveness, employees' commitment, and identification. However, the relationship between these CSR initiatives and employees' attitudes and behaviors needs further examination. Thus, this paper attempts to fill this gap. Specifically, the propose a conceptual model of the relationship between employees' perceptions of CSR initiatives, attitudes toward CSR, organizational identification, organizational commitment, and two outcome variables: citizenship behaviors and personal social action. Implications of the conceptual model are discussed, and directions for future research are proposed.

INTRODUCTION

Corporate social responsibility (CSR) has become a prominent area of study in organizational research and has assumed importance as organizations engage in socially responsible initiatives beyond those required by law (McWilliams & Siegel, 2001). These initiatives may lead to positive social change (Aguilera, Rupp, Williams & Ganapathi, 2007), positive personal social action (Ellis, 2008), as well as to an improvement in the quality of life for stakeholders (Cohen & Greenfield, 1997).

Cohen and Greenfield (1997) and Bhattacharya, Sen, and Korschun (2008) suggested that employees find CSR initiatives emotionally rewarding. For this reason, individuals may be more inclined to work for socially responsible organizations than for organizations that do not integrate CSR initiatives into their operations (Cohen & Greenfield, 1997). Furthermore, Bhattacharya et al. asserted that, when CSR initiatives are planned strategically, they will positively influence the relationship between the organization and its stakeholders, including

employees. In the present paper, the researchers examined the impact of CSR initiatives on a specific group of stakeholders, employees. The existing research that examines the influence of CSR initiatives on employees' perceptions, behaviors, and intentions is limited. Therefore, the purpose of this paper was to develop a conceptual model (see Figure 1) in which several relationships are proposed. First, a positive relationship between employees' perceptions of CSR and organizational commitment is proposed. This relationship is said to be potentially mediated by organizational identification. The proposed model depicts a moderating effect of employees' attitudes toward CSR. Finally, the relationship between organizational commitment and two potential employees' behaviors is addressed. Examining the impact of CSR on employees' perceptions, behaviors, and intentions not only extends the research in this area but also can benefit organizations as they can utilize CSR as a way of building identification, commitment, and other important attitudes that positively influence the work environment and overall organizational functioning. The relationships illustrated are discussed in the following sections.

THEORETICAL FRAMEWORK

This section explains the theoretical foundations of the proposed model (see Figure 1). First, the theoretical foundations of CSR will be addressed followed by an explanation of organizational identification, organizational commitment, and finally organizational citizenship behaviors and personal social action.

Corporate Social Responsibility

The majority of CSR studies have centered on the relationship between CSR initiatives and organizational (financial) performance, the impact of CSR on consumers, and/or the factors that influence CSR (c.f., Ellis, 2008). Though CSR initiatives became popular when they were mainly directed toward consumers, organizations have learned that these initiatives can also have a positive impact on other stakeholders' attitudes and behaviors. For this reason, organizations such as Ben & Jerry's, Starbucks, and FIFA have implemented CSR initiatives in which their employees are more actively involved (e.g., volunteer days, donations to non-profit organizations, etc.). Organizations in other industries (e.g., banks) have also started to follow this trend. An example of this trend is the partnership between Chivas USA (a soccer team located in California) and Bank of America. Together these organizations created the program "Educate to Activate" which provides free financial education for the Californian Latino community.

The theory most often associated with CSR is stakeholder theory (Freeman, 1984). Freeman defined a stakeholder as "any group or individual who can affect or is affected by the achievement of the organization's objectives" (p. 46). Carroll (1991) suggested a natural fit between CSR ideals and an organization's stakeholders, as the stakeholder concept delineates the specific groups that organizations should consider when implementing CSR initiatives (Quinn, 2002). Based on Freeman's definition of stakeholders, Mitchell, Agle and Wood (1997) presented a stakeholder identification theory with three attributes: legitimacy, urgency, and power. Mitchell and colleagues theorized that these attributes affect the degree to which managers prioritize stakeholders' needs and interests. However, according to institutional theory, the degree of priority that managers assign to different stakeholders also depends on how other organizations in the same industry operate in relation to these groups (Campbell, 2007).

Although employees are a powerful stakeholder group, few studies have examined the impact of CSR initiatives on employees. Consequently, researchers such as Peterson (2004), Brammer, Millington, & Rayton (2007), and Ellis (2008) have proposed furthering the theoretical and empirical examination of the relationship between CSR initiatives and employees' behaviors (e.g., OCBs), attitudes (e.g., commitment, identification), and perceptions of corporate image. Thus, following these researchers' suggestion, this paper attempts to further the theoretical understanding of CSR and its potential impact on employees' attitudes and behaviors.

CSR can be defined as a "process by which an organization expresses and develops its 'corporate culture' and social consciousness" (Rupp, Ganapathi, Aguilera & Williams, 2006, p. 537). This social consciousness appears when organizations engage in social activities that go beyond their financial interests and what is required by law (McWilliams & Siegel, 2001). Rupp et al. (2006) suggested that organizational acts of responsibility or irresponsibility impact employees' attitudes and behaviors. Consequently, they added, "employees' perceptions of CSR will trigger emotional, attitudinal, and behavioral responses" (p. 539). CSR initiatives can positively impact stakeholders' perceptions of the organization as CSR can generate a positive effect on consumers' commitment to different products or services (Cohen & Greenfield, 1997). For instance, individuals might be more likely to commit to buy products from companies that implement environmentally-friendly policies than from others that do not. Furthermore, CSR initiatives can also have a positive influence on employees' perceptions of the organization, which can lead to organizational identification (Turker, 2009) as well as organizational commitment (Peterson, 2004).

Organizational Identification

Organizational identification has an important place in the study of organizational behavior because researchers have found that employees' identification level is one of the variables that impact overall organizational effectiveness (Ashforth & Mael, 1989). However, until the late 1980s, organizational identification was not fully understood and researchers utilized organizational identification as a synonym of other related constructs such as organizational commitment (Ashforth & Mael).

Ashforth and Mael (1989) undertook the task of re-conceptualizing the construct and explained that social identity theory (SIT) could easily restore the coherence of organizational identification and its applications to organizational behavior. SIT posits that individuals tend to classify themselves into various social categories or social groups such as religious affiliation, gender, and/or sport teams (Tajfel & Turner, 1985). Based on this assumption, Ashforth and Mael suggested that organizational identification "is a specific form of social identification where the individual defines him or herself in terms of their membership in a particular organization" (p. 105). The organizational identification framework developed by them is now widely accepted. By using SIT as a premise for organizational identification, Ashforth and Mael were able to provide a concise definition and clarify the applicability of this construct.

A number of studies of organizational commitment and organizational identification have attempted to establish differences between the constructs. Although these constructs have been defined differently, many researchers such as Cheney (1983), Bergami and Bagozzi (2000),

Fuller, Barnett, Hester and Relyea (2003), and Gautam, VanDick and Wagner (2004) believed they are related. Some have proposed that organizational identification precedes organizational commitment, while others have argued the contrary. Fuller et al. (2003) stated that only employees who identify with the organization remain loyal to it. Allen and Meyer (1990) added that if a person feels that other organizations provide similar work experiences, their current work experiences may have little or no impact on organizational commitment, especially on affective commitment. Mir, Mir and Mosca (2002) suggested that organizations should endeavor to include human resources practices that may lead to affective commitment, because younger employees are highly committed to their careers and may therefore never feel obligated to or a need to remain with a specific organization.

The proposed study builds on the literature reviewed above and proposes that employees may exhibit different levels of psychological connection to the organization. These levels of connection are characterized by a level of identification (or lack thereof). An employee is said to be identified with an organization when she/he believes that his/her values and goals are similar to those of the organization (Kelman, 1958; Angle & Perry, 1981; O'Reilly & Chatman, 1986;). Employees who identify with the organization develop an emotional bond with it. As this bond becomes stronger, the employee internalizes organizational goals and values, and defines him/herself in terms of the organization. The researchers propose that the different levels of organizational identification are related to the different types of organizational commitment proposed by Allen and Meyer (1990): affective, continuance, and normative commitment. This relationship will be further explained later in this paper.

Organizational Commitment

The study of organizational commitment is filled with contradictory perspectives. For instance, Kanter (1968) was the first to propose different dimensions of organizational commitment: a) continuance commitment—commitment based on opportunity cost of leaving the organization, b) cohesion commitment—person's attachment to the social relationships at work, c) control commitment—attachment to norms and self-conceptions of system values. However, researchers such as Porter, Steers, and Mowday (1974) disagreed with Kanter and stated that organizational commitment is a unidimensional construct. Oliver (1990) argued that organizational commitment is not a psychological construct but a group of behavioral patterns characterized by an engagement with an organization that restricts freedom of action.

Regardless of the number of contradictory perspectives about organizational commitment found in the literature, the majority of researchers agree that commitment is a multidimensional psychological construct. Although a number of scholars have proposed conceptual models and measurement scales that reflect this approach, a unique theory of organizational commitment does not exist. However, the three-component model (TCM) developed by Allen and Meyer (1990) is one of the most widely used.

The TCM suggests that the three dimensions of organizational commitment are affective, continuance, and normative commitment. According to Allen and Meyer (1990), affectively committed employees remain with the organization because they *want* to do so. These employees demonstrate psychological commitment to the organization "through feelings, such as loyalty,

affection, warmth, belongingness, fondness, happiness, pleasure, and so on" (Jaros, Jermier, Koehler, & Sincich, 1993, p. 954). Continuance commitment, on the other hand, is based on opportunity-cost ideas or/and perceive lack of alternatives. For instance, an employee may know that by leaving her current job for a different one, she might be able to work fewer hours; however, she knows that she would lose her health insurance and pension benefits. In other words, employees who develop continuance commitment basically remain with the organization because the costs of leaving are too high (e.g., loss of seniority, health insurance plan, pension benefits, etc.). Their commitment is based on membership instead of on an emotional attachment to the organization. Consequently, "even after the individual decides to continue with the organization, that individual may not put any extra effort for the benefit of the organization" (Chelladurai, 1999, p. 250). Finally, employees whose primary link to the organization is through a sense of obligation (i.e., "the right thing to do") remain with the organization because they *ought* to do so (Meyer & Allen, 1991). Jaros et al. (1993) explained the concept of normative commitment by stating that,

> …this form of commitment differs from affective commitment because it reflects a sense of duty, an obligation, or calling, to work in the organization, but not necessarily emotional attachment. It differs from continuance commitment because it does not necessarily fluctuate with personal calculation of inducements or sunk costs (p. 955).

In the complete conceptual model (see Figure 1), the TCM provides the underlying framework for the commitment construct. The decision to utilize this framework is based on two reasons: there is strong empirical evidence supporting it (e.g., Allen & Meyer, 1990; 1996; Meyer & Allen, 1991; and Meyer, Stanley, Herscovitch & Topolnytsky, 2002) and it also seems more reasonable to think of organizational commitment as a multidimensional construct as the TCM captures common elements found throughout the commitment-related literature from the 1950s to 1980s (e.g., attachment to the organization, internalization of societal norms, perceived lack of opportunities, among others). The following figure depicts the proposed relationships between the aforementioned constructs.
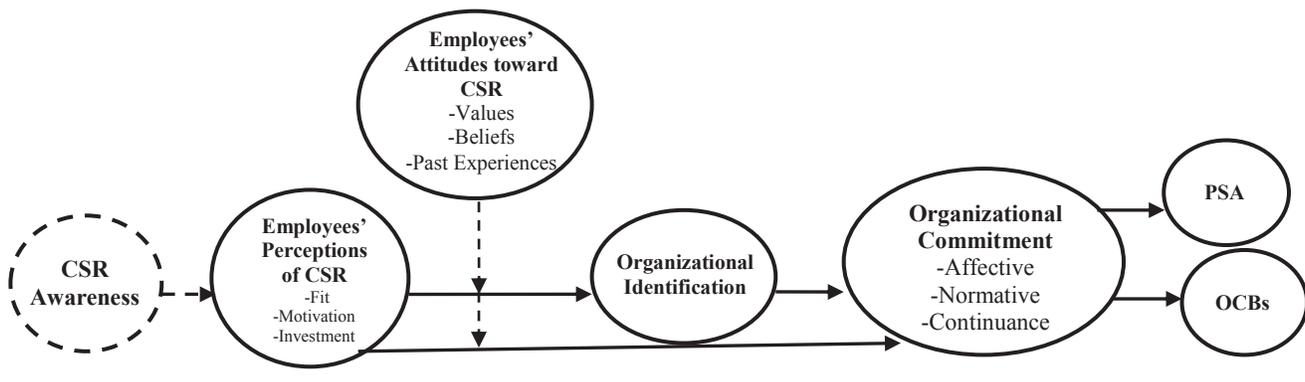
FIGURE 1. PROPOSED CONCEPTUAL MODEL

CONCEPTUAL MODEL

CSR Awareness

First, the primary condition that needs to occur prior to examining the impact of employees' perceptions of CSR on organizational identification is awareness. According to Pickens (2009), awareness can play an important role in the perception process. Awareness of CSR initiatives can lead to the development of a bilateral psychological contract between the employees and the organization (Ellis, 2008; Morrison & Robinson, 1997), as well as a decrease in employees' skepticism about the organization's motivation for engaging in CSR. Although employees' awareness of CSR initiatives is as important as the initiatives themselves (Ellis), organizations tend to overlook the process of communicating their efforts to be socially responsible. In this study, awareness functions as a boundary condition. That is, for the proposed conceptual model to be supported (see Figure 1), employees should be aware of the CSR initiatives that their employer organization is engaged in.

Employees' Perceptions of CSR and Organizational Identification

Researchers such as Rupp et al. (2006) suggested that employees' perceptions of CSR can trigger emotional, attitudinal, and behavioral responses that are beneficial to the organization. For instance, CSR initiatives can have positive impact on employees performance (Hickman, Lawrence & Ward, 2005), commitment (Peterson, 2004), satisfaction (Devinney, 2009), and identification (Kim, Lee, Lee & Kim, 2010). However to some extent, researchers have overlooked the indicators that comprised those employees' perceptions or the concept of perceptions has been operationalized as a behavioral variable (e.g., Kim et al). In this paper, it is proposed that employees' perceptions of CSR are comprised of three indicators: perceptions of CSR motivation, perceptions of CSR fit, and perceptions of CSR investment. These indicators were drawn from the literature as explained below.

When organizations engage in CSR initiatives, employees expect the organization to have beneficent motives and be committed to a valued social cause (Handelman, 2006; Turker, 2009). In return, employees will also support the cause even if it involves some sacrifice on their part (Thompson & Bunderson, 2003). In the proposed model, motivation is related to the perceived organizational motives for engaging in CSR initiatives. Morgan and Hunt's (1994) trust-commitment theory, explains that trust is generated from substantial communication and shared values between organizations and their stakeholders. These define trust as a sense of confidence in an exchange partner's reliability and integrity. Thus, if employees trust in the reliability and integrity of CSR initiatives, such initiatives can have a positive influence on employees' perceptions regarding an organization's motives for engaging in CSR initiatives. If employees' perceive CSR initiatives as sincere efforts to help society, such perceptions can evolve into feelings of sympathy toward the organization which can later develop into sentiments of identification with the organization and an attitude of commitment to their work. This might change if employees perceive such initiatives to be efforts only to gain publicity or to improve organizational image.

Employees and other stakeholders do question the reasons behind organizations' CSR initiatives, and are generally skeptical of the sincerity of organizations' CSR motives (Bhattacharya & Sen, 2004). Bhattacharya and Sen considered that two factors impacting consumers CSR skepticism are the organization's reputation and the fit between the organization and the social cause that it supports. For example, the authors explained that consumers are generally skeptical when organizations are involved in CSR initiatives that are closely related to their line of business (e.g., Phillip's Morris and its campaign against childhood smoking). Thus, trust plays an important role in stakeholders' perceptions of CSR initiatives. Employees may become antipathetic towards organizations' CSR activities if they suspect ulterior motives behind such initiatives (e.g., increase sales, generate publicity) (Haley, 1996; Menon & Khan, 2003). If employees and other stakeholders perceive ulterior motives behind an organization's CSR initiatives, the organization can lose its credibility and severely damage its reputation. When CSR initiatives are perceived as sincere efforts for supporting a social cause, employees are more likely to believe that the motivation for engaging in CSR efforts is the actual message that is being conveyed (e.g., we care about the community) (Goldsmith, Lafferty, & Newell, 2000) and such perception can trigger an emotional response in the form of identification.

Organizations seek to create and maintain a positive reputation because it helps them to attract and retain good employees (Turban & Greening, 1996). Although there is evidence suggesting that CSR initiatives can create a good organizational reputation, organizations must be able to demonstrate beneficent motives behind their CSR efforts. One way of doing this is to engage in CSR initiatives congruent with the organizational mission statement and/or organizational values (Cohen & Greenfield, 1997; Porter & Kramer, 2006). In other words, it is important that employees perceive a fit between the organization and its CSR efforts.

In this paper, fit is related to the perceived congruence between the organization and its CSR initiatives. Researchers such as Burke and Logsdon (1996) and Porter and Kramer (2002; 2006) suggested that CSR initiatives should be strategically related to the organization's mission, values, and objectives. Social issues that are highly related to the organization's mission, values, and objectives should receive priority. This concept is also known as centrality (Burke & Logsdon, 1996). CSR initiatives that have high centrality (i.e., high fit) are considered to yield major benefits to the organization in comparison to those initiatives that have low centrality (Burke & Logsdon).

Basil and Herr (2003; 2006) conducted various empirical studies and found that when consumers perceive there is a fit between the organization and the charities that it supports, their attitude toward the organization is more positive than when they perceive that there is not a good fit. Bhattacharya and Sen (2004) also found that when stakeholders perceive a high fit between the organization and the social causes that it supports, they are more likely to develop a sentimental bond with the organization. Likewise, studies conducted by Lafferty, Goldsmith and Hult (2004) found that when consumers perceive that CSR efforts are congruent with the organization's image, they are more likely to perceive those efforts as positive and truthful. Specifically, perceived fit strengthens the relationship that consumers have with an organization (Basil & Herr, 2006) and at the same time has a positive impact on consumers' behavior (e.g., patronage intentions).

Similar to the consumer research mentioned above, Cohen and Greenfield (1997) argued that employees are more likely to support organizational CSR initiatives perceived to be consistent with the organization's mission and values. For instance, Ben & Jerry's teaches its employees the importance of environmentally sustainable business practices. Thus, several of their CSR initiatives are oriented toward programs dealing with this issue. It is important for organizations to engage in CSR initiatives that have high centrality (Burke & Logsdon, 1996). That is, their CSR initiatives should be congruent with their mission, values, and objectives. When stakeholders perceive CSR initiatives to be congruent with the organization's mission, values, and objectives, they are more likely to perceive those initiatives as legitimate (i.e., truthful), to have a positive attitude toward the organization, and to develop a sentimental bond with it (Basil & Herr, 2003; 2006; Bhattacharya & Sen, 2004; Lafferty et al., 2004).

In the proposed model investment is related to the perceived amount of resources (i.e., effort, time, and money) that an organization spends on its CSR initiatives. To our knowledge, the construct perceived investment has not been used in the CSR literature. However, in other fields of study such as marketing (Schlosser, White & Lloyd, 2006), sport management (Kim, Smith & James, 2010), communication (Goei & Boster, 2005), and social psychology (Algoe, Haidt & Gable, 2008) perceived investment has been used as an antecedent of gratitude. Tesser, Gatewood, and Driver (1968) explained that gratitude and perceived motivation are a function of the recipient's perceptions of the intention of the benefactor, the cost to the benefactor in providing the benefit, and the value of the benefit. Thus, gratitude and perceptions of motivation become more positive when investment is perceived to be greater.

Signaling theory can be used to explain the construct of perceived investment. Signaling theory has been used in the management literature to suggest that through their recruitment tactics, organizations send potential employees information in the form of signals or cues about the organizations' working conditions (e.g., Spence, 1974; Turban & Greening, 1996). Marketing researchers also utilize this theory to explain how marketing practitioners commonly use observable signals such as price, warranties, and promotions to communicate to the consumers unobservable qualities of a product (e.g., quality and value) (Kirmani & Rao, 2000; Schlosser et al., 2006). Signals can be defined as the actions that convey an organization's abilities and intentions (Porter, 1980). The amount of resources (e.g., time and money) that organizations spend on their socially responsible initiatives can convey signals to employees that may represent how much the organization really cares about such initiatives. In other words, through the amount of time and money that the organization spends on CSR, the organization is sending signals to its employees about the importance of CSR for the organization. At the same time those signals would impact employees' perceptions of the organization's CSR initiatives.

When organizations engage in socially responsible behaviors (i.e., CSR initiatives), employees look at signals such as time, money, and effort that their employer invests towards the CSR initiatives and make inferences about their employer's reasons for engaging in CSR. For instance, if employees perceive that the organization invests a low amount of resources in their CSR initiatives (e.g., not enough money and effort), they might perceive that the organization does not really care about the social causes it purports to support. On the contrary, if the amount of resources invested in CSR is perceived to be high, employees might then perceive that the organization does care about the social causes that it supports.

Employees' Attitudes toward CSR, Perceptions of CSR, and Organizational Identification

Researchers (Eagly & Chaiken, 1998; Bohner & Wanke, 2002) interested in the study of attitudes suggested the possibility that individuals' attitudes introduce a cognitive bias into their information processing. According to Pratkanis (1989), attitudes function as a cognitive schema that affects individuals' information processing. When processing information, individuals' schema will affect their expectations about an object, facilitate encoding of information, and will guide inferences that go beyond the information given about a particular object or situation (Bohner & Wanke, 2002). In other words, attitudes—in the form of a cognitive schema—will influence individuals' perceptions and interpretation of particular situations they face. Individuals' perceptions are closely related to their attitudes (Bohner & Wanke, 2002). Perceptions are defined by Lindsay and Norman (1977 as cited by Pickens, 2009) as "the process by which organisms interpret and organize to produce a meaningful experience of the world" (p. 52). That is, when individuals are confronted with a situation or other stimuli, they interpret it into something that is meaningful to them (Pickens, 2009). However, variables such as individuals' past experiences and especially individuals' attitudes will shape how individuals' perceive and interpret the situation. Consequently, individuals' perceptions and/or interpretations may be very different from reality (Pickens, 2009).

In the organizational context, employees' attitudes toward CSR can influence their perceptions of CSR initiatives. For example, employees who tend to have a negative attitude toward CSR initiatives may tend to perceive them as "firm-serving" efforts rather than "society-serving" efforts. When employees perceive CSR initiatives as firm-serving efforts, they perceive that through CSR initiatives their employer organization is simply pursuing its own self-interest (e.g., increase media exposure) (Webb & Mohr, 1998). Contrarily, if employees perceive CSR initiatives as society-serving, they perceive that the organization is genuinely motivated to support a social cause without seeking any return (Webb & Mohr). In terms of investment, employees who have a negative attitude toward CSR may perceive CSR initiatives as a waste of time and money. Conversely, employees who have a positive attitude toward CSR may perceive their organization's socially responsible efforts to be altruistic efforts to aid the local community. Or even they might think that the organization does not invest sufficient resources into CSR programs.

Researchers (e.g., Sims, 2003; Maignan & Ferrell, 2004; Einwiller, Fedorikhin, Johnson & Kamins, 2006) suggested that there exists a positive relationship between CSR and stakeholders' identification. The researchers argued that stakeholders will be more likely to identify with organizations that are considered socially responsible rather than with those that are not because, as Cohen and Greenfield (1997) suggested, when an organization is socially responsible "people want to buy from you. They want to work for you. They want to be associated with you. They feel invested in your success" (p. 29). In this paper, however, it is proposed that stakeholders' (i.e., employees) attitudes toward CSR initiatives play an important role in stakeholder identification. The reasoning for this proposition is explained below.

Attitudes are believed to be enduring evaluative dispositions toward an object (Chisman, 1976). Since CSR initiatives can be considered an object, employees will more likely have evaluative dispositions (i.e., attitudes) toward such initiatives. Different factors such as the values and

beliefs that employees grew up with or their past experiences may influence their attitude toward CSR initiatives. For example, Bogler (1994) suggested that past experiences have a strong effect on future attitudes. Consider an employee who worked for an organization whose CSR initiatives were clearly based on ulterior motives. There is a chance that this employee would likely be more cynical towards the CSR efforts of future employer organizations. Similarly, if this employee worked for an organization that was perceived to have society-serving motives, the employee's attitude toward CSR might be positive, based on this past experience.

Researchers in the area of consumer behavior also found that consumers' attitudes toward CSR affect consumers' reactions to organizations' socially responsible or irresponsible behaviors. For instance, in Maignan et al.'s (1999) study, a great percentage of consumers (approximately 88%) stated that they believe that businesses should be socially responsible and that they are more likely to consume product and services from organizations that are socially responsible. Similarly, Mohr and Webb (2005) found that consumers, who believe in and appreciate CSR, tend to evaluate more positively those organizations that engage in environmental CSR initiatives. Maignan and Ferrell (2004) stated that when organizations engage in different social issues they are acknowledging the importance of such issues. Stakeholders who share similar concerns for those issues "are likely to appreciate the organization's initiatives, and a feeling of bonding to the firm may emerge" (Maignan & Ferrell, p. 14). Hence, consumers who care about the environment will be likely to develop an emotional bond with organizations that engage in environmental CSR initiatives (c.f., Mohr & Webb, 2005). Similarly, when employees value and have a positive attitude toward CSR and their employer organization engages in CSR initiatives, such initiatives are likely to play an important role in creating an emotional bond between employees and their employer organization. In other words, CSR can play an important role in developing employees' organizational identification.

Organizational Identification and Organizational Commitment

The relationship between organizational identification and organizational commitment proposed in this paper is based on the TCM. The researchers propose a partially mediated model in which the level of identification with the organization impacts organizational commitment differently. For example, an employee may continue her/his employment with an organization because the costs of leaving are too high or because she/he does not want to lose the "rewards" she/he currently receives from the organization (e.g., competitive benefit packages, reasonable salary) (O'Reilly & Chatman, 1986). This does not imply, however, that the employee is emotionally attached (i.e., identified) with the organization. The employee may decide to remain with the organization because the costs of leaving are too high even though her/his level of organizational identification is possibly low.

Not all employees would remain with an organization because the costs of leaving are too high or because they perceive a lack of alternatives; others will remain with the organization because they may tend to behave in a way they think society expects them to. For instance, if an employee has a stable job with a reasonable salary and fringe benefits, she/he may believe that people important to her/him (e.g., family members and friends) expect her/him to stay with the organization, even if she/he is not happy with the job. Although this employee does not identify

with the organization, she/he develops a sense of obligation toward it, and feels that staying with the organization is the right thing to do (i.e., normative commitment).

Lastly, the relationship between identification and affective commitment is characterized by an emotional bond between the employee and the organization (Bergami & Bagozzi, 2000) that leads her/him to want to stay with the organization. Identification occurs "when an individual accepts influence because he wants to establish or maintain a satisfying self-defining relationship to another person or group" (Kelman, 1958, p. 53). Employees might perceive that their values are similar to the organizational values, so they want to maintain the relationship with the organization because the organization becomes a part of their identity. The relationship between identification and affective commitment is important because it has been suggested that organizations will be able to reduce employees' turnover only through the development of a sentimental bond (Mir et al., 2002).

Organizational Citizenship Behaviors and Personal Social Action

The conceptual model proposed in this paper also includes two outcome variables that derive from employees' organizational commitment: organizational citizenship behaviors (OCBs) and personal social action (PSA). The first outcome variable we will discuss is OCBs.

OCBs are defined as "individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and in the aggregate promotes the efficient and effective functioning of the organization" (Organ, Podsakoff, & MacKenzie, 2006, p. 3). According to this definition, although OCBs are important to the effective functioning of an organization, such behaviors are not formally rewarded within the organization. OCBs are not included in job descriptions; therefore, it is the employees' personal choice to engage or not to engage in OCBs (Organ et al, 2006). Empirical evidence supporting the relationship between organizational commitment and OCBs has been contradictory. For instance, such as Meyer et al. (1993) and Shore and Wayne (1993) found organizational commitment to be a predictor of this type of behavior, whereas William and Anderson (1991) did not find any relationship at all. Wagner and Rush (2000) suggested that engagement in OCBs is not related to employees' organizational commitment but related to their age. In this article, however, it is proposed that when employees are committed to the organization, they will behave in a way that is congruent with the organization's objectives (Barney & Stewart, 2000). Therefore, if the organization promotes a cooperative environment among its employees, employees will more likely be cooperative. If the organization engages in socially responsible behavior and promotes this type of behavior among the employees, then the employees will likely behave in the same manner.

Commitment can also have a positive effect on employees' PSA. This construct was proposed by Ellis (2008) and she defined it as "individual actions supported by and/or sponsored by the organization to support a social good" (p. 29). Ellis explained that PSA includes such actions as charitable donations automatically deducted from employees' paychecks, paid time off to volunteer, and special activities in support of charitable organizations and/or issues of social interest (e.g., cancer awareness, environmental-related issues). In other words, social activities that are created to benefit a particular group of people or the community as a whole and which "under favorable circumstances, produce actual empowerment, impact or social change"

(Horvath, 1999, p. 221). PSA does not include CSR activities undertaken by the organization that "have no employee involvement such as community grants, donations, corporate-wide sustainability programs, and in-kind donations" (Ellis, 2008, p. 29).

PSA differs from OCBs, because OCBs, as aforementioned, are discretionary (i.e., extra-role) behaviors that are not formally recognized and/or rewarded within an organization. Conversely, PSA is sponsored and promoted by the organization and employees are generally encouraged to participate in such activities (Ellis, 2008). Unlike OCBs, PSA does not improve the organization's efficiency and effectiveness and more importantly, they are targeted to external individuals or groups (Ellis). Furthermore, Ellis asserted that since PSA can be considered a specific type of prosocial behavior, it is easier to conceptualize and measure the types of behaviors constituting PSA.

DISCUSSION

Although organizations are now developing more CSR programs in which employees are encouraged to participate, only a few studies have examined the impact that such programs have on employees' identification and commitment. The proposed model (see Figure 1) addresses this gap. Specifically, through the proposed model the researchers attempt to explain the potential impact that employees' perceptions of CSR initiatives may have on identification and commitment.

The primary condition that needs to occur prior to examining the impact of employees' perceptions of CSR on organizational identification is awareness. Sometimes organizations devote a lot of money into their CSR initiatives but they tend to forget to communicate that to their employees (c.f., Cohen & Greenfield, 1997). It is imperative that organizations communicate their socially responsible efforts to their employees because awareness of CSR initiatives can lead to the development of a bilateral psychological contract between the employees and the organization, and to a decrease in employees' skepticism about the organization's motivation for engaging in CSR (Morrison & Robinson, 1997; Ellis, 2008; Kim et al., 2010). Practitioners can use internal communication channels such as internal newsletters, emails, bulletin boards to communicate their CSR initiatives. This way employees awareness of CSR initiatives will likely increased.

As mentioned previously, the variable, employees' perceptions of CSR initiatives, is operationalized using three indicators: perceived CSR motivation, perceived CSR fit, and perceived CSR investment. In terms of perceived motivation, it is suggested that a feeling of trust toward the organization is generated when employees' perceive that substantial information is given to them about the CSR initiatives that the organization is engaged in. Because CSR efforts tend to increase following negative media exposure (Werbel & Wortman, 2000), employees may become skeptical about the sincerity of the organization for engaging in CSR. (Bhattacharya & Sen, 2004). Thus, organizations need to consider how their employees perceive their CSR efforts. When CSR initiatives are perceived as sincere efforts for supporting a social cause, employees are more likely to believe that the motivation for engaging in CSR initiatives is the actual message that is being conveyed (e.g., we care about the community) (Goldsmith et al.,

2000) and such perception can trigger an emotional response in the form of identification and commitment.

In terms of fit, it is important for organizations to consider CSR initiatives that are congruent with their mission and objectives, because when employees perceive that there exists a congruency between the organization and its CSR initiatives, they will be more likely to perceive such initiatives as sincere efforts to aid society, to develop a sentimental bond with the organization, and to be highly committed to their jobs (e.g., Basil & Herr, 2003; 2006; Bhattacharya & Sen, 2004; Lafferty et al., 2004, Peterson, 2004). In terms of perceived investment, employees look at signals such as time, money, and effort that their employer invests towards CSR initiatives and make inferences about their employer's reasons for engaging in CSR. From an external evaluation perspective, it is now common for organizations to be evaluated not only based on their financial performance but on their social performance as well (Sims, 2003). The amount of money spent on socially responsible initiatives is considered when assessing the social performance of organizations (Sims). Organizations that perform well financially and socially are considered to be socially valuable (Sims), and as Turban and Greening (1996) suggested: employees tend to find it gratifying to be part of an organization that is socially valuable. These sentiments of gratification can lead to higher levels of identification and commitment.

As observed in the proposed conceptual model, employees' attitudes toward CSR can influence their perceptions of CSR initiatives. For example, employees who tend to have a negative attitude toward CSR initiatives may tend to perceive them as "firm-serving" efforts rather than sincere efforts to help society. In terms of investment, employees may perceive CSR initiatives as a waste of time and money. Conversely, employees who have a positive attitude toward CSR may perceive their organization's CSR efforts to be altruistic efforts intended to help the local community. Because of their positive attitude toward CSR, it is also possible they might think the organization does not invest sufficient resources on CSR programs. In terms of organizational identification and commitment, it can be argued that the influence of employees' perceptions on identification and commitment might change according to their attitude (positive or negative) toward CSR initiatives. Changing employees' attitudes toward CSR might be a challenging task for practitioners. However, through clear communication of the organization's mission, objectives, and the reasons for engaging in CSR, practitioners might be able to persuade employees and to have them "on-board" in their CSR initiatives. If the organization promotes a cooperative environment among its employees, employees will more likely be cooperative. If the organization engages in social responsible behavior and promotes this type of behavior among the employees, then the employees will likely behave in the same manner.

The conceptual model presented in this paper also attempts to further the understanding of the relationship between organizational identification and commitment. It is presumed that employees who identify with the organization demonstrate a higher level of organizational commitment, and are more likely to remain with the organization because they have developed an emotional attachment to it. When employees find that their values are not congruent with those of the organization, their level of identification is more likely to be negatively affected (Bhattacharya, Rao & Glynn, 1995) and their level of commitment changes. For example, instead of remaining with the organization because they want to (i.e. emotional attachment),

employees will be more likely to stay out of an obligation (i.e. normative commitment) or sense of need (i.e. continuance commitment). This notion is very important to the study of organizational commitment because employees committed for calculative reasons (i.e. continuance commitment) or who are normatively committed are considered to be at higher risk of turnover and absenteeism (Blau & Boal, 1989). It is also presumed that highly committed employees are more likely to engage in OCBs as well as PSAs. Both of these behaviors are important because although OCBs are discretionary and not explicitly rewarded, they support the efficient and effective functioning of organizations (Organ et al., 2006). In addition, employees' participation in PSAs is important because they can contribute to the success of social initiatives sponsored by the organization (Ellis, 2008).

Finally, like any other scholarly paper, this paper is not without limitations. One limitation is that the directionality and causality of the constructs is not unquestionable. For instance, it can be argued that if an individual work for an organization that engages in CSR and she/he values and have a positive attitude toward CSR, CSR initiatives are likely to play an important role in creating an emotional connection between the employee and the organization. This relationship, however, can also be reversed. Namely, when employees have a close emotional tie with their organization, they can also view CSR in a positive manner. Therefore, the directionality of the constructs should be further examined in future research.

Directions for Future Research

In the conceptual model is proposed that employees' perceptions of CSR have a positive impact on organizational identification and commitment. However, all the relationships presented in this paper should be empirically tested. It is also important to consider the inclusion of other moderating variables, such as employees' needs. According to content theories (i.e., need-based theories), different contents (e.g., the work environment) motivate employees to engage in specific behaviors (Chelladurai, 1999). Therefore, if organizational factors or actions (e.g. CSR initiatives) satisfy employees' needs, employees will be more likely to commit to the organization as well as engage in OCBs and PSAs. Future research could investigate the moderating effect of employees' needs between perceptions of CSR, organizational identification, and commitment.

Future research can also consider including other workplace variables that may impact employees' perceptions of CSR. For example, Ben & Jerry's rewards employees for their efforts to collaborate in the company's CSR initiatives (Cohen & Greenfield, 1997). However, other organizations do not do the same. Therefore, employees' perception of and involvement in CSR may be affected by the organization's reward system in relation to employees' CSR involvement. Furthermore, employees' involvement in the organization's CSR initiatives could also be affected by their self-interest, which means that they can see that the money invested in CSR is money that it should be invested in them (i.e., employees). This "dual" role of CSR needs further examination.

Studies conducted in the future should also test if the proposed relationships vary across industries. For example, sport organizations seem to receive greater attention by the media and general public. Consequently, CSR may be a stronger predictor of organizational identification

and commitment among individuals working for sport organizations than individuals working in other industries. Future empirical studies should collect two or more samples composed of individuals working in different industries. Conducting such comparisons will establish empirical evidence supporting whether organizational phenomena can be explained by the same causes or if it varies by organizational context (Hantrais, 1995).

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AN ANALYSIS OF RETAIL MORTGAGE PAYMENT BEHAVIOR
BASED ON HIDDEN MARKOV MODELS

Chang Liu, Southern West University of Finance and Economics, China

Morsheda Hassan, Wiley College
mthassan@wileyc.edu

Raja Nassar, Louisiana Tech University
Nassar@coes.latech.edu

ABSTRACT

This paper is concerned with stochastic modeling of retail mortgage loans using hidden Markov chains (HMC). HMC are very useful in determining the unobservable variables affecting retail mortgage loans by analyzing the observable state transition behaviors of the loans. A fourth-order HMC model is presented based on the assumption that the past several periods of payment behavior have an effect on current behavior. Also, an Interactive Hidden Markov chain model is presented in order to capture the interaction between the observable states, loan transition behavior, and the unobservable underlying local macro-economic factors.

INTRODUCTION

Not all important variables affecting a process under consideration are directly observable. In such a case, a model that considers only the observable variables is often not efficient and may lead to wrong conclusions. A case in point is the modeling of credit risk.

In the modeling of credit risk, the payment behavior may be influenced by economic factors. Furthermore, in areas such as small local communities, the influence may also run in the opposite direction. This can occur if the payment behavior affects the local economy by changing the local credit environment, and thus employment, interest rate, and production.

In this paper, the effects of hidden or unobservable macroeconomic factors on the mortgage payment behavior are studied by Hidden Markov Chains. Also, a higher-order HMC (HHMC) is used to account for multiple transition lags. Furthermore, an Interactive HHMC model is used to analyze the two-way effect between the mortgage payment behavior and the local macroeconomy by using data from a local community bank.

LITERATURE REVIEW

The basic property of a Markov chain has been extended to accommodate many new applications among them are network traffic analysis, speech recognition, DNA sequence analysis, engineering designs, and inventory management. Also, new theories extending the basic Markov assumption have been developed in the past 50 years, such as High-order Markov chains, Multivariate Markov chains, and Hidden Markov chains.

Hidden Markov Chains

Although higher-order Markov chain models may provide more accurate results than first-order Markov chains, they fail to take into consideration underlying forces that may influence observed transition processes in real-world problems. Examples include speech recognition, stock market analysis, and network traffic analysis. All these problems could be solved by Hidden Markov chain models. A standard HMC model has the following elements:

(1) Hidden states, $H = \{H_1, H_2, ..., H_N\}$

(2) Observable states, $S = \{S_1, S_2, ..., S_l\}$

(3) Transition probability distribution within hidden states,
$A = \{a_{ij}\}, a_{ij} = P(H_{j,t=n} | H_{i,t=n-1}), 1 \leq i, j \leq N$

(4) Emission probabilities matrix, $B = \{b_{jk}\}$ where $b_{jk} = P(S_k | H_j), 1 \leq j \leq N, 1 \leq k \leq l$

(5) Initial state distribution, $\Pi = \{\pi_i\}, \pi_i = P(S_i), 1 \leq i \leq N$.

Thus, an HMC is completely specified by: $\Lambda = (A, B, \Pi)$. As pointed out by MacDonald and Zucchini (1997), HMC could be used to answer the following three classic problems:

(1) Given an observed sequence $S = \{S_1, S_2, ..., S_l\}$ and a model $\Lambda = (A, B, \Pi)$, how does one efficiently compute $B = \{b_{jk}\}$,

(2) Given an observed sequence $S = \{S_1, S_2, ..., S_l\}$ and a model $\Lambda = (A, B, \Pi)$, how do we choose the corresponding state sequence $A = \{a_{ij}\}$ which best explains the observations,

(3) How does one adjust the model parameters $\Lambda = (A, B, \Pi)$ to maximize $P(S / \lambda)$.

Thomas, Allen, and Kingsbury (1998) used a hidden Markov chain model for the term structure and credit risk spreads of bond prices. Their model had two dependent factors, interest rate and the credit rating of the bonds which were affected by the underlying macroeconomic factors assumed to be the unobserved hidden processes. A linear programming approach was used to solve the model and the coupon strip, assuming that there was no miss-pricing opportunity.

Also, algorithms to estimate the parameters of a hidden Markov chain have been studied by Archera and Titterington (2002). They proposed some alternatives to maximum likelihood estimates (MLE), such as EM algorithm, Zhang's mean-field approximation to the EM algorithm, and Monte Carlo simulations. Parameter estimates has been studied by Arribas-Gil, Gassiat, and Matias (2006) in pair hidden Markov models by simulation, Hobolth and Jensen (2005) for DNA

Sequences, and Knudsen and Miyamoto (2003) for Human alpha and beta-hemoglobin sequences. Many algorithms are used to efficiently solve these problems, including a forward algorithm, a backward algorithm, an EM algorithm, and a heuristic linear programming method for a higher-order HMC proposed by Ching and Ng (2006). This linear programming method is as follows:

$$(1) \qquad Min_{\lambda_i} \left\{ \left\| \sum_{j=1}^{k} \lambda_j V_j \hat{H}_i - \hat{H}_i \right\|_l \right\}, i = 1, 2,$$

$$\text{Subject to} \sum_{i=1}^{k} \lambda_i = 1, \lambda_i \geq 0$$

Where the λ_i's are the parameters, $\hat{H}_i$ is the estimated stationary probability distribution, and V_j is the higher-order transition matrix defined as A at the beginning of this subsection.

Comparisons between the EM algorithm and the linear programming method (LPM) for different orders, provided by Ching and Ng (2006), are also presented in Tables 1 and 2.

TABLE 1. COMPARISON BETWEEN THE EM ALGORITHM AND LPM BY NUMBER OF ITERATIONS

	First-Order	**Second-Order**	**Third-Order**
Linear Programming	1381	1378	1381
EM Algorithm	1377	1375	1377

TABLE 2. COMPARISONS BETWEEN THE EM ALGORITHM AND LPM BY COMPUTATION TIME IN SECONDS

	First-Order	**Second-Order**	**Third-Order**
Linear Programming	1.16	1.98	5.05
EM Algorithm	4.02	12.88	40.15

It is seen from these tables that although there is not much difference between linear programming and the EM algorithm with regard to the number of iterations, the linear programming method is better than the EM algorithm regarding computation time, especially for a higher order. Similar approaches have also been used by Ching and Ng (2004) for parameter estimates, Ching, Ng and Fund (2003) for DNA sequence, and Ching, Ng Fund, and Siu T (2005) for a categorical data sequence.

MODELS

The ultimate purpose of the HMC is to better understand and predict the transition probabilities between the observable states by analyzing the underlying forces that have influence on the observable behavior. Generally speaking, what people are really interested in are the observable states. However, to better simulate or estimate the true pattern of the state transition under different prevailing underlying situations, underlying forces must be taken into account in the model. Empirically speaking, as more information is built into the model, more accurate results could be expected, which is the general idea of the higher-order HMC. From the linear programming scheme proposed by Raftery (1985), which was extended by Ching and Ng (2006) by allowing for non-stationary transition intensity ($Q_i, i = 1, 2, ..., T$) overtime, one can avoid the problem of having to estimate too many parameters in a higher-order Markov model. In addition, the higher-order model could be further improved by assuming that the observable states could also have influences on the unobservable or hidden states. As a result, an HMC will allow for the interaction between these two types of states and might produce even more accurate prediction results.

In the Markov chain model, let S_j be a state of past due corresponding to the days of past due. The loan normally requires monthly payment. Based on monthly payments, Table 3 defines the different states of the Markov chain representing mortgage loan payments. According to the Basel accord II, Basel Committee on Banking Supervision (1997), the definition of default is more than 90 days past due, which is represented by S_3. However, there have been cases where the obligations on a loan, which have already been more than 90 days past due, has been paid off. As a result, the definition of default is modified to be the state of default that is triggered by a permanent force, such as death or an application of chapter 7 or chapter 13 bankruptcy protections.

Referring to Table 3, Let R_k be the default state and let S_{-j} be the state of a prepaid period defined as $S_{-j} = (X_i - Y_i)/Y_i$, where X_i is the actual payment at month i and Y_i is the scheduled payment at month i. One can see that state S_{-j} is defined as the extra payment over the scheduled payment, which measures how many future monthly payments have been made.

For example, if a loan monthly payment (or scheduled amount) is $1500 and the payment for that month is $6000, then the loan is three months prepaid (6000-1500)/1500 = 3) and the state is S₋₂. Likewise, a past due state is obtained as (due amount – scheduled amount) / scheduled amount. Furthermore, if a loan's prepayment is less than 50% of the remaining balance, the loan stays in the S states and is classified according to the rules above. If a loan is prepaid more than 50% and less than 75% of its remaining balance, then it belongs to R3. When the prepayment is 75% or more, the loan is in state R4.

TABLE 3. DEFINITIONS OF THE DIFFERENT STATE OF THE MARKOV CHAIN WITH REGARD TO PAYMENTS ON A MORTGAGE LOAN

Past Due and Prepayment States $S_j, j = -3, -2, -1, 0, 1, 2, 3$		Default States R_k $R_k, k = 1, 2, 3, 4$	
S_{-3}	Prepaid More than 91 days	R_1	Sold by Bank
S_{-2}	Prepaid 61 days – 90 days	R_2	All others
S_{-1}	Prepaid 31 days – 60 days	R_3	Prepayment is more than 50% and less than 75% of the remaining balance
S_0	No more than 30 days past due	R_4	Prepayment is 75% or more of the remaining balance
S_1	31 days – 60 days past due		
S_2	61 days – 90 days past due		
S_3	More than 91 days past due		

Hidden Markov chain model

In most cases, an observable phenomenon is veiled by invisible forces. In this case, these hidden forces are crucial to understanding the perceivable pattern. In this subsection, a simple Hidden Markov Model is introduced to track and predict the transition probabilities of payment states in retail mortgage loans by taking local macroeconomic situations into consideration. The macro-economic environment is the main factor influencing business development. It is desirable to have a measurement which could track hidden macroeconomic transition processes that have a close relationship with the financial industry. One good candidate is the state space model concerning the business industry industrial production index by Liu et al. (2007). The model is given as:

$$(2) \quad y_t = 0.4096 y_{t-2} + 0.0835 Ir_{t-2} - 0.6258 Un_{t-2} - 0.0619 In_{t-2} - 0.0236 Dp_{t-2}$$
$$-0.987529 Ir_{t-1} + 0.26377 In_{t-1} + 0.002143 Dp_{t-1}$$

where, y_t is the industrial production index at time t, Ir_t is interest rate, Un_t is unemployment, In_t is inflation, and Dp_t is disposable personal income at time lags. We define an economic environment to be positive if the industrial production index is at least 100 at that period and negative otherwise. Thus, we have 2 hidden states. From time to time, the hidden state transits from good to bad or from bad to good. Without loss of generality, we assume that the probability of the industrial production index being positive is α, and the probability of it being negative is $1-\alpha$. Also, we follow the definition of observable retail mortgage states in Table 3. By the definition of hidden states, we can observe the steady state probability distribution (under

different hidden states), $O_{i,S}^t, i = 1, 2, \ S \in (S_j, R_k), j = -3, -2, -1, 0, 1, 2, 3; k = 1,2,3,4,$ which are defined as:

$$(3) \quad O_{i,S}^t = \begin{cases} O_{1,S}^t, & \text{if observed under a positive economic environment at time } t \\ \\ O_{2,S}^t, & \text{if observed under a negative economic environment at time } t \end{cases}$$

A new method for estimating the parameter α has been introduced by Ching and Ng (2006). Following their method, one needs to define a probability distribution at steady state. Unfortunately, in a dynamic economic environment, a steady state does not exist. One way we can bypass this dilemma is as follows: Let X_S be the Sth element of the steady state probability distribution vector X, $S \in (S_j, R_k), j = -3, -2, -1, 0, 1, 2, 3, k = 1, 2, 3, 4$ in terms of an average value, X_S can be expressed as:

$$(4) \quad X_S = \frac{\sum_{i=1}^{2} \sum_{t=1}^{n} O_{i,S}^t}{n}, S \in (S_j, R_k), j = -3, -2, -1, 0, 1, 2, 3, k = 1, 2, 3, 4, n = 16$$

Thus, the steady state probability distribution is approximated by averaging all the observed distributions over the intersections, where n is the number of switches (or transitions from positive economy to negative economy) in the available time series data. Thus, to estimate α in the hidden Markov chain, we use Equation (5) as suggested by Ching and Ng (2006). Equation (5) minimizes the sum of squared deviations between $\hat{P}_S$ and X_S.

$$(5) \quad \begin{aligned} & Min_{0 \le \alpha \le 1} \{\psi\} = \{\|\hat{P}_S - X_S\|_2\} \\ & S \in (S_i, R_k), i = -3, -2, -1, 0, 1, 2, 3, k = 1, 2, 3, 4 \end{aligned}$$

$\hat{P}_S$ is given by the following matrix manipulation. Let P be so defined such that

$$(6) \quad P = \begin{pmatrix} 0 & H_{2\times11} \\ P'_{11\times2} & 0 \end{pmatrix}_{13\times13}$$

where, $H_{2\times11} = \begin{pmatrix} \alpha & \cdots & \alpha \\ 1-\alpha & \cdots & 1-\alpha \end{pmatrix}_{2\times11}$, and $P'_{11\times2} = \begin{pmatrix} O_{S|1}^T & O_{S|2}^T \end{pmatrix}_{11\times2}$.

$O_{S|i}^T, i = 1, 2, \ S \in (S_i, R_k), i = -3, -2, -1, 0, 1, 2, 3, k = 1, 2, 3, 4$. Thus,

$$(7) \quad P^2 = \begin{pmatrix} 0 & H_{2\times11} \\ P'_{11\times2} & 0 \end{pmatrix} \times \begin{pmatrix} 0 & H_{2\times11} \\ P'_{11\times2} & 0 \end{pmatrix} = \begin{pmatrix} H_{2\times11} \times P'_{11\times2} & 0 \\ 0 & P'_{11\times2} \times H_{2\times11} \end{pmatrix}_{13\times13}$$

Therefore, $\hat{P}_S$, the probability distribution taking hidden states into consideration with α known, is defined as:

$$(8) \quad \hat{P}_S = P'_{11\times2} \times H_{2\times11} \times 1_{11\times1},$$

where $1_{1x11} = (1,1,...,1)^T$

Based on the assumption that $\hat{P}_S$ is a stationary probability distribution, we can build a Markov prediction model to approximate the probability distribution in the next period under the consideration of a hidden process. The model is given as:

$$(9) \quad \begin{cases} Min_\lambda\{\psi\} = \{\left\|\lambda V_S \hat{P}_S^t - \hat{P}_S^{t+}\right\|_l\}, l = 1,2,\infty \\ \text{subject to } \lambda > 0 \\ S \in (S_i, R_k), i = -3,-2,-1,0,1,2,3, k = 1,2,3,4 \end{cases}$$

where V_S is the transition intensities. Once we find the parameter λ, we can use the probability distribution observed at time $t-1$ to predict that at time t. A higher-order Markov prediction model for hidden processes will be presented in the next subsection.

Heuristic Method for the Higher-Order HMC (HHMC)

Given observed states, a higher-order HMC can be used to address the following three problems: (1) prediction of the probability distribution of observed states $P(O|\Lambda), \Lambda = (A, B, \Pi)$, (2) determining the optimal hidden states that best explain the observed behaviors, and (3) estimating the model parameters, $\Lambda = (A, B, \Pi)$. In the real economic world, we seldom have the capability to choose underlying factors affecting the observable behavior of a process. Thus, problem (2) is irrelevant to our case. To solve problems (1) and (3) by conventional methods require tedious recursive algorithms such as the forward algorithm for problem (1), and the EM algorithm for problem (3). Detailed discussion of the forward and EM algorithms could be found in MacDonald and Zucchini (1997).

In this subsection, we will present a Heuristic method proposed by Ching and Ng (2006) for a fourth-order HMC based on the assumption that the emission probabilities matrix, $B = \{b_{S|j}\}$, where $b_{jk} = P(S_k|H_j), 1 \le j \le N, 1 \le k \le i$ could be observed, which is generally the case. Let $\{\hat{h}_i\} \in \hat{H}, i = 1,2$ be the stationary probability distribution for the hidden states, and $\{\hat{v}_{i,t}\} \in \hat{V}_t, t = 1,2,3,4, i = 1,2$ be the transition intensities between the hidden states with different time lags. An equation for estimating λ_i in a fourth-order hidden Markov model is given as:

$$(10) \qquad Min_{\lambda_i} \left\{ \left\| \sum_{j=1}^{k} \lambda_j \hat{V}_k \hat{H} - \hat{H}_i \right\|_l \right\}, i = 1, 2, k = 1, 2, 3, 4,$$

$$\text{subject to } \sum_{i=1}^{k} \lambda_i = 1, \lambda_i \geq 0$$

For practical reasons, we choose $l = 1$ in the vector norm $\| \|_l$. Thus, the more applicable version of Equation (10) that could be solved by the Excel **Solve()** function is:

$$(11) \qquad Min_\lambda \sum_{l=1}^{4} w_l, \text{subject to}$$

$$\begin{cases} \begin{pmatrix} w_1 \\ w_2 \\ \cdots \\ w_i \end{pmatrix} \geq H - [V_1 H \, | \, V_2 H \ldots | \, V_k H] \begin{pmatrix} \lambda_1 \\ \lambda_2 \\ \cdots \\ \lambda_k \end{pmatrix} \\ \\ \begin{pmatrix} w_1 \\ w_2 \\ \cdots \\ w_i \end{pmatrix} \leq H + [V_1 H \, | \, V_2 H \ldots | \, V_k H] \begin{pmatrix} \lambda_1 \\ \lambda_2 \\ \cdots \\ \lambda_k \end{pmatrix} \end{cases}$$

Here, $\hat{H}_i$, the hidden stationary probability distribution, must be approximated since it cannot be observed directly. Ching and Ng (2006) proposed a method to calculate $\hat{H}_i$ from the observed probability distribution, $O_{i,S}$:

$$(12) \qquad \begin{array}{l} \left\| \hat{O}_{i,S} - B\hat{H}_i \right\|_l , l = 1, 2, \infty, i = 1, 2 \\ S \in (S_j, R_k), j = -3, -2, -1, 0, 1, 2, 3, k = 1, 2, 3, 4 \end{array},$$

where B is the emission probability matrix, $B = \{b_{S|i}\}$, $b_{S|i} = P(S_S | H_i), i = 1, 2$, and $\hat{O}_S$ is the observed probability distribution. For the accuracy of the model, we choose $l = 2$ and Equation (12) given in matrix form becomes:

$$(13) \qquad Min \left\| \{o_{i,S}\}_{11 \times 1} - \{b_{S|i}\}_{11 \times 2} \{h_i\}_{2 \times 1} \right\|_2 , i = 1, 2$$
$$S \in (S_j, R_k), j = -3, -2, -1, 0, 1, 2, 3, k = 1, 2, 3, 4$$

Also, in need of estimation are the transition intensities among the hidden states, $\{\hat{v}_{i,t}\} \in \hat{V}_t, t = 1, 2, 3, 4, i = 1, 2$. As pointed by Ching and Ng (2006), $\hat{H}_i$, the hidden stationary probability distribution estimated by Equation (13) could be used to estimate the first-order transition intensity matrix for hidden states:

$$\hat{H}_{2\times 1} = \begin{pmatrix} \hat{h}_1 \\ \hat{h}_2 \end{pmatrix} \Rightarrow \hat{V}_1 = \begin{pmatrix} \hat{h}_1 & \hat{h}_2 \\ \hat{h}_2 & \hat{h}_1 \end{pmatrix}$$

Thus, as the transition intensity matrix is assumed to be stationary, the second, third, and fourth order could be estimated by the following procedure:

$$(14) \quad \begin{aligned} \hat{V}_2 &= \hat{V}_1 \times \hat{V}_1, \\ \hat{V}_3 &= \hat{V}_1 \times \hat{V}_1 \times \hat{V}_1, \\ \hat{V}_4 &= \hat{V}_1 \times \hat{V}_1 \times \hat{V}_1 \times \hat{V}_1, \end{aligned}$$

As such, the above estimation provides us a stable method to approximate different orders of transition intensities.

The following is a summary of the above steps for a higher-order HMC:

Step 1: Use Equation (12) to find the stationary probability distribution for the hidden states, where $b_{S|i}$ is the emission transition from hidden states to observed states given by $b_{S|i} = P(S_{i,k} \mid H_i), i = 1, 2$;

Step 2: find the transition intensities for various orders by Equation (14); and

Step 3: Use Equation (13) to estimate model parameters $\lambda_i, i = 1, 2, 3, 4$ for a fourth-order HMC.

An Interactive Higher-Order Hidden Markov Model (IHHMC)

The interactive HMC is different from the regular HMC in the sense that hidden states of an interactive HMC are affected by previous hidden states and by observable states. In case of retail mortgage analysis, not only local macro-economic factors can affect the mortgage payments, but the payment behavior also determine the collection policy deployed by the banks such as high mortgage rate to cover the foreseeable credit risks of the unusual payment patterns, which, in turn, affect the local businesses in many ways. Therefore, an interactive higher-order HMC seems to be a good candidate for capturing the mechanism in this system. Let $O_{S,i}$ be the observed probability distributions under different hidden states such that:

$$(15) \quad O_{S,i} = \begin{cases} O_{S,1}, & \text{if observed under a positive economic environment} \\ \\ O_{S,2}, & \text{if observed under a negative economic environment} \end{cases}$$

We define $\alpha_S, S \in (S_i, R_k), i = -3, -2, -1, 0, 1, 2, 3, k = 1, 2, 3, 4$ to be the probability of the hidden state being positive, given the observable states in S. Thus, the transition matrix is given as:

$$(16) \quad P = \left(\begin{array}{c|c} 0 & O_{2\times 11} \\ \hline A_{11\times 2} & 0 \end{array} \right)_{13\times 13}, A_{11\times 2} = \{a_{i,s}\}$$

where, $A = \begin{pmatrix} \alpha_1 & \cdots & \alpha_{11} \\ 1-\alpha_1 & \cdots & 1-\alpha_{11} \end{pmatrix}^T, O = \begin{pmatrix} 0_{1,1} & \cdots & 0_{1,11} \\ 0_{2,1} & \cdots & 0_{2,11} \end{pmatrix} S \in (S_i, R_k), i = -3, -2, -1, 0, 1,$

$$2, 3, k = 1, 2, 3, 4. \text{ Thus,}$$

$$P^2 = \begin{pmatrix} 0 & O_{2\times 11} \\ A_{11\times 2} & 0 \end{pmatrix} \times \begin{pmatrix} 0 & O_{2\times 11} \\ A_{11\times 2} & 0 \end{pmatrix}$$

$$(17) \qquad = \begin{pmatrix} O_{2\times 11} \times A_{11\times 2} & 0 \\ 0 & \hat{P}_S \end{pmatrix}_{13\times 13}$$

$$= \begin{pmatrix} O_{2\times 11} \times A_{11\times 2} & 0 \\ 0 & A_{11\times 2} \times O_{2\times 11} \end{pmatrix}_{13\times 13}$$

where, $\hat{P}_S$ the probability distribution under hidden states, is defined as

$$(18) \qquad \hat{P}_S = A_{11\times 2} \times O_{2\times 11} \times 1_{11\times 1},$$

$$\text{where } 1_{11\times 1} = (1, 1, ..., 1)^T.$$

To estimate the parameters α_S, we need the steady state one-step transition probability matrix which could be approximated by $\tilde{P}_{1\times 11} = \{\tilde{p}_S\}_{11\times 11}, S \in (S_i, R_k), i = -3, -2, -1,$ $0, 1, 2, 3, k = 1, 2, 3, 4$. Letting $c_{ik}, i = -3, -2, -1, 0, 1, 2, 4, k = 1, 2, 3, 4$ be the transition frequency between state i and state k, the calculation of $\tilde{p}_S$ is given as:

$$(19) \qquad C_{ik} = \begin{pmatrix} c_{-3,-3} & \cdots & c_{-3,4} \\ \vdots & \ddots & \vdots \\ c_{4,-3} & \cdots & c_{4,-3} \end{pmatrix}_{11\times 11} \quad \tilde{P}_S = \begin{pmatrix} \tilde{p}_{-3,-3} & \cdots & \tilde{p}_{-3,4} \\ \vdots & \ddots & \vdots \\ \tilde{p}_{4,-3} & \cdots & \tilde{p}_{4,-3} \end{pmatrix}_{11\times 11}$$

$$\tilde{p}_{i,k} = \begin{cases} \dfrac{c_{i,k}}{\displaystyle\sum_{i=S_{-3}}^{R_4} c_{i,k}}, & \text{if } \displaystyle\sum_{i=S_{-3}}^{R_4} c_{i,k} \neq 0 \\[4mm] 0, & \text{Otherwise} \end{cases}$$

We define the Frobenius norm as $\|A_{n\times n}\|_F^2 = \sum_{j=1}^{n}\sum_{i=1}^{n} A_{ij}^2$. Thus, the parameters α_S could be approximated by minimizing the Frobenius norm given as:

(20) $\quad Min_{\alpha_i} \left\| \hat{P}_S - \tilde{P}_S \right\|_F^2$

Therefore, the above minimizing algorithm could also be expressed as:

(21)
$$
\begin{aligned}
&(1)\alpha_1 : Min_{0\le\alpha_1\le1}\{(\tilde{p}_{-3,-3} - \hat{p}_{-3,-3})^2 + \ldots + (\tilde{p}_{-3,4} - \hat{p}_{-3,4})^2\}; \\
&(2)\alpha_2 : Min_{0\le\alpha_2\le1}\{(\tilde{p}_{-2,-3} - \hat{p}_{-2,-3})^2 + \ldots + (\tilde{p}_{-2,4} - \hat{p}_{-2,4})^2\}; \\
&\vdots \qquad\qquad\qquad \vdots \qquad\qquad\qquad \vdots \\
&(11)\alpha_{11} : Min_{0\le\alpha_{11}\le1}\{(\tilde{p}_{4,-3} - \hat{p}_{4,-3})^2 + \ldots + (\tilde{p}_{4,4} - \hat{p}_{4,4})^2\};
\end{aligned}
$$

The equation to estimate λ_i in a fourth order hidden Markov model is given as

(22) $\quad Min_{\lambda_i} \left\{ \left\| \sum_{j=1}^{k} \lambda_j V_j \hat{P}_S - \hat{P}_S \right\|_{l} \right\}, i = 1,2,$

subject to $\sum_{i=1}^{k} \lambda_i = 1, \lambda_i \ge 0$,

where $\hat{P}_S$, the hidden stationary probability distribution, is given by Equation (18). Finally, the transition intensities among hidden states could be estimated by exactly the same idea of Equation (14). The only difference is the fact that the transition intensities are 11×11 matrices to capture the effects between observed processes and hidden processes. Thus, from Ching and Ng (2006), the higher-order interactive transition intensities can be calculated as follows:

Let $\{\hat{p}_S\} \in \hat{P}_S$, $S \in (S_i, R_k), i = -3, -2, -1, 0, 1, 2, 3, k = 1, 2, 3, 4$:

(23)
$$
\hat{V}_1 = \begin{pmatrix}
\hat{p}_{-3} & \hat{p}_{-2} & \cdots & \hat{p}_4 \\
\hat{p}_{-2} & \hat{p}_{-3} & \hat{p}_4 & \vdots \\
\vdots & \hat{p}_4 & \ddots & \hat{p}_{-2} \\
\hat{p}_4 & \cdots & \hat{p}_{-2} & \hat{p}_{-3}
\end{pmatrix}_{11\times11}
$$
$$
\hat{V}_2 = \hat{V}_1 \times \hat{V}_1,
$$
$$
\hat{V}_3 = \hat{V}_1 \times \hat{V}_1 \times \hat{V}_1,
$$
$$
\hat{V}_4 = \hat{V}_1 \times \hat{V}_1 \times \hat{V}_1 \times \hat{V}_1,
$$

The whole algorithm for an Interactive Higher-Order HMC is as follows:

Step 1: Use Equation (21) to find the stationary probability distribution for hidden states, where $b_{S|i}$ is the emission transition from hidden states to observed states given by:

$b_{S|i} = P(S_{i,k} | H_i), i = 1, 2, S \in (S_i, R_k), i = -3, -2, -1, 0, 1, 2, 3, k = 1, 2, 3, 4$

Step 2: determine the transition intensities by Equation (23); and

Step 3: Use Equation (22) to estimate model parameters $\lambda_i, i = 1, 2, 3, 4$ for a fourth-order HMC.

APPLICATIONS

A bank, providing the retail mortgage services, never operates in a vacuum because the transitions of its mortgage payment behavior and its credit asset quality are affected by many macroeconomic factors. In general, the transition pattern of the mortgage payment behavior varies under different macro-economic environments which, in turn, are presented by a group of indices or factors. HMCs, however, could provide a way to unveil more accurate transition processes and therefore provides a probability distribution for mortgage payment states closer to the real prevailing macro-economic situation.

In this section, 18 consecutive months of monthly paid retail mortgage data, provided by an Ohio local bank, will be analyzed by the hidden Markov model. This includes the basic first-order HMC given in Equation (9), a higher-order HMC given in Equation (11), and finally, an interactive HMC in Equation (21).

The computations performed in this paper are accurate and are not affected by round-off error. The Solver procedure in Excel can do calculations up to 8 digits in accuracy. Also, Matlab accuracy is up to 26 digits in Floating point computation.

HMC for Unobservable Factors in Retail Mortgages

In this section, a basic first-order HMC is used to analyze and predict the probability distribution among states considering the effects of underlying macro-economic factors. Due to the lack of an industrial production index in the local Ohio area where the bank data were obtained, we estimated the index from Equation (2) by using macro-economic data for Ohio from February 2005 to September 2006. The macro-economic data for Ohio from Feb 2005 to Sep 2006 are presented in Table 4.

TABLE 4. MACRO-ECONOMIC DATA AND INDEX FOR OHIO

Year Month	Un	Ir	In	Dp	Index
2005 02	5.78	5.93	3.52	5.23	11.53
2005 03	5.80	5.87	4.20	5.08	12.20
.					
.					
.					
2006 07	5.80	6.76	5.47	2.50	16.64
2006 08	5.40	6.52	2.99	2.10	13.94
2006 09	5.00	6.40	5.74	2.10	15.10

In this Table, Ir is interest rate, Un is unemployment, In is inflation, Dp is disposable personal income at different times. For the purpose of this analysis, we refer to the industrial production index from the model in Equation (2) as the macro-economic situation in Ohio. The hidden Markov index sequence is presented in Figure 1.

The average index from Table 4 is 14.023. If we let a year takes a value of 1 or 0 depending on whether the index for that year is larger or smaller than 14.023, respectively, we obtain the hidden transition sequence in Table 5.
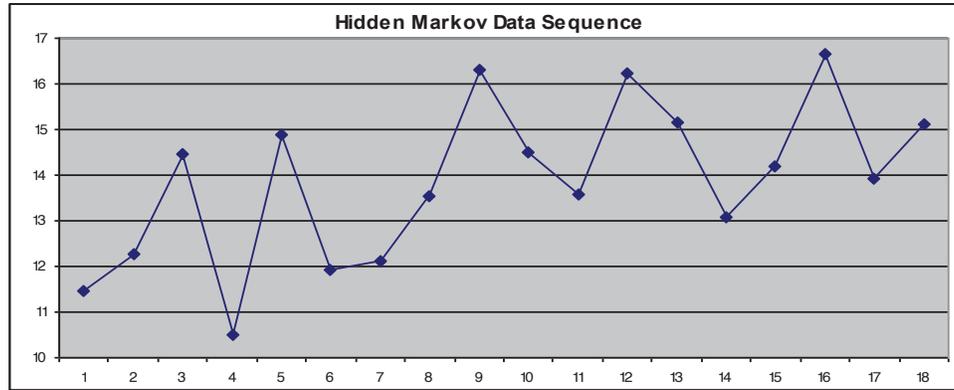
FIGURE 1. HIDDEN MARKOV DATA SEQUENCE

Table 5. Hidden transition sequence:

$$t: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16$$

$$H_t: 0, 0, 1, 0, 1, 0, 0, 0, 1, 1, 0, 1, 1, 0, 1, 1, 0$$

From the data sequence in Table 5, one can estimate the emission probability matrix, $B = \{b_{S|j}\}$. We define the steady state probability distribution for the positive hidden states (1's in Table 5)

as: $O_{S|1} = \dfrac{\sum_t o_S}{8}, t = 3,5,9,10,12,13,15,16$. Similarly, the steady state probability distribution for

negative (0's) hidden states as: $O_{S|2} = \dfrac{\sum_t o_S}{9}$, $t = 1,2,4, 6,7,8,11,14,17$. From MathCAD, we

obtained the probability distribution as shown in Table 5.

TABLE 5. STEADY STATE PROBABILITY DISTRIBUTIONS

$$O_{S|1} = \begin{pmatrix} 0.0052 & 0.0094 & 0.0578 & 0.9452 & 0.0547 & 0.0412 & 0.0224 & 0.0001 & 0.0378 & 0.0028 & 0.0014 \end{pmatrix}^T$$

$$O_{S|2} = \begin{pmatrix} 0.0021 & 0.0023 & 0.0098 & 0.7380 & 0.0531 & 0.1078 & 0.0009 & 0.0300 & 0.0424 & 0.0015 & 0.0021 \end{pmatrix}^T$$

$$X_S = \begin{pmatrix} 0.0038 & 0.0087 & 0.0187 & 0.8012 & 0.0947 & 0.0094 & 0.0145 & 0.0300 & 0.0147 & 0.0024 & 0.0019 \end{pmatrix}^T$$

where X_S is given by Equation (4). We let $H_{2\times11} = \begin{pmatrix} \alpha & \dots & \alpha \\ 1-\alpha & \dots & 1-\alpha \end{pmatrix}_{2\times11}$ and

$P'_{11\times2} = \begin{pmatrix} O_{S|1}^T & O_{S|2}^T \end{pmatrix}_{11\times2}, O_{S,i}^T, i=1,2$. Here, α is the probability of the hidden state being positive and $1-\alpha$ the probability of being negative. Thus, the parameter α, could be calculated by Equation (5) or the following algorithm by letting $l = 2$:

$$(24) \quad \begin{cases} Min_{\alpha} \{\sum_{S}(\hat{P}_S - X_S)^2\} \\ subject \text{ to } 0 \le \alpha \le 1 \end{cases}$$

where $\hat{P}_S$ is given by: $\hat{P}_S = (0.0073\alpha + 0.0021 \quad 0.0117\alpha + 0.0023 \quad ... \quad 0.0035\alpha + 0.0021)_{1\times11}^T$

By the Excel **Solver()** function, we estimate α to be 0.9143, which means that 91.43% of the time between Apr 2005 to Sep 2006 the macro-economic environment would stay in a positive state. As a result, the estimated probability distribution affected by the hidden macro-economic factors is given as:

$$\hat{P}_S = (0.0045 \quad 0.0083 \quad 0.0520 \quad 0.8010 \quad 0.0455 \quad 0.0284 \quad 0.0204 \quad 0.00248 \quad 0.0031 \quad 0.0021 \quad 0.0011)_{1\times11}^T$$

In the next section, we will apply a Higher-order HMC to the retail mortgage data.

A Higher-Order HMC

In this section, we will use a higher-order HMC to track and predict the hidden transition process. We approximate the steady state hidden probability distribution by a modified version of Equation (13) that could be solved directly by the Excel **Solver()**. This gives:

$$(25) \quad \begin{cases} Min_{h_i} \{\sum_{S}(\{o_S\}_{11\times1} - \{b_{S|i}\}_{11\times2}\{h_i\}_{2\times1})^2\}, i = 1,2 \\ subject \text{ to } 0 \le h_i \le 1, \sum_{i=1}^{2} h_i = 1 \\ S \in (S_i, R_k), i = -3, -2, -1, 0, 1, 2, 3, k = 1, 2, 3, 4 \end{cases}$$

where $\{b_{S|i}\} \in B_{S|i}$, the emission probabilities, represent the probability distribution vectors under hidden states 1 and 2, respectively. These are given in Table 6.

TABLE 6. INPUT VARIABLES FOR EQUATION (13)

$$b_{S|1} = (0.0052 \quad 0.0094 \quad 0.0578 \quad 0.9452 \quad 0.0547 \quad 0.0412 \quad 0.0224 \quad 0.0001 \quad 0.0378 \quad 0.0028 \quad 0.0014)^T$$
$$b_{S|2} = (0.0021 \quad 0.0023 \quad 0.0098 \quad 0.7380 \quad 0.0531 \quad 0.1078 \quad 0.0009 \quad 0.0300 \quad 0.0424 \quad 0.0015 \quad 0.0021)^T$$
$$O_S = (0.0038 \quad 0.0087 \quad 0.0187 \quad 0.8012 \quad 0.0947 \quad 0.0094 \quad 0.0145 \quad 0.0300 \quad 0.0147 \quad 0.0024 \quad 0.0019)^T$$

From the solution to Equation (25) we have $\hat{H} = \{\hat{h}_1, \hat{h}_2\} = \{0.4033, 0.5967\}$

In the next step, we will approximate the transition intensities for different orders by Equation (23). Note that the first-order transition intensity matrix is given by:

$$\hat{H}_{2\times1} = \begin{pmatrix} \hat{h}_1 \\ \hat{h}_2 \end{pmatrix} \Rightarrow \hat{V}_1 = \begin{pmatrix} \hat{h}_1 & \hat{h}_2 \\ \hat{h}_2 & \hat{h}_1 \end{pmatrix}.$$ Thus, the transition intensities for four orders are estimated from

MathCAD to give:

$$(26) \quad \begin{aligned} \hat{V}_1 &= \begin{pmatrix} 0.4033 & 0.5967 \\ 0.5967 & 0.4033 \end{pmatrix} & \hat{V}_2 &= \begin{pmatrix} 0.5187 & 0.4813 \\ 0.4813 & 0.5187 \end{pmatrix} \\ \hat{V}_3 &= \begin{pmatrix} 0.5007 & 0.4993 \\ 0.4993 & 0.5007 \end{pmatrix} & \hat{V}_4 &= \begin{pmatrix} 0.4964 & 0.5036 \\ 0.5036 & 0.4964 \end{pmatrix} \end{aligned}$$

The method to estimate the parameters $\lambda_i, i = 1,2,3,4$ for is given by Equation (11). The linear programming scheme is as follows:

$$\hat{H} = \begin{pmatrix} 0.4033 & 0.5967 \end{pmatrix}^T$$
$$V_1\hat{H} = \begin{pmatrix} 0.5187 & 0.4813 \end{pmatrix}^T$$
$$V_2\hat{H} = \begin{pmatrix} 0.4964 & 0.5036 \end{pmatrix}^T$$
$$V_3\hat{H} = \begin{pmatrix} 0.5007 & 0.4993 \end{pmatrix}^T$$
$$V_4\hat{H} = \begin{pmatrix} 0.4999 & 0.5001 \end{pmatrix}^T$$

Subject to:
$$\begin{cases} Min_{\lambda_1,\lambda_2,\lambda_3,\lambda_4}(w_1 + w_2 + w_3 + w_4) \\ \\ w_1 \geq 0.4033 - 0.5187\lambda_1 - 0.4964\lambda_2 - 0.5007\lambda_3 - 0.4999\lambda_4 \\ w_2 \geq 0.5967 - 0.4813\lambda_1 - 0.5036\lambda_2 - 0.4993\lambda_3 - 0.5001\lambda_4 \\ w_1 \geq -0.4033 + 0.5187\lambda_1 + 0.4964\lambda_2 + 0.5007\lambda_3 + 0.4999\lambda_4 \\ w_2 \geq -0.5967 + 0.4813\lambda_1 + 0.5036\lambda_2 + 0.4993\lambda_3 + 0.5001\lambda_4 \\ w_1, w_2, w_3, w_4 \geq 0, \\ \lambda_1 + \lambda_2 + \lambda_3 + \lambda_4 = 1, \lambda_1, \lambda_2, \lambda_3, \lambda_4 \geq 0 \end{cases}$$

Applying the above scheme to the Excel **Solver()**, the parameters for the higher-order Markov chain model are given by $\lambda = \begin{pmatrix} 0.1876 & 0.8125 & 0 & 0 \end{pmatrix}$. As a result, the HHMC is given as

$$(27) \quad \hat{H}_{t+1} = 0.1876V_1\hat{H}_t + 0.8125V_2\hat{H}_{t-1}$$

Equation (27) implies that the probability distribution of the hidden states at $t = n+1$ are dependent on only those at $t = n$ and at $t = n-1$.

Interactive Effects Analysis for Retail Mortgages

The observable probability distributions, $O_{2\times11}$, under both positive and negative states, are given as:

$$(28) \quad O_S = \begin{pmatrix} 0.0052 & 0.0094 & 0.0578 & 0.9452 & 0.0547 & 0.0412 & 0.0224 & 0.0001 & 0.0378 & 0.0028 & 0.0014 \\ 0.0021 & 0.0023 & 0.0098 & 0.7380 & 0.0531 & 0.1078 & 0.0009 & 0.0300 & 0.0424 & 0.0015 & 0.0021 \end{pmatrix}$$

Therefore, $\hat{P}_S$, the probability distribution under hidden states, is given by Equation (17) as

$$\hat{P}_S = A_{11\times2} \times O_{2\times11} 1_{11\times1}, 1_{1\times11} = (1,1,...,1)^T \text{ where } A = \begin{pmatrix} \alpha_1 & ... & \alpha_{11} \\ 1-\alpha_1 & ... & 1-\alpha_{11} \end{pmatrix}^T. \text{ Thus, } \hat{P}_S \text{ is given as}$$

$$\begin{pmatrix}
1+0.0031\alpha_1 & 1+0.0071\alpha_1 & 1+0.048\alpha_1 & 1+0.2072\alpha_1 & 1+0.0016\alpha_1 & 1-0.0666\alpha_1 & 1+0.0215\alpha_1 & 1-0.0299\alpha_1 & 1-0.0046\alpha_1 & 1+0.0013\alpha_1 & 1-0.0007\alpha_1 \\
1+0.0031\alpha_2 & 1+0.0071\alpha_2 & 1+0.048\alpha_2 & 1+0.2072\alpha_2 & 1+0.0016\alpha_2 & 1-0.0666\alpha_2 & 1+0.0215\alpha_2 & 1-0.0299\alpha_2 & 1-0.0046\alpha_2 & 1+0.0013\alpha_2 & 1-0.0007\alpha_2 \\
1+0.0031\alpha_3 & 1+0.0071\alpha_3 & 1+0.048\alpha_3 & 1+0.2072\alpha_3 & 1+0.0016\alpha_3 & 1-0.0666\alpha_3 & 1+0.0215\alpha_3 & 1-0.0299\alpha_3 & 1-0.0046\alpha_3 & 1+0.0013\alpha_3 & 1-0.0007\alpha_3 \\
1+0.0031\alpha_4 & 1+0.0071\alpha_4 & 1+0.048\alpha_4 & 1+0.2072\alpha_4 & 1+0.0016\alpha_4 & 1-0.0666\alpha_4 & 1+0.0215\alpha_4 & 1-0.0299\alpha_4 & 1-0.0046\alpha_4 & 1+0.0013\alpha_4 & 1-0.0007\alpha_4 \\
1+0.0031\alpha_5 & 1+0.0071\alpha_5 & 1+0.048\alpha_5 & 1+0.2072\alpha_5 & 1+0.0016\alpha_5 & 1-0.0666\alpha_5 & 1+0.0215\alpha_5 & 1-0.0299\alpha_5 & 1-0.0046\alpha_5 & 1+0.0013\alpha_5 & 1-0.0007\alpha_5 \\
1+0.0031\alpha_6 & 1+0.0071\alpha_6 & 1+0.048\alpha_6 & 1+0.2072\alpha_6 & 1+0.0016\alpha_6 & 1-0.0666\alpha_6 & 1+0.0215\alpha_6 & 1-0.0299\alpha_6 & 1-0.0046\alpha_6 & 1+0.0013\alpha_6 & 1-0.0007\alpha_6 \\
1+0.0031\alpha_7 & 1+0.0071\alpha_7 & 1+0.048\alpha_7 & 1+0.2072\alpha_7 & 1+0.0016\alpha_7 & 1-0.0666\alpha_7 & 1+0.0215\alpha_7 & 1-0.0299\alpha_7 & 1-0.0046\alpha_7 & 1+0.0013\alpha_7 & 1-0.0007\alpha_7 \\
1+0.0031\alpha_8 & 1+0.0071\alpha_8 & 1+0.048\alpha_8 & 1+0.2072\alpha_8 & 1+0.0016\alpha_8 & 1-0.0666\alpha_8 & 1+0.0215\alpha_8 & 1-0.0299\alpha_8 & 1-0.0046\alpha_8 & 1+0.0013\alpha_8 & 1-0.0007\alpha_8 \\
1+0.0031\alpha_9 & 1+0.0071\alpha_9 & 1+0.048\alpha_9 & 1+0.2072\alpha_9 & 1+0.0016\alpha_9 & 1-0.0666\alpha_9 & 1+0.0215\alpha_9 & 1-0.0299\alpha_9 & 1-0.0046\alpha_9 & 1+0.0013\alpha_9 & 1-0.0007\alpha_9 \\
1+0.0031\alpha_{10} & 1+0.0071\alpha_{10} & 1+0.048\alpha_{10} & 1+0.2072\alpha_{10} & 1+0.0016\alpha_{10} & 1-0.0666\alpha_{10} & 1+0.0215\alpha_{10} & 1-0.0299\alpha_{10} & 1-0.0046\alpha_{10} & 1+0.0013\alpha_{10} & 1-0.0007\alpha_{10} \\
1+0.0031\alpha_{11} & 1+0.0071\alpha_{11} & 1+0.048\alpha_{11} & 1+0.2072\alpha_{11} & 1+0.0016\alpha_{11} & 1-0.0666\alpha_{11} & 1+0.0215\alpha_{11} & 1-0.0299\alpha_{11} & 1-0.0046\alpha_{11} & 1+0.0013\alpha_{11} & 1-0.0007\alpha_{11}
\end{pmatrix}$$

Also, the observed one-step transition intensity matrix, calculated from Equation (19) is $\tilde{P}_S =$

	R_1	R_2	R_3	R_4	S_{-3}	S_{-2}	S_{-1}	S_0	S_1	S_2	S_3
R_1	1	0.	0	0	0	0	0	0	0	0	0
R_2	0	1	0	0	0	0	0	0	0	0	0
R_3	0	0	1	0	0	0	0	0	0	0	0
R_4	0	0	0	1	0	0	0	0	0	0	0
S_{-3}	0.0195	0	0	0	0.5759	0.0996	0.1646	0.1329	0	0	0
S_{-2}	0.0105	0	0	0	0.0365	0.6137	0.1563	0.1825	0.0005	0	0
S_{-1}	0.0101	0	0	0	0.02756	0.0341	0.6774	0.2399	0.0015	0	0
S_0	0.02901	0	0	0	0.0041	0.0097	0.0491	0.8920	0.0109	0	0
S_1	0.0133	0.1523	0	0.2090	0.0091	0.0089	0.0140	0.2078	0.2063	0.0552	0
S_2	0	0.0905	0.1456	0.1221	0	0.0031	0.0237	0.0347	0.0853	0.1747	0.3184
S_3	0	0.1053	0.1505	0.1305	0	0	0.0021	0.0632	0.0952	0.1510	0.2931

By the Frobenius norm defined in Equation (20), the 11 linear programming schemes are given as:

$$\begin{cases} Min_{\alpha_1}\{(1+0.0031\alpha_1-1)^2+(1+0.0071\alpha_1)^2+(1+0.2072\alpha_1)^2+...+(1-0.0007\alpha_1)^2\} \\ subject\ to:0\le\alpha_1\le1 \end{cases}$$

$$\begin{cases} Min_{\alpha_2}\{(1+0.0031\alpha_2)^2+(1+0.0071\alpha_2-1)^2+(1+0.2072\alpha_2)^2+...+(1-0.0007\alpha_2)^2\} \\ subject\ to:0\le\alpha_2\le1 \end{cases}$$

$$\vdots$$

$$\begin{cases} Min_{\alpha_{11}}\{(1+0.0031\alpha_{11})^2+(1+0.0071\alpha_{11}-0.1053)^2+(1+0.2072\alpha_{11}-0.1505)^2 \\ \qquad +...+(1-0.0007\alpha_{11}-2931)^2\} \\ subject\ to:0\le\alpha_{11}\le1 \end{cases}$$

$$\text{Letting } \hat{P}_S = \begin{cases} 0, & if\ \hat{P}\le0 \\ 1, & if\ \hat{P}\ge1 \\ \hat{p}_S, & otherwise \end{cases}$$

the probability distribution under the hidden states is given as:

$$A = \{\alpha_S\} = \begin{pmatrix} 0.0001 & 0.0001 & 0.0001 & 0.0001 & 0.0047 & 0.0004 & 0.0001 & 0.0008 & 0.0002 & 0.0008 & 0.0001 \end{pmatrix}^T$$

$$\hat{P}_S = \begin{array}{c|ccccccccccc} & R_1 & R_2 & R_3 & R_4 & S_{-3} & S_{-2} & S_{-1} & S_0 & S_1 & S_2 & S_3 \\ \hline R_1 & 1 & 0. & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ R_2 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ R_3 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ R_4 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ S_{-3} & 0 & 0 & 0 & 0 & 0.8202 & 0.1899 & 0.0324 & 0.0034 & 0 & 0 & 0 \\ S_{-2} & 0.0208 & 0 & 0 & 0 & 0.0717 & 0.8508 & 0.2881 & 0.0231 & 0.0011 & 0 & 0 \\ S_{-1} & 0.0218 & 0 & 0 & 0 & 0.0544 & 0.0671 & 0.8959 & 0.0021 & 0.0029 & 0 & 0 \\ S_0 & 0 & 0 & 0 & 0 & 0.0081 & 0.0195 & 0.0958 & 0.9883 & 0.0217 & 0 & 0 \\ S_1 & 0.3545 & 0.2814 & 0 & 0.3743 & 0.0181 & 0.0179 & 0.0279 & 0.0012 & 0.1285 & 0.1074 & 0 \\ S_2 & 0 & 0.1728 & 0.1254 & 0.0234 & 0 & 0.0064 & 0.0468 & 0.0682 & 0.1633 & 0.3189 & 0.5355 \\ S_3 & 0 & 0.1993 & 0.2784 & 0.2440 & 0 & 0 & 0 & 0.1224 & 0.1814 & 0.2793 & 0.5004 \end{array}$$

The above matrix is the transition intensities between observable states with the assumption of an interaction between the local macro-economic situation and retail mortgage payments. Because elements of the probability vector, $A = \{\alpha_S\}$, are small, we can conclude that retail mortgage payment behaviors of a single local bank have little to do with the local macroeconomic factors.

CONCLUSION

The models presented in this paper are used to further analyze the relationship between local macro-economic factors and the payment pattern for a local bank's retail mortgages. From this analysis we conclude the following:

(1) Based on a first-order HMC, the probability of stay in a positive macro-economic state is 0.9143;

(2) For the period from April 2005 to September 2006, the estimated steady state probability distribution of the hidden macro-economic states is given as

$$\hat{H} = \begin{pmatrix} \hat{h}_1 \\ \hat{h}_2 \end{pmatrix} = \begin{pmatrix} 0.4033 \\ 0.5967 \end{pmatrix} \quad ; \text{ and}$$

(3) The effect of the macro-economic states on retail mortgage loans is strong as indicated by the relatively large differences between corresponding observation $O_{S,1}$ and $O_{S,2}$ in rows 1 and 2 of the O_S matrix in Equation (28).

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BUSINESS SCHOOL FACULTY PERCEPTIONS OF CLICKERS TECHNOLOGY AND ASSESSMENT OF CLICKERS TECHNOLOGY USAGE: DOES RANK MATTER?

Kellye Jones, Clark Atlanta University
kjones@cau.edu

Amiso George, Texas Christian University
a.george2@tcu.edu

ABSTRACT

This study investigates whether perceptions of clickers technology differs by faculty rank. Additionally, course and instructor evaluations of clickers based and non-clickers courses are examined. Whether differences exist in evaluations of clickers and non-clickers courses based on faculty rank is also explored. An ANOVA analysis reveals that assistant, associate, and full professors differ in their clickers technology perceptions. Courses with clickers were evaluated more favorably, and there are faculty rank differences in course and instructor evaluations of clickers and non-clickers courses.

INTRODUCTION

The downturn in the economy has created challenges in higher education. Many U.S. colleges and universities are operating with fewer resources and tighter budgets. Subsequently, available resources are closely scrutinized in order to increase efficiencies. One area, prone to examination and change, is class size. As such, a vast number of courses are taught in large sections. This is particularly true for the core courses in a major. Tweaking core courses to accommodate large enrollments may address budget concerns but it presents a different set of challenges for both instructors and students. Instructors are often confronted with capturing and maintaining the attention of students and gauging levels of student comprehension and learning. Instructors also grapple with motivating students and facilitating engagement. For students, larger enrollments pose challenges to attendance, engagement, motivation to learn, and attention (Steinert & Snell, 1999).

Given these circumstances, many instructors are increasingly interested in reducing the challenges posed by large sections. One approach aimed at improving the classroom experience is introducing clickers technology. According to a 2010 *Chronicle of Higher Education* report, approximately 13% of faculty surveyed use clickers. Clickers technology, also known as an Audience Response System, provides instructors the opportunity to pose questions to students during a lecture and receive immediate feedback. The technology is relatively easy to use and requires an intermediate level of computer skill (Cue, 1998). Clickers technology consists of a handheld device equipped with software that transmits data to a wireless receiver that is connected to a computer. In essence,

once questions are presented to students via clicker they respond by selecting correct answers through the handheld device. Upon receipt of the answers, instructors can reveal the responses and proceed accordingly.

While clickers technology has been widely accepted (Deal, 2007), varying attitudes about the technology exist. Studies have explored student attitudes (Draper, 2002, Beekes, 2006) however, few studies investigate instructor attitudes. More specifically, little is known about Business School Faculty attitudes. This population is of particular interest and given their discipline, there should be a heightened sensitivity to innovation, recognizing the need for and embracing change, and the significance of responding to stakeholder needs.

Increased awareness of instructor attitudes is also important given the ranking scheme within academic institutions which typically demonstrates a generational hierarchy. In their investigation of university faculty and technology use, Xu and Meyer (2007) report that age was a significant factor related to faculty technology use. Assessing instructor attitudes would yield additional information and provide useful insights regarding technology teaching strategies. Differential attitudes about clickers technology may be due, in part, to one's exposure to and comfort with technology in general. In fact, studies reveal that both exposure to and attitudes toward technology are shaped by generational values (Stone, 2010).

The focus of this study is to examine instructor perceptions of clickers technology and whether differences based on instructor rank exist. Course and instructor evaluations of clickers and non-clickers courses are also explored. Whether differences in evaluations exist based on instructor rank is another area of investigation. First, the study discusses generations and technology use. Next, business school faculty characteristics are provided. Third, implementing clickers technology is covered. Fourth, the motivations for clickers use are examined. Fifth, business school faculty and technology usage is covered. Next, business school students' exposure to technology is discussed. Instructor perceptions of clickers, and clickers and course and instructor evaluations are the last areas of exploration. Diffusion theory, methodology, results, and discussion are the remaining areas of coverage.

TECHNOLOGY USAGE ACROSS GENERATIONS

Technology is pervasive in US society. Exposure to various technologies occurs early in the lifecycle, is constant, and is continuously changing. As a result of this exposure, young people are more tech savvy than older generations (Perez, 2009; Stone, 2010). This is due, in part, to the accelerated pace in which technological changes are introduced. Fast-paced changes have created a series of mini-generation gaps where young people are heavily influenced by the technological tools available in their formative years (Stone, 2010). In an examination of multi-tasking and free time behavior, where free time was watching television, and tasking included texting, instant messaging, and Facebooking, 16-18 year olds perform an average of seven tasks; 20 year olds perform about six; and 30 year olds perform about five (Stone, 2010).

The technology generational gap has also been examined in the workplace. Perez (2009) reports on a study that reveals technology and software usage. Baby-boomers aged 44-60, members of Generation X aged 29-43, and members of Generation Y aged 28 and younger comprised the

study. Marked differences were found between Boomers and Generation Y. In fact, two-thirds of Boomers believe that PDA's and mobile phones contribute to the decline in workplace etiquette, and using a laptop during a meeting is distracting while less than half of Generation Y agreed. Twenty-eight percent of Boomers find blogging about work related issues acceptable as compared to 40% of members from Generation Y. Members of Generation Y were more inclined to access a social network from work as compared to Boomers, 62% and 14% respectively. Generation Y also reported spending about 10 hours a day online compared to about five hours for Boomers. Another study reporting on the technology use of professional Boomers asserts that using technology creates efficiencies in operations. As such, a reluctance to adopt technology will create a disadvantage making their firms less competitive than their wired counterparts (IOMA, 2009).

BUSINESS SCHOOL FACULTY CHARACTERISTICS

A generational depiction within the academic milieu is faculty rank. A recent AACSB report reveals various characteristics of business schools and their faculty (AACSB, 2011). Approximately 2044 business schools were represented in the report and within these schools, roughly 27,580 full-time faculty were identified. Among the schools represented in the report, roughly 46% of the faculty positions were full-time and tenured, and 19% were full-time non-tenure, tenure track and 17% were full-time non-tenured track. With respect to the tenure status of full-time faculty, 56% are tenured, 23% are untenured on tenure track, and 20% are non-tenured track. Faculty tenure status provides guidance in recognizing the significance of the academic hierarchy.

IMPLEMENTING CLICKERS TECHNOLOGY IN THE CLASSROOM

Deal (2007) identifies three basic approaches to implementing clickers technology. The most basic approach entails classroom monitoring. Within this context the technology is used to take attendance and encourage participation. Very few instructional changes are made with respect to the discussion and delivery of course material. At the next level, the instructor uses the technology to ascertain comprehension of concepts. Given student responses, assessments are made as to whether the lecture should proceed or, if further explanation of a concept is required. Students, by way of the technology, signal their level of confusion or understanding. The last approach entails examining teaching strategies and philosophies. At this level there is enhanced interaction as students respond to the clickers question and the instructor re-directs the discussion with additional engagement of students.

INSTRUCTOR MOTIVATIONS AND CLICKERS USAGE

Technological tools have been used in order to facilitate the engagement of students in classes with large enrollments. Clickers, in particular, have been secured in order to move beyond a one-way communication style that is prevalent in lecture halls. Shortcomings of the traditional one-way method of lecturing include limited student motivation to attend and pay attention in class, and the inability of students to learn complex and difficult course material (Draper, 1998). Introducing clickers technology is designed to address the aforementioned limitations by engaging students, making them more active in class and providing an opportunity for personal

involvement (Wood, 2004).

Increased student participation, attention, and understanding are specific rationales associated with using clickers. Despite increased class sizes, students are able to weigh-in on questions posed by an instructor. This interaction tends to be compromised in a more traditional, large lecture environment since too many students refrain from contributing to a discussion. Sources of their reluctance include: fear of making a mistake when articulating thoughts, fear of providing an incorrect response, fear of public embarrassment, and peer pressure not to engage in the classroom (Draper, 1998). Clickers may also be used to jumpstart a student's focus and attention. By inserting questions throughout a lecture, instructors may reduce mental fatigue and enhance recall. This is particularly salient at the beginning of class. In his study, Burns (1985) reports that the first five to 15 minutes of a lecture is the most memorable and the latter parts of a lecture become increasingly fuzzy. Moreover, the average attention span is about 20 minutes and recall drops precipitously after about 20 minutes.

Enhanced understanding of course material can be achieved with clickers technology. By inserting questions in the lecture, students are able to gauge their understanding, or lack thereof, of material and adjust accordingly. This is not only beneficial for the student, but the instructor too. The instructor also becomes aware of whether students are grasping the material as well as the degree of mastery (Wood, 2004). Subsequently, the instructor can course correct in order to respond to the level of understanding. Likewise, the instructor may surprisingly discover that a topic has been given sufficient coverage and the instructor can proceed with additional material. When using clickers to gauge understanding, the instructor needs to demonstrate flexibility. Since the responses are generated and received in real time, the instructor will need to handle the unexpected and proceed accordingly.

BUSINESS SCHOOL FACULTY AND TECHNOLOGY USAGE

Studies have explored the technology use of business school professors. In their study comparing academic technology use across disciplines, Guidry and Lorenz (2010) report that business and professional faculty are high users of technology and they use technology significantly more than their peers in other disciplines. Ball and Levy (2008) explored the factors that influence the technology use of information systems professors. The variables under investigation included computer self-efficacy, computer anxiety, and experience with using technology. The results indicate that computer self-efficacy has the most significant impact on a professor's intent to use technology. In their investigation of business faculty use of technology, Zhao, Alexander, Perreault and Waldman (2007) indicate that faculty more frequently used Internet related technologies. Moreover, the results indicate that faculty rate Internet and web oriented discussion groups a productivity enhancer. Buzzard, Crittenden, Crittenden and McCarty (2011) report that business faculty prefer to use course learning technology and they have stronger technology preferences than professors in fine arts and life sciences.

BUSINESS SCHOOL STUDENTS EXPOSURE TO TECHNOLOGY

Schools of business are increasing the technology offerings that enhance student exposure. This is done in part to facilitate better learning of subject matter. These schools also recognize that

given the significance of technology in the workplace, students will need experience and facility of various technologies. In their investigation of student comfort level with using software to analyze business problems, Cauley, Aiken and Whitney (2010) found that greater comfort levels relate to greater proficiency scores. In Buzzard, Crittenden, Crittenden and McCarty's (2011) report, business students have stronger technology preferences than students in fine arts and life sciences. In a study of IT and pedagogical perspectives, Crandall, Lim and Ro (2010) report that business students were not distracted by technology aids used in class. They also reveal that these students would prefer greater use of technology in class. Campus Technology (2009) reports that 38% of the students in their study believe that instructors understand technology and integrate it in the classroom. Ilacqua, Park, Gannon and Allen (2007) report on the introduction of software in order to increase student interaction through the use of collaborative note-taking. Macro-economics students were subjects in the study and they reported a positive experience with the technology.

INSTRUCTOR PERCEPTIONS OF CLICKERS TECHNOLOGY

In general, instructor perceptions of clickers are favorable. Instructors indicate that clickers assist the learning process by gauging understanding. Draper (2002) reports that instructors modify their teaching based on student responses thereby providing what students believe they need with respect to instruction. Beekes (2006) finds that students appear to be more receptive to technical material. Elliot (2003) suggests that the technology stimulated student interest and their ability to concentrate which improved their class performance. Beatty (2004) reports that students are more attentive during class and that fewer students slept during lectures. Wood (2004) reveals that instructors found the technology to be far more enjoyable than the traditional approach to teaching.

While instructor perceptions of clickers tend to be positive, there are concerns about the technology. Less than positive attitudes are attributed to technology issues, preparation time, and decreased lecture time. Proper support from information technology (IT) departments is critical. When the system encounters problems instructors believe that IT should have the capability to quickly trouble-shoot and problem solve (Brewer, 2004). When this does not occur, instructors become disenchanted with the technology. Moreover, some instructors dread the training required prior to usage. Interestingly, the source of apprehension may be that they are either tech savvy and believe the training to be a waste of time or, they are tech challenged and believe the training will be overwhelming. Increased preparation for clickers based courses is another area of discontent among instructors. It seems that some instructors believe that the process of creating questions and placing them in the proper format is somewhat onerous and contributes to their course preparation time. Another concern among instructors is the decreased lecture time and subsequently, the limited coverage of material (Simpson & Oliver, 2006). Believing that less time will be devoted to course material creates apprehension about the value of the technology and the outcomes associated with using it.

CLICKERS TECHNOLOGY AND COURSE AND INSTRUCTOR EVALUATIONS

Studies indicate that clickers technology have a positive impact on course evaluations. Miller (2003) reports that students who attended a course with clickers technology rated both the lecture

and the speaker higher than students not using the technology. Similarly, Copeland (1998) finds that lectures using clickers technology were rated higher than lectures not using the technology. Instructor evaluations yield similar results. Nichol and Boyle (2003) state that students believed that instructors were more cognizant of their needs and viewed instructor teaching styles as warm and friendly. Copeland (1998) reveals that instructors using clickers were rated more favorably than those not using the technology. Interestingly, the results remained consistent even when an instructor taught one course with the technology and another course without it.

DIFFUSION THEORY

Numerous studies have examined diffusion theory and the factors that help or hinder adoption of an idea. One of the most frequently discussed theories is the Diffusion of Innovations concept developed by Everett Rogers (1995). Specifically, Rogers (1995) describes five constructs that may be used to explain the adoption or rejection of an innovation: (1) *relative advantage* [perceived to be better than current idea, practice, and so on]; (2) *compatibility* [perceived to be consistent with current goals and experiences]; (3) *complexity* [perception of degree of difficulty to use]; (4) *trialability* [perception as to experiment time]; and (5) *observability* [perception of how visible results are to others]. Davis (1989) offers an alternative but complementary theory, the Technology Acceptance Model, which suggests that *perceived usefulness* and *ease of use* affect the adoption process. Several studies (Davis, 1989; Karahanna, Straub & Chevany, 1999) indicate that these factors [*perceived usefulness* and *ease of use*] are somewhat comparable to *relative advantage* and *complexity*, respectively, and these factors relate to adoption.

SAMPLE AND METHODS

Eighty-five instructors of Business Administration participated in the study. The instructors taught at one of three large state schools in the Southwest. Instructors taught a Principles of Management, Principles of Marketing, or a Principles of Accounting course during the Fall, 2009 or Spring, 2010 semesters. All courses are required for Business Administration majors. Twenty-nine of the instructors were assistant professors, 28 were associate professors, and 28 were full professors.

The instructors taught a section of Principles of Management, Principles of Marketing, or Principles of Accounting that used clickers technology. Instructors also taught a section of Principles of Management, Principles of Marketing, or Principles of Accounting that did not use the technology. In total, 56 sections of Principles of Management, 52 sections of Principles of Marketing, and 68 sections of Principles of Accounting were surveyed. Instructors taught from common syllabi. Each instructor created clickers questions that were used during the semester. All instructors were familiar with clickers technology and had previously taught at least one semester using the technology.

During lectures throughout the semester, instructors inserted three to five clickers generated questions. Students responded to the questions via clicker during each class. At the end of the semester, instructors completed a self-assessment instrument that examined their attitudes toward clickers technology. Demographic information was also collected. Course and instructor evaluation data were supplied by Department Chairs. Scores on the course and instructor

evaluation instruments range from one (least effective) to five (most effective).

The questionnaire is a modification of the instrument used by Crossgrove and Curran (2008). Attitudes are assessed with four variables including: engagement, understanding, learning, and strategy. The constructs for each variable include: ENG involvement, ENG attention, ENG interaction, ENG participation, UBU understanding, USH score higher, LMOT motivated to learn, LCON connect ideas, SINTT, interactive teaching, SINLRN, interactive learning, SACLAS active classroom, SSDIS shift discussion, SCLAST, devote class time to questions. In total, the four variables were measured by 13 items using a Likert scale that ranges from strongly disagree (1) to strongly agree (5).

The ANOVA technique was used to analyze the hypotheses. Four hypotheses were generated about differences in perceptions of the technology and four hypotheses examine course and instructor evaluations.

H_1:   The perception that the clicker enables better engagement in the classroom will differ by faculty rank.

H_2:   The perception that the clicker enables greater understanding of course material will differ by faculty rank.

H_3:   The perception that the clicker enables greater learning of course material will differ by faculty rank.

H_4:   Instructor technology strategy will vary by faculty rank.

H_5:   Course evaluations of instructors teaching with clickers will differ from instructors not teaching with a clicker.

H_6:   Instructor evaluations of instructors teaching with clickers will differ from instructors not teaching with clickers.

H_7:   Course evaluations of instructors teaching with clickers will vary by rank.

H_8:   Instructor evaluations of instructors teaching with clickers will vary by rank.

RESULTS

Table 1 illustrates that the results of the ANOVA analysis were significant at the .01 level and all hypotheses were supported. The perception that clickers technology enables better engagement (H_1), understanding (H_2), and learning (H_3) varied by faculty rank. Instructor technology strategy also varied by faculty rank (H_4). Course and instructor evaluations of clickers users differed from their non-clickers using counterparts (H_5, H_6). Course and instructor evaluations of clickers and non-clickers users varied by faculty rank (H_7, H_8).

TABLE 1. ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
ENGINV	Between Groups	23.491	2	11.745	35.917	.000
	Within Groups	26.815	82	.327		
	Total	50.306	84			
ENGATT	Between Groups	34.593	2	17.297	46.917	.000
	Within Groups	30.230	82	.369		
	Total	64.824	84			
ENGINT	Between Groups	22.859	2	11.430	29.693	.000
	Within Groups	31.564	82	.385		
	Total	54.424	84			
ENGPAR	Between Groups	35.288	2	17.644	48.869	.000
	Within Groups	29.606	82	.361		
	Total	64.894	84			
UBU	Between Groups	37.433	2	18.717	32.992	.000
	Within Groups	46.520	82	.567		
	Total	83.953	84			
USH	Between Groups	40.975	2	20.487	31.089	.000
	Within Groups	54.037	82	.659		
	Total	95.012	84			
LMOT	Between Groups	47.362	2	23.681	59.155	.000
	Within Groups	32.826	82	.400		
	Total	80.188	84			
LCON	Between Groups	52.643	2	26.322	62.417	.000
	Within Groups	34.580	82	.422		
	Total	87.224	84			
SINTEAC	Between Groups	86.058	2	43.029	96.156	.000
	Within Groups	36.695	82	.447		
	Total	122.753	84			

SINLEA	Between Groups	78.674	2	39.337	69.788	.000
	Within Groups	46.220	82	.564		
	Total	124.894	84			
SICLASS	Between Groups	106.097	2	53.048	126.118	.000
	Within Groups	34.491	82	.421		
	Total	140.588	84			
SSDISC	Between Groups	122.515	2	61.258	117.615	.000
	Within Groups	42.708	82	.521		
	Total	165.224	84			
SCLAST	Between Groups	105.232	2	52.616	120.981	.000
	Within Groups	35.663	82	.435		
	Total	140.894	84			
CEVALC	Between Groups	40.385	2	20.192	249.161	.000
	Within Groups	6.645	82	.081		
	Total	47.030	84			
CEVALNCL	Between Groups	27.151	2	13.575	113.901	.000
	Within Groups	9.773	82	.119		
	Total	36.924	84			
IEVALC	Between Groups	45.473	2	22.737	326.459	.000
	Within Groups	5.711	82	.070		
	Total	51.184	84			
IEVALNC	Between Groups	35.044	2	17.522	155.701	.000
	Within Groups	9.228	82	.113		
	Total	44.272	84			

Given the significance of the ANOVA analysis, Tukey's HSD post hoc test of group differences was executed. Table 2 reveals the specific, statistically significant differences between the faculty groups. This analysis reveals that full professors differed from assistants and associates in their engagement and understanding perceptions of the technology. For the learning variable, there were differences between all faculty groups. For the strategy variable, full professors differed from assistants and associates on the interactive teaching, interactive classroom, and shift discussion constructs. There were differences between all faculty groups on the interactive learning, and devote class time constructs for the strategy variable.

TABLE 2. TUKEY'S HSD MULTIPLE COMPARISONS

Dependent Variable	(I) RANK	(J) RANK	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
ENGINV	1.00	2.00	.08744	.15151	.833	-.2742	.4491
		3.00	1.15887*	.15151	.000	.7972	1.5205
	2.00	1.00	-.08744	.15151	.833	-.4491	.2742
		3.00	1.07143*	.15283	.000	.7066	1.4362
	3.00	1.00	-1.15887*	.15151	.000	-1.5205	-.7972
		2.00	-1.07143*	.15283	.000	-1.4362	-.7066
ENGATT	1.00	2.00	.19089	.16087	.465	-.1931	.5749
		3.00	1.44089*	.16087	.000	1.0569	1.8249
	2.00	1.00	-.19089	.16087	.465	-.5749	.1931
		3.00	1.25000*	.16227	.000	.8627	1.6373
	3.00	1.00	-1.44089*	.16087	.000	-1.8249	-1.0569
		2.00	-1.25000*	.16227	.000	-1.6373	-.8627
ENGINT	1.00	2.00	.06034	.16438	.928	-.3320	.4527
		3.00	1.13177*	.16438	.000	.7394	1.5241
	2.00	1.00	-.06034	.16438	.928	-.4527	.3320
		3.00	1.07143*	.16582	.000	.6756	1.4672
	3.00	1.00	-1.13177*	.16438	.000	-1.5241	-.7394
		2.00	-1.07143*	.16582	.000	-1.4672	-.6756
ENGPAR	1.00	2.00	.37192	.15920	.056	-.0081	.7519
		3.00	1.51478*	.15920	.000	1.1348	1.8948
	2.00	1.00	-.37192	.15920	.056	-.7519	.0081
		3.00	1.14286*	.16059	.000	.7595	1.5262
	3.00	1.00	-1.51478*	.15920	.000	-1.8948	-1.1348
		2.00	-1.14286*	.16059	.000	-1.5262	-.7595

UBU	1.00	2.00	.10222	.19956	.866	-.3741	.5786
		3.00	1.45936*	.19956	.000	.9830	1.9357
	2.00	1.00	-.10222	.19956	.866	-.5786	.3741
		3.00	1.35714*	.20130	.000	.8766	1.8377
	3.00	1.00	-1.45936*	.19956	.000	-1.9357	-.9830
		2.00	-1.35714*	.20130	.000	-1.8377	-.8766
USH	1.00	2.00	.21305	.21508	.585	-.3003	.7264
		3.00	1.57020*	.21508	.000	1.0568	2.0836
	2.00	1.00	-.21305	.21508	.585	-.7264	.3003
		3.00	1.35714*	.21696	.000	.8393	1.8750
	3.00	1.00	-1.57020*	.21508	.000	-2.0836	-1.0568
		2.00	-1.35714*	.21696	.000	-1.8750	-.8393
LMOT	1.00	2.00	.78325*	.16763	.000	.3831	1.1834
		3.00	1.81897*	.16763	.000	1.4188	2.2191
	2.00	1.00	-.78325*	.16763	.000	-1.1834	-.3831
		3.00	1.03571*	.16910	.000	.6321	1.4394
	3.00	1.00	-1.81897*	.16763	.000	-2.2191	-1.4188
		2.00	-1.03571*	.16910	.000	-1.4394	-.6321
LCON	1.00	2.00	.88547*	.17205	.000	.4748	1.2962
		3.00	1.92118*	.17205	.000	1.5105	2.3319
	2.00	1.00	-.88547*	.17205	.000	-1.2962	-.4748
		3.00	1.03571*	.17356	.000	.6214	1.4500
	3.00	1.00	-1.92118*	.17205	.000	-2.3319	-1.5105
		2.00	-1.03571*	.17356	.000	-1.4500	-.6214
SINTEAC	1.00	2.00	.36946	.17724	.099	-.0536	.7925
		3.00	2.29803*	.17724	.000	1.8750	2.7211
	2.00	1.00	-.36946	.17724	.099	-.7925	.0536
		3.00	1.92857*	.17878	.000	1.5018	2.3553
	3.00	1.00	-2.29803*	.17724	.000	-2.7211	-1.8750
		2.00	-1.92857*	.17878	.000	-2.3553	-1.5018
SINLEA	1.00	2.00	.59360*	.19892	.010	.1188	1.0684
		3.00	2.27217*	.19892	.000	1.7974	2.7470

	2.00	1.00	-.59360*	.19892	.010	-1.0684	-.1188
		3.00	1.67857*	.20065	.000	1.1996	2.1575
	3.00	1.00	-2.27217*	.19892	.000	-2.7470	-1.7974
		2.00	-1.67857*	.20065	.000	-2.1575	-1.1996
SICLASS	1.00	2.00	.23276	.17183	.370	-.1774	.6429
		3.00	2.48276*	.17183	.000	2.0726	2.8929
	2.00	1.00	-.23276	.17183	.370	-.6429	.1774
		3.00	2.25000*	.17333	.000	1.8363	2.6637
	3.00	1.00	-2.48276*	.17183	.000	-2.8929	-2.0726
		2.00	-2.25000*	.17333	.000	-2.6637	-1.8363
SSDISC	1.00	2.00	.40887	.19121	.088	-.0475	.8653
		3.00	2.73030*	.19121	.000	2.2739	3.1867
	2.00	1.00	-.40887	.19121	.088	-.8653	.0475
		3.00	2.32143*	.19288	.000	1.8610	2.7818
	3.00	1.00	-2.73030*	.19121	.000	-3.1867	-2.2739
		2.00	-2.32143*	.19288	.000	-2.7818	-1.8610
SCLAST	1.00	2.00	.88793*	.17473	.000	.4709	1.3050
		3.00	2.67365*	.17473	.000	2.2566	3.0907
	2.00	1.00	-.88793*	.17473	.000	-1.3050	-.4709
		3.00	1.78571*	.17625	.000	1.3650	2.2064
	3.00	1.00	-2.67365*	.17473	.000	-3.0907	-2.2566
		2.00	-1.78571*	.17625	.000	-2.2064	-1.3650
CEVALC	1.00	2.00	-.20690*	.07542	.020	-.3869	-.0269
		3.00	1.35382*	.07542	.000	1.1738	1.5339
	2.00	1.00	.20690*	.07542	.020	.0269	.3869
		3.00	1.56071*	.07608	.000	1.3791	1.7423
	3.00	1.00	-1.35382*	.07542	.000	-1.5339	-1.1738
		2.00	-1.56071*	.07608	.000	-1.7423	-1.3791
CEVALNCL	1.00	2.00	.15788	.09147	.202	-.0605	.3762
		3.00	1.27217*	.09147	.000	1.0538	1.4905
	2.00	1.00	-.15788	.09147	.202	-.3762	.0605
		3.00	1.11429*	.09227	.000	.8940	1.3345

	3.00	1.00	-1.27217*	.09147	.000	-1.4905	-1.0538
		2.00	-1.11429*	.09227	.000	-1.3345	-.8940
IEVALC	1.00	2.00	-.10542	.06992	.293	-.2723	.0615
		3.00	1.50172*	.06992	.000	1.3348	1.6686
	2.00	1.00	.10542	.06992	.293	-.0615	.2723
		3.00	1.60714*	.07053	.000	1.4388	1.7755
	3.00	1.00	-1.50172*	.06992	.000	-1.6686	-1.3348
		2.00	-1.60714*	.07053	.000	-1.7755	-1.4388
IEVALNC	1.00	2.00	.61207*	.08888	.000	.3999	.8242
		3.00	1.55850*	.08888	.000	1.3463	1.7707
	2.00	1.00	-.61207*	.08888	.000	-.8242	-.3999
		3.00	.94643*	.08966	.000	.7324	1.1604
	3.00	1.00	-1.55850*	.08888	.000	-1.7707	-1.3463
		2.00	-.94643*	.08966	.000	-1.1604	-.7324

 * The mean difference is significant at the 0.05 level.

In terms of the evaluation scores, course and instructor evaluations also revealed differences between faculty groups. Specifically, there were differences between all faculty groups with respect to course evaluations of clickers users. Non-clickers course evaluations differed between full professors (full), and associate and assistant professors. Instructor evaluations of clickers users revealed that full professors differed from associate and assistant professors. For non-clickers instructor evaluations, there were differences between all faculty groups.

Table 3 illustrates the mean differences for the study. The engagement variable has four constructs and the mean for assistant professors was higher for each construct as compared to the other faculty ranks. Following are the mean differences for each construct. For ENGINV the mean for assistants is 4.55, for associates 4.46, and full professors (fulls), 3.39. For ENGATT the mean for assistants is 4.65, for associates 4.46, and fulls, 3.21. For ENGINT the mean for assistants is 4.31, for associates 4.25, and fulls, 3.17. For ENGPAR the mean for assistants is 4.58, for associates 4.21, and fulls, 3.07.

TABLE 3. MEANS

RANK		ENGINV	ENGATT	ENGINT	ENGPAR	UBU	USH	LMOT
1.00	Mean	4.5517	4.6552	4.3103	4.5862	4.1379	4.0345	4.0690
	N	29	29	29	29	29	29	29
	Std. Deviation	.50612	.48373	.60376	.50123	.69303	.82301	.65088

2.00	Mean	4.4643	4.4643	4.2500	4.2143	4.0357	3.8214	3.2857
	N	28	28	28	28	28	28	28
	Std. Deviation	.50787	.50787	.51819	.49868	.79266	.86297	.65868
3.00	Mean	3.3929	3.2143	3.1786	3.0714	2.6786	2.4643	2.2500
	N	28	28	28	28	28	28	28
	Std. Deviation	.68526	.78680	.72283	.76636	.77237	.74447	.58531
Total	Mean	4.1412	4.1176	3.9176	3.9647	3.6235	3.4471	3.2118
	N	85	85	85	85	85	85	85
	Std. Deviation	.77387	.87847	.80492	.87895	.99972	1.06353	.97705

TABLE 3. CONTINUED

RANK		LCON	SINTEAC	SINLEA	SICLASS	SSDISC	SCLAST	CEVALC
1.00	Mean	4.2069	4.6552	4.3793	4.4828	4.5517	4.1379	3.8931
	N	29	29	29	29	29	29	29
	Std. Deviation	.61987	.48373	.62185	.50855	.57235	.78940	.37790
2.00	Mean	3.3214	4.2857	3.7857	4.2500	4.1429	3.2500	4.1000
	N	28	28	28	28	28	28	28
	Std. Deviation	.66964	.65868	.68622	.64550	.75593	.51819	.19626
3.00	Mean	2.2857	2.3571	2.1071	2.0000	1.8214	1.4643	2.5393
	N	28	28	28	28	28	28	28
	Std. Deviation	.65868	.82616	.91649	.76980	.81892	.63725	.24395
Total	Mean	3.2824	3.7765	3.4353	3.5882	3.5176	2.9647	3.5153
	N	85	85	85	85	85	85	85
	Std. Deviation	1.01901	1.20886	1.21936	1.29370	1.40248	1.29511	.74825

TABLE 3. CONTINUED

RANK		CEVALNCL	IEVALC	IEVALNC
1.00	Mean	3.4793	3.9517	3.5621
	N	29	29	29
	Std. Deviation	.40829	.34808	.35296

		3.3214	4.0571	2.9500
2.00	Mean	3.3214	4.0571	2.9500
	N	28	28	28
	Std. Deviation	.38907	.16872	.43162
3.00	Mean	2.2071	2.4500	2.0036
	N	28	28	28
	Std. Deviation	.19423	.23960	.16212
Total	Mean	3.0082	3.4918	2.8471
	N	85	85	85
	Std. Deviation	.66300	.78060	.72598

The understanding variable has two constructs. The mean for assistant professors was higher for both constructs. For UBU the mean for assistants was 4.13, for associates, 4.03, and full professors (fulls), 2.67. For USH the mean for assistant professors was 4.03, for associates 3.82, and fulls 2.46. Two constructs assess the learning variable. The mean for assistant professors was higher for both constructs. For LMOT the mean for assistants was 4.06, for associates, 3.28, and fulls, 2.25. For LCON the mean for assistant professors was 4.20, for associates 3.32, and fulls 2.28. The strategy variable has five constructs. The mean for assistant professors was higher for each construct as compared to the other faculty ranks. For SINTEAC the mean for assistants is 4.65, for associates 4.28, and fulls, 2.35. For SINLEA the mean for assistants is 4.37, for associates 3.78, and fulls, 2.10. For SICLASS the mean for assistants is 4.48, for associates 4.25, and fulls, 2.00. For SSDISC the mean for assistants is 4.55, for associates 4.14, and fulls, 1.82. For SCLAST the mean for assistants is 4.13, for associates 3.25, and fulls, 1.46. With respect to course evaluations of clickers users, associate professors had the highest mean (4.10) followed by assistants (3.89) and then fulls (2.53). Mean scores, for course evaluations of non-clickers courses, were highest for assistants (3.47), followed by associates (3.32), and then fulls (2.20).

Upon review of instructor evaluations of clickers users, associate professors had the highest mean (4.05) followed by assistants (3.95) and then fulls (2.45). Mean scores, for instructor evaluations of non-clickers courses, were highest for assistants (3.56), followed by associates (2.95) and then fulls (2.00).

DISCUSSION

The results of the study indicate that instructor attitudes toward clickers vary by faculty rank; course and instructor evaluations of clickers courses were higher than non-clickers courses; and course and instructor evaluations vary by faculty rank. Overall, assistant professors had the most positive attitudes towards clickers as their mean scores were highest for each variable as compared to other faculty groups. Assistant professors clearly feel that clickers facilitate more engagement, understanding, and learning in the classroom. Moreover, they are more favorable toward the use of clickers as a technology strategy as compared to other faculty groups. The findings are consistent with research revealing generational differences with respect to technology.

Upon review of faculty group differences, the greatest variance in attitudes occurred between both assistant and associate professors, and full professors. Assistant and associate professors felt that the clickers technology improved the atmosphere of the class due to increased interaction and student participation. These instructors also found the technology beneficial for students as it could assist their understanding and learning of course material which would enable them to do well on exams. With respect to clickers, as a technology strategy, assistant and associate professors held more favorable attitudes. These faculty members had greater belief that technology enhances interactive teaching and promotes an interactive classroom. Moreover, these instructors are more inclined to shift the class discussion based on clicker results.

All faculty groups varied in their perceptions of the learning variable. It seems that each group held a different attitude about the role of clickers as it relates to the student's motivation to learn and connect ideas. Each faculty group also held different notions of technology strategy as it relates to facilitating interactive learning. Varying perspectives among faculty groups also exist concerning the amount of class time devoted to using clickers.

For the most part, the findings indicate that assistant and associate professors held more similar and favorable attitudes toward clickers as opposed to full professors. Full professors were clearly less favorable toward the technology. Since most full professors are likely part of the Baby-Boomer generation, they may be less inclined to adopt new technology. Their perceptions may be that clickers are difficult to use, waste valuable class time, and they facilitate no real learning. These ideas speak to the notion of relative advantage as discussed by Rodgers (1995). Rodgers asserts that prior to adopting a new technology the user often evaluates the benefit associated with the new technology and whether adoption of the technology is actually useful.

Two particularly interesting results reveal the attitudes of full professors toward using clickers as a technology strategy. First, full professors in the study were overwhelmingly less favorable to using class time to explore clickers based questions. Second, they were less inclined to shift the class discussion based on clickers responses. These reactions may be due, in part, to a required, immediate, and somewhat spontaneous reaction to an unforeseen topic. As such, this activity requires flexibility based on student responses. Subsequently, the professor can't necessarily maintain the fixed agenda for the class session, and ultimately the course. The idea of not covering allotted material may be a source of discomfort which gravely impacts attitudes toward the technology. These sentiments are consistent with the concept of compatibility as developed by Rodgers (1995). In his discussion about compatibility, Rodgers suggests that a potential new technology adopter analyzes how consistent the new technology is in comparison to current approaches. The results of this assessment will contribute to the new technology adoption decision.

With respect to course and instructor evaluations, there were distinct differences. Courses with clickers were viewed more favorably than non-clickers courses. Instructor evaluations of clickers users were higher than their counterparts not using clickers. In terms of faculty group differences, interestingly, associate professors using clickers were evaluated more favorably on both course and instructor evaluations. This finding may be the result of these professors having a combination of academic experience, and facility with the technology. Moreover, assistant professors had the highest evaluations for both course and instructor evaluations for non-clickers

users. Perhaps assistant professors are viewed more positively as they are among the newest additions to the faculty and students may perceive them as a fresh alternative to existing faculty. Another interesting finding is that full professors received the lowest course and instructor evaluations, independent of clicker usage. However, upon clickers usage, both course and instructor scores for full professors improved.

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INTERNATIONAL NEW VENTURES COMPETITIVENESS: A RESOURCE-BASED VIEW APPROACH

Jean-Michel Quentier, ESC Bretagne Brest, Brittany School of Business
jean-michel.quentier@esc-bretagne-brest.com

ABSTRACT

Drawing on the Dynamic Capabilities Perspective and the Resource Based View (RBV) of the firm, this paper seeks to further our understanding of international new ventures operating in a traditional commodity sector. We believe that this study can contribute to our knowledge on understanding how international new ventures (INVs) in traditionally low-tech sectors develop competitive advantage. The study reveals an entrepreneurial perspective to the Dynamic Capabilities theory of the firm and presents a conceptual research framework to further our understanding on INVs.

INTRODUCTION

International entrepreneurship (IE) is described as "a process of creatively discovering and exploiting opportunities that lie outside a firm's domestic markets in the pursuit of competitive advantage" (Zahra & George, 2002). International new ventures (INVs) constitute a form of international entrepreneurship. From inception, they 'seek to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries' (McDougall et al., 1994). Many studies hold that for INVs to internationalise successfully much depends on the internal capabilities of the firm (McDougall et al., 1994; Autio et al., 2000; Zahra et al., 2000). Faced with wealthy, experienced multinationals (MNEs), INVs need to develop their own unique and dynamic competencies – manifested through unique knowledge-intensive assets (technological offerings) and the ability to utilise technology effectively (Teece et al., 1997; Hamel & Prahalad, 1990; Eisenhardt & Martin, 2000). Furthermore, INVs with superior technologies and an internationally experienced and proactive entrepreneurial team are more likely to acquire international competitive advantage early than those without (McDougall et al., 2003; Rialp et al., 2005; Aspelund et al., 2007; Weerawardena et al., 2007).

International entrepreneurship (IE) literature has tended to focus on firms operating in high-technology and knowledge-intensive sectors of the economy, with little attention devoted to how INVs in mature, low-technology industries develop competitive advantage on international markets (see Fillis, 2000; Knight et al., 2001; Wickramasekera & Bamberry, 2001; Belso-Martinez, 2006; Evers & O'Gorman, forthcoming). This study uses the OECD industry

classifications to distinguish between high and low technology sector[1]. Low-tech sectors mainly comprise "mature" industries such as food processing, publishing and furniture industries. These industries are more challenged by the globalization processes, such as rapid advancements in technology and ICT, and as their products can be easily imitable to a large extent they can ultimately fail under cost and competition pressures.

However, international performance is also a function of an entrepreneur's managerial competence (Chandler & Hanks, 1994). High-performing INVs can also show timely responsiveness, flexibility, and managerial capabilities such as the ability to innovate and develop knowledge and a network of resources for competitive advantage (Teece, 2000; Nooteboom, 2002; Weerawardena et al., 2007). Zahra et al. (2000) also found that it was not the technology or the R&D, per se that facilitated successful internationalisation processes, but rather the network linkages embedded in the entrepreneurial team.

We know little about the resources, knowledge and capabilities that can underpin the competitiveness of INVs where technologically embedded offerings are not a core component of competitive advantage, and where industry dynamics can differ greatly from each other. With only a handful of INV studies on low-tech sectors, this study draws on the dynamic capabilities perspective (Teece et al., 1997) and RBV (Barney, 1991) to investigate how INVs operating in a low technology sector of the global economy, namely seafood, develop and sustain competitive advantage on international markets.

Despite much sophisticated theoretical conceptualizations of the Dynamic Capabilities perspective of the firm (Teece et al., 1997; Eisenhardt & Martin; 2000; Weerawardena et al., 2007) empirical studies have been limited in explaining how Dynamic Capabilities are actually developed and manifested in INVs. Although existing empirical studies suggest that firms develop Dynamic Capabilities through building, adapting and reconfiguring existing capabilities (Montealegre, 2002; Zucchella, 2005), case studies have been called for to effectively capture dynamic capability development in the present context of INVs. Drawing on three in-depth cases of highly export-dependant Irish ventures operating in a traditionally low-technology sector, namely the global seafood industry, this study seeks to explore two research questions:

1. How does new seafood export ventures firms develop and sustain competitive advantage on international markets?
2. What are the strategic attributes of new seafood export ventures firms that explain their international competitiveness?

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[1] According to OECD a key determinant of industry classification is the level of R&D intensity within the sector. A common indicator that is used internationally to measure the ratio of the R&D expenditure to the turnover of a company or a business sector. The OECD distinguished between industries in terms of R&D intensities, with those (such as ICT or pharmaceuticals) spending more than 4% of turnover being classified as high-technology, those spending between 1% and 4% of turnover (such as vehicles or chemicals) being classified as medium-tech, and those spending less than 1% (such as textiles or food) as 'low tech'. Hence 'low tech sectors comprise for the most part "mature" industries such as the manufacture of household appliances, the food industry, the paper, publishing and print industry, the wood and furniture industry'. (OECD, **OECD Science and Technology Indicators, No 2: R&D, Innovation and Competitiveness**, (OECD:Paris), pp. 58-61.

Before proceeding with the literature review, the context of the study follows. The methodology and the case summaries are presented. Findings and discussion follows, leading to a conceptual research framework for further research. Finally, conclusions and implications of the study are identified.

Context

The Irish economy is highly dependant on seafood exports with over 55% of total produce exported in 2007 (BIM, 2008). The seafood industry is viewed by the National social and economic policy as an important way of developing economic activity in remote and economically disadvantaged regions. The seafood industry itself is a global one and exhibits a high degree of environmental turbulence and volatility. Typical of a low technology sector, the global seafood industry is mainly commodity driven, characterised by increasingly price-sensitive customers, and is hampered by supply issues pertaining to legal quotas and occasional ecological threats.

Firms are also exposed to challenges such as national and international health and safety food regulations, and competition based on quality and service delivery. Irish seafood exporters are faced with increasing global competition from larger seafood producers in Asia and South America, leading to cut-throat price competition. Given the importance of the seafood sector for the Irish economy, acquiring and sustaining competitive advantage is of critical importance to not only their own survival on foreign markets but for the Irish economy, which is heavily reliant on the seafood sector for driving indigenous exports.

LITERATURE REVIEW

Synthesis of Key Findings: Strategic Attributes of INVs

Rialp et al.'s (2005) work and more recently the work of Aspelund et al (2007) and Keupp and Gassmann (2009) have provided comprehensive literature reviews on the body of published studies on INVs. Building on these works, this review is more specific in its scope, by identifying those attributes of INVs underpinning their international competitiveness. This study defines strategic attributes as those firm resources and capabilities that enable an INV to develop and sustain competitiveness on international markets at an early stage in its life-cycle. These are typically internal resources, and they provide the firm with a unique and sustainable advantage over competitors (Penrose, 1959).

Table 1 (below) clusters the key strategic attributes most supported in the INV literature. A number of observations can be made in this regard.

**TABLE 1. KEY STRATEGIC ATTRIBUTES
OF INTERNATIONAL NEW VENTURES**

Entrepreneurial attribute	Author	Firm attribute	Author
Global orientation of founder international work experience	Ganitsky, 1989; Jolly et al., 1992;Knight & Cavusgil, 1996; Knight,1997; McKinsey,1990;Eriksson, Makjgard & Sharma, 1997; Servais & Rasmussen, 2000; McDougall & Oviatt, 1995,1994,2003; Harveston et al., 2000; Larimo, 2001; Pulkkinen & Larimo, 2002; Saarenkeeto et al., 2003; Moen, 2000,2001; Rialp et al., 2002;Aspelund & Moen, 2001; Fletcher, 2000; Knight 2001. Andersson & Evangelista, 2006	**Superior technology and high knowledge intensity**	McKinsey& Co., 1993; Bloodgood & Sapienza, 1996; Oviatt & McDougall, 1994; Larimo, 2001; Jolly et al., 1992; Rialp et al., 2002; Bloodgood et al., 1996; McDougall et al., 1994Larimo, 2001; Rialp et al., 2002; Sapienza, Autio & Almeida, 2000; Zahra et al., 2001; McKinsey , 1993; Bloodgood & Sapienza, 1996; Jolly et al., 1992; Johnson ,2004. Keeble, 1999
Strong international business networks prior to inception	Larimo, 2001; Madsen & Servais, 1997; Oviatt & McDougall, 1994; Loane and Bell, 2006; Andersson & Evangelista, 2006	**Global niche market strategy**	Larimo, 2001; Jolly et al., 1992; Madsen, Rasmussen & Servais , 2000; Zuchella, 2002; Moen, 2002; Aspelund & Moen, 2001. Madsen and Servais, 1997; Bloodgod et al., 1996; Oviatt and McDougall, 1994; Knight and Cavusgil, 1996; Knight , Bell and McNaughton, 2001; Servais and Rasmussen, 2000. Rennie (1993); Keeble et al, 1999;
Experiential industry knowledge	Larimo, 2001; Wickramasekera & Bamberry2001; Rasmussen et al., 2001.	**Customer orientation**	Jolly et al., 1992; Larimo, 2001; Aspelund & Moen, 2001.

First, by drawing on the key attributes that are well-supported across studies, we can create a profile of INVs. Noting the high concentration of studies on INVs in high technology sector (see Jolly et al., 1992; Knight & Cavusgil, 1996; Jones, 1999), one can assume that these attributes are not necessarily specific to low tech sectors of the economy. Secondly, a firm's unique knowledge-intensive assets (in the form of technological offerings) and their ability to utilise

technology effectively (McDougall et al 2003) create the basis for competitive advantage and accelerate early and successful internationalisation of new firms (Autio & Sapienza, 2000). Thirdly, studies also support the view that entrepreneur-specific capabilities are important for international performance (Knight & Cavusgil, 1996; McDougall & Oviatt, 1996; Zucchella et al., 2005), can influence the strategic management and direction of the firm (Kuinvalainen & Bell, 2004; Weerawardena et al., 2007).

Attributes of the INV Entrepreneur

From this review, the attributes (Table 1) can be examined at two levels: 1) The Entrepreneur, and 2) the Firm. Drawing on Hutchinson et al.'s (2006), categorization of managerial characteristics, the attributes associated with INV entrepreneurs can be categorized in to objective capabilities and subjective capabilities.

Objective capabilities are identified as the founder's possession of prior experiential international work experience, prior industry knowledge, and networks. Such prior experiential knowledge and knowledge of network ties represent a unique resource for the firm in the form of human capital ie. the INV founder-manager. In their comparison of domestic new ventures and INVs, McDougall et al. (2003) found that INV founder's prior international experience was cited as a key factor that distinguished INVs other new ventures. McDougall et al. (2003) also identify the founder's prior international work experience as critical experience for the firm to leverage however they also suggest that suggest that the founder's prior generalist experience in the form of technical, marketing and start-up were valuable types of knowledge for the firm. However, 'economic rents for the firm' will not be generated from objective knowledge and capabilities if managerial effort and motivation are lacking or misdirected (Castanias & Helfat, 2001), hence we turn to subjective capabilities of the INV founder.

Subjective capabilities: In the context of entrepreneurial behaviour, Bateman and Crant (1993) refer to the construct of a proactive personality, which is defined as the extent to which individuals 'scan for opportunities, show initiative, take actions, and persevere until they reach closure by bringing about change' (Bateman & Crant, 1993). This can also be referred as subjective capabilities and were commonly displayed by the INV entrepreneurs' personal traits and capabilities. INV entrepreneurs were found to enact entrepreneurial oriented behaviours by engendering global vision, proactiveness, risk-taking and customer-orientation from inception (Rialp et al., 2005). Other subjective attributes were global mindset of the founder. Global mindset refers to the INV founder's proactiveness and vision towards leading and managing their new ventures on international markets (Haveston et al., 2000).

Similarly, in their theoretical paper, Weerawardena et al. (2007) posit that INV founder-managers possess certain dynamic attributes that drive the capability building process of the firm to develop knowledge intensive products for competitive advantage (p. 299). They propose that founder-managers possess 'networking capabilities' for knowledge and resource acquisition and international 'market focused learning capabilities' to better position their firm in niche markets. Market-focused learning capability is defined 'as the capacity of the firm, relative to its competitors, to acquire, disseminate, learn and integrate market information to create value activities' (Weerawardena et al., 2007).

Attributes of INV firm

At firm level, three key attributes (see Table 1) emerge as the basis for competitive advantage for INVs. Firstly, studies agree that INVs position themselves on product differentiation through creation of unique intangible knowledge-intensive offerings, facilitated by technological innovations. Second, these firms target and deliver to global niche customer segments, and in doing so develop and maintain close working relationships with their international customers (McDougall et al., 1994; Madsen & Servais, 1997).

From the findings (See Table 1), it can be argued that the development of competitive advantage is developed within the internal boundaries of the firm; in particular profitability and growth should be understood in terms of the firm's possession and development of unique and idiosyncratic resources (Penrose, 1959). Such resources may include the firm's 'human resources, capabilities, competencies, orientations, stock of knowledge and technology, knowledge management procedures, and human capital' (Etemad, 2004). Knowledge, and the capability to create and utilise it, is a prime source of sustainable competitive advantage for firms. Many researchers have drawn on the RBV, the Knowledge Based View (Autio & Burgel, 1999; Sapienza & Autio, 2000; Autio et al., 2000; Kuivalainen & Bell, 2004) and more recently, the Dynamic Capabilities perspective to explain competitive advantage in INVs (Zucchella, 2005; Weerawardena et al., 2007).

Dynamic Capabilities and Resource based view of the firm

The RBV suggests that firms in the same industry perform differently because they differ in their resources and capabilities. As much of the RBV literature focuses on static firm-specific resources, the KBV extends the RBV to examine those resources that are non-stationary and more dynamic (Kuivalainen & Bell, 2004). The KBV overlaps with the Dynamic Capabilities view (Teece et al., 1997). The KBV and Dynamic Capabilities perspective have been used interchangeably in the literature, since both approaches focus on knowledge inventories, capabilities and resources as sources of competitive advantage and firm growth. However, the Dynamic Capabilities view, whilst implicitly suggesting the need to distinguish capabilities from resources, stresses the importance of the dynamic processes of capability building in gaining competitive advantage (Weerawardena et al., 2007). In contrast to the RBV, the Dynamic Capabilities theory posits that the firm needs to develop new capabilities to identify opportunities and to respond quickly to them. The Dynamic Capabilities view considers firms as active generators of competitive resources by which managers 'integrate, build, and reconfigure internal and external competencies to address rapidly changing environments' (Teece, et al, 1997).

The role of the entrepreneur in Dynamic Capabilities perspective of firm

The Dynamic Capabilities view assigns a prominent role to the entrepreneurial decision-makers in the formulation and implementation of competitive strategy (Weerawardena et al., 2007). Dynamic Capabilities are also developed consciously and systematically by the wilful choices and actions of the firm's strategic leaders (Grant, 1991; Teece et al., 1997; Weerdeena et al., 2007). Following the logic of the RBV (Barney, 1991), Castanias and Helfat (2001) suggest that managerial resources, defined as the skills and abilities of managers, can be difficult to replicate

quickly. Managerial skill sets, combined with other firm assets and capabilities, jointly have the potential to generate rents and can be 'key' contributors to the entire bundle of firm's resources that enable some firms to generate rents more than others (Castanias & Helfat, 2001).

New firms can internationalise successfully due the entrepreneurs' specific capabilities (Oviatt & McDougall, 1994; Knight & Cavusgil, 1996). Entrepreneurial orientated firms display capabilities like innovation, and proactively seeking opportunities to recognise opportunities (Lumpkin & Dess, 1996). What one conceives of entrepreneurship is a process, not just a status, and as such it requires dynamic attributes (Zucchella et al., 2005). It requires the entrepreneur to develop the organisation through capabilities reconfiguration (Montealegre, 2002) - the capacity of the founder-manager to mobilise resources and develop and reconfigure Dynamic Capabilities in changing business environments for firm performance (Zucchella et al., 2005; Weerawardena et al., 2007). Weeredeena et al., (2007) positioned the owner-manager central to the development of dynamic capability for knowledge-intensive firms.

Building on the above arguments, this paper argues that the dynamic capability perspective and the RBV can explain how INVs in a low technology sector develop competitive advantage and also underpin those strategic attributes that enable them to do so. Incorporating the Dynamic Capabilities view enables us to capture the development of capabilities that facilitates the INVs to acquire competitive advantage. While the Dynamic Capabilities enables us to capture the role of knowledge in creating competitive advantage, this research examines the entrepreneur prior knowledge and capabilities (objective and subjective) in building firm capabilities in terms of accessing, developing, combining and integrating resources inside and outside the firm for competitive advantage.

RESEARCH METHODOLOGY

Case Study Approach

As the present study aims at answering 'how' questions relating to a contemporary set of events, including dynamic processes, qualitative research using case study methodology was selected with Critical Incident Technique (CIT) as the main tool for data analysis. Many authors (Chetty, 1996; Ghauri, 2004; Fletcher, 2009) have promoted the use of the case method in research on international business research. Its strength lies in facilitating the study of the internationalisation process from several perspectives and therefore facilitating a more thorough analysis of each firm than is possible in survey research. If the research problem necessitates rich, deep information, then a small set of case studies is appropriate; and, providing that generalizability is not assumed, meaningful findings can still result.

Critical Incident Technique

For case data analysis, many authors (Sinkovics et al., 2008; Ghauri & Firth, 2009) have advocated the use of formalised procedures for the analysis and interpretation of qualitative interview case data. To this end, critical incident technique was used together with replication logic to enrich the understanding of the concept and extend the narrative quality of the data. CIT refers to "a set of procedures for collecting direct observations of human behaviour in such a

way as to facilitate their potential usefulness in solving practical problems." CIT focuses on capturing process through a series of discrete events and has been effective for exploring the dynamics of processes, the delivery of and acting on that information and the outcome of the event. The interview technique has been the main procedure for gathering qualitative data for CIT. Using critical incidents provide a better understanding of how Dynamic Capabilities develop and manifested captured in the case firms. Further, CIT lends itself to small sample sizes (Neupart et al., 2006) which also suits the number of cases used in the study as discussed below.

Case Selection

The choice of three cases was made based on conceptual grounds, rather than representative grounds (Miles & Huberman, 1994). The aim was to identify meaningful venture knowledge, capabilities and other attributes that can explain help each case firm's international competitiveness. Random selection was neither necessary nor desirable, and hence theoretical sampling was used. Theoretical sampling occurs when cases chosen are likely to replicate or extend the emergent theory. Following this logic, Miles and Huberman's (1994) four parameters (setting, actors, events, and processes), were used as the case sampling frame (See Table 2). This sampling technique ensured that cases fit into conceptual categories and were seen to enhance their explanatory power of case data.

TABLE 2. SAMPLING PARAMETERS FOR CASE COMPANIES

Sampling Parameters	Choices
Settings	Irish seafood INVs
Actors	Founders /Managing Directors and Industry agency officials
Events	Initial and subsequent international foreign market entry and market development
Processes	New venture and entrepreneurial processes; resource and capability acquisition and building processes; knowledge acquisition and management

(Adapted from Miles and Huberman, 1994)

The case companies satisfied the operational definition of International new ventures (Knight & Cavusgil, 1996,). Two of the case firms derived 99% of their revenues from exports within the first year of trading. All founded by the current owner-managing entrepreneurs, the case firms were similar in basic firm characteristics in terms of size (between 1 and 80 employees), turnover (between 5-10 million euros) and international market presence (all operated in in least 10 foreign markets).

Data Collection and Analysis

In preparing for the case analysis, industry reports, secondary documentation, and the web sites of Irish seafood firms and of support/research associations were reviewed. For each case company five to seven on-site interviews were conducted with the managing directors/owners. Qualitative insights were obtained through interview quotations and case description. However,

as to capture empirically the capability building processes of the founders, CIT was used. When respondents identified specific events relating to the research questions they were asked to recount of the 'critical incident' and to help to understand its nature and consequences. A sample of critical incidents selected to exemplify data to describe how capabilities were captured through the experiences of the case founders and also interviews. For the incidents where BIM executives were worked with case firms, two executives were interviewed involved in the incident for two of the case firms. This allowed for triangulation of the data for about percent of the incidents specific to research objective seventy percent. This also helped minimize retrospective bias of the main interviewee.

CASE SUMMARIES

Case A

Strategically located near its natural resources on the south coast of Ireland, Case A was founded by current Managing Director (MD)/owner, who co-founded the company in 1987 with five others, who have since left. The firm is one of the four largest shellfish producers in Ireland, with mussels accounting for 80% of its production. The company began as an export start-up due as the market was international and not domestic. The company operates in a niche seafood segment and supplies to three customer groups: retailers, catering distributors and food processors located throughout Europe, the USA, Asia and Japan. The company has a workforce of 40, with an annual turnover has grown to €4 million in 2007, all of which is exported since inception.

Case B

Situated on the West coast of Ireland, Company A is a one-man operation, employs four low-skilled persons and has an annual turnover of 2 million Euros (2007), 99% of which is exported. The company specialises in producing and exporting live seafood to customers in Europe, Asia and the Middle East. A marine biologist by profession, the founding owner and MD established the company in 1998 in direct response to the no home demand for his product and the global niche demand in the higher priced end of the luxury seafood market. The key buyers of his product are restaurants, hotel chains and distributors which the company deals directly with bypassing any intermediaries in the sales process.

Case C

Founded in 1987 by two local fishermen, Case C is a privately owned small seafood processing company, situated in a small fishing town on the south-west coastal tip of Ireland. The company was set up initially to export as at the time a home market had existed for their crab product. The firm's core business activity is in the processing of crab products and it is the largest crab processor in the region and one of the largest in the country. It sells to both business and consumer markets at home and abroad, with 50% of sales accounting for exports in 2007. The firm has grown rapidly since its inception in 1988, with a turnover of €80,000 in 1987 increasing to approximately €6 million in 2006, giving an average growth of almost twenty five percent per

annum. In 2004, the firm was awarded the Irish seafood exporter of the year award by the Irish Exporter's Association.

FINDINGS AND DISCUSSION

This research seeks to gain exploratory insights into how low-technology INVs acquire and develop competitive advantage and the strategic attributes underpinning successful and rapid internationalisation. In accordance with the literature review, the case findings are organised and discussed under the following headings: (1) the founder-manager's prior knowledge base and capabilities; and (2) the unique resources and capabilities of the firm. This section leads to a conceptual framework (Figure 1) proposed as a basis for future research for exploring Dynamic Capabilities in INVs in both high- and low-tech sectors.

The Founder-Manager's Prior Knowledge and Capabilities

Objective Capabilities: Generalist Experience

None of the case entrepreneurs possessed prior international experience when forming their export ventures. The motivation for starting the new venture was primarily market conditions coupled with large foreign demand. Prior to forming the INV, two of the three founders possessed a broad range of technical, start-up and marketing experience from managing previous local ventures. In relation to technical knowledge, an understanding of the development and production of the product was critical for the founders at start-up. Prior to starting-up, Case B founder was the commercial director of an R&D venture in the breeding and production of shellfish products. He says: "*I have worked in it from the breeding point of view to the farming point of view to the marketing point of view ... and am one of the few people in the country that has the experience of breeding shellfish, I take it from sperm and egg to the table literally ... That has been a help to me as well.*"

Case A and C, both had several years' technical experience from working in the sector with seafood products. Prior to start up, Case A founder was already an experienced businessman, owning a retail clothing business. He had been involved in setting up salmon hatcheries a few years previously. This was a sideline venture to his main clothing business at the time, but he still had a passion for seafood, he said "*I have also wanted to farm the sea since a young lad.*"

Notwithstanding the importance of international work experience for INVs, none of the founder-managers worked abroad prior to start-up; however, they possessed certain types of experiential knowledge at start-up that was useful to their internationalization process. Two out of the three case firm founders at start up were typically generalists (Oviatt & McDougall, 1994; McDougall et al., 2003), with a broad range of technical, marketing and start-up experience. In the case of firm C, which withdrew from internationalisation after its first year of start-up, the findings suggest that the absence of such generalist experiential knowledge in terms of marketing and start-up experience contributed to its initial failure. The founder says "*we were simple fishermen; we were naive: new to the game.*"

When the firm re-internationalized several years later, the founders, having acquired generalist

experience of operating a domestic venture, proved to be extremely successful. The contrasting stages of internationalization in this one case reinforce the argument that case founders are required to be 'generalists' rather than 'specialists' for successful internationalization.

This research concludes that the possession of generalist experience by the founder at start-up is a strategic benefit (a critical success factor) to the internationalization of the new venture (McDougall, et al, 2003) the 'generalist' experience of the founder is an important objective capability to build the international competitiveness of the new venture.

Subjective Capabilities: Internationally Proactive Networkers & Market-focused Learners

Two subjective capabilities emerge across the case evidence: proactive networking capabilities and market-focused learning capabilities. Table 3 presents interview quotations from case founders, displaying their highly focused on learning about foreign markets. A seafood industry executive who worked with the case firms says: "The product, you need the drive to develop, work and travel a lot, and they need to be out there. It's a small family network of firms, it's very high contact business ... it's just seafood; it's the passion with seafood."

A sample of incidents (Table 3) illustrates their capacity of the case founders to be highly proactive networkers across borders. The incidents demonstrate how the founders built, leveraged and mobilised their international networks to acquire the foreign market knowledge, know-how, technological capabilities, finance and resources that they did not possess.

TABLE 3. SUBJECTIVE CAPABILITY: MARKET-FOCUSED LEARNERS

Case A	Case B	Case C
'I want to be one step ahead of the market, anticipating customer needs.'	'If I see a market I want to get into, I will get my head around it and I'll find the information.'	'Now they are hungry to learn hungry to get out there.'
You see somebody and you say "I can work with that person", and you chase them.'	'Every day you are faced with a challenge. If there is an end user out there I will make as many calls as I have to…'	'If you don't have vision, if you don't know where you're going … you'll never get there.'
'For instance I am trying to develop four markets; I am working with Japan, as a development one.'	'Anything that works, you make it work yourself ...'	'At the moment turnover is 30% our export sales … I can tell you now our focus now is through probably getting our turnover to least half foreign sales in two or three years.'

TABLE 4. SUBJECTIVE CAPABILITY:
SAMPLE OF EVENTS ILLUSTRATING THE CASE FOUNDERS'
MOBILIZATION OF NETWORK TIES FOR KNOWLEDGE AND RESOURCES

Case A

Year	Event	Description of event	Outcome
1992-1995	Product development and customer involvement in product development	Via a business contact of Founder, latter developed partnership with French company in final stages of new product development.	Knowledge resources via product collaboration; foreign market knowledge
2000	Global fact finding mission:	Faced with imminent closure due to toxins in raw material, he personally visited his international contacts in New Zealand, Canada, Chile, and Denmark in search of new product ideas to get him out of imminent firm closure.	foreign market knowledge;
2000	International Retail Product Partnership- informal business tie	In 2000, founder approached French industry tie of his to collaborate in retail product agreement to supply him retail product for French market under the French client's brand name.	New market segment
2002	Acquisition of knowledge capability in NPD via business tie	In 2002, while visiting a supplier in Canada, founder was referred to new product development contact from Scotland, Bob. He worked with founder for year to develop a new product range. Bob now works as agent for Case A in UK.	NPD knowledge capabilities
2003-2004	Acquire knowledge capability via Norwegian collaboration	Founder pursued business partnership for technological transfer with Norwegian salmon manufacturer met at a trade show in 2001.	Technological capabilities in production

Case B

2000	R&D Collaboration	Case B founder collaborated in two R&D project with Irish university & BIM for lowering mortality of product and improving transportation of live animals for the industry .	R&D leading to successful long distance transport; financed and managed by BIM
2000	Foreign market knowledge in Chinese markets	Garvey pursued opportunities in China when alerted by industry newsletter he proceeded to contact his Irish ties working in catering sector in Beijing for knowledge of the Chinese seafood market China.	Foreign market knowledge

Case C

1999	Canadian crab machine via local exporter	Through a local exporting firm and friend of founder's, Firm sourced machinery in Canada, which would allow Firm enter new product markets.	Technological capabilities
2001-2001	Entry into France via BIM Paris	Case C contacted Seafood agency to facilitate sales acquisition with a large French client and to subsequently assist with operational market knowledge for French client.	Exchange partner; knowledge capabilities
2004	Identification of Spanish clients	The founder contacted the Spanish BIM executive he met at the Brussels trade show in 2004. Within a few weeks the executive in Madrid lined up three big customers.	foreign market knowledge and capabilities

Proactive Networking Capability

The findings suggest that a key factor is the founders' capability to exploit network ties for accessing and developing critical resources. The evidence supports the founders' high use of networks to compensate for a lack of financial and knowledge capabilities as well as leverage resources for knowledge of opportunities (Loane & Bell, 2008). The founders of INVs have utilised these network relationships to obtain information, resources, capabilities and the access to exchange partners for market entry required for rapid internationalization (Dana et al., 1999). The case findings suggest that the external resources and capabilities mobilised by an entrepreneur have an important impact on the ability to enter export markets (Westhead et al., 2001). Thus, to some degree, the findings support the assertion that internationalization depends not only on an organisation's set of network relationships but also on the entrepreneurs' capabilities to exploit such networks (Zucchella et al., 2005).

The unique ability of the founder to mobilise and use networks for advantage constitutes a strategic capability (Teece et al, 1997; Sullivan Mort et al., 2006). This research supports the assertion that leveraging these capabilities and building a strategy through knowledge-based assets can explain the international growth for the firm (Kuivalainen & Bell, 2004). This capability cannot be boxed; nor is it static. The ability to exploit networks is a dynamic one: if done well, it constitutes a strategic dynamic capability for these firms (Sullivan Mort and Weerawardena, 2006). Given the limited resource base and highly competitive market, these firms see it as essential to mobilise networks for information, knowledge and resources and, where there is potential, a strategic collaboration as witnessed in the case evidence.

This research suggests that the extent to which these network resources are mobilised very much depends on the entrepreneur's ability to exploit and pursue them. This finding supports and builds on the assumption that the founder possesses a "constellation of skills and competencies." This finding is important, as entrepreneurs use their networks as a means to overcome resource and knowledge deficiencies. This study concludes that INV entrepreneurs can possess the

dynamic capability to progressively seek resources and build capabilities using their external ties, as their limited resource base necessitates.

Market-focused Learning Capability

Similarly, as proactive networkers for resources and knowledge, the case owner-managers emerge as highly market-focused learners who actively acquire and respond to market information on new markets and customers. Market focused-learners also follow a market-orientated path, defined as the acquisition, dissemination and responsiveness of market intelligence to serve customer needs for value creation another source of competitiveness. Market-orientated behaviour displayed by the case founders render their ventures more conducive to sustaining competitive advantage for foreign market entry and growth (Evers, 2009). Through their shift in focus from low value to high value end products (via product diversification) the case firms were capable of unlearning and relearning in responding to market opportunities. These findings concur with the view that a market-focused learning capability of the INV founders is important for developing competitive advantage on international markets (Weerawardena et al., 2007).

Unique firm resources and capabilities

A Competitive Market Offering via Unique Resources and Capabilities

The evidence shows that the resources and capabilities enabled the case firms to deliver a value-added product and enabled them to respond to and adapt quickly to changes and developments in their market environments.

First, findings show that the case firms possess unique tangible resources such as location and physical location where raw materials are sourced and produced. Secondly, the intangible assets such as knowledge acquired by the founders' commitment to actively researching and developing new products and developing R&D capabilities in logistics and production enabled product diversification and the ability to deliver to distant markets. The case firms embraced strong customer orientation and relationship-building strategies which led to more competitive and sustainable market offering. The findings on each of these core activities is presented and analysed below.

Unique marine coastal location: For the three case firms, unique coastal location emerges as is a firm-specific advantage, given the necessity to be located near the raw material and in a suitable marine environment from which the product is sourced. When discussing his competitiveness abroad and ability to win clients, Case B founder says: *"My grade is the top ... I have Grade A waters certified by the Union (EU) and that is a very important selling point for me. Anywhere in the world ... so I am green, organic ... that makes it easier for me to say in Kualalumpour wherever it is to say, "I can guarantee you top class Grade A" ... Whatever it is."*

For Case B, the waters in his Bay can add value to his products. He says: *"My waters would act as purifier ... I might buy in stuff from grade B waters and then upgrade them to grade A with my waters."*

Also in terms of supply of raw material, all firms have unlimited supply via possession of, and close proximity to, locational-based resources. The locational resource has also been a key selling point and indicator of the quality and freshness of their product as perceived by foreign clients; it is vital to their brand reputation. According to the Case C founder, the firm needs to be located close to fishing grounds; otherwise, he says: *"What reason would we have to be here, located in an extremely remote rural, coastal area inaccessible to [the] main commercial centres?"*

He emphasises that location and access to raw material is a key selling point on international markets: *"Quality is a big one ... We have a quite a resource here, which is very important… And further emphasises the criticality of this resource, by saying: 'If we lose our raw material source, we are finished."*

The case findings suggest that the case firms possess unique tangible resources (physical location) that allow them to acquire competitiveness abroad (Barney, 1991). This resource is unique and difficult to imitate, and it provides them not only with access to raw materials but also with a clean, green image of producing their products in their natural marine environment. For these INV seafood firms, the fact that the unique physical marine location is strategically managed by the founders is shown throughout the evidence.

R&D in logistics and NDP: The case firms show a commitment to adding value to the core tangible product through their own knowledge and skills and leading and developing the R&D capabilities across three operational areas: (1) R&D in technology for international logistics; (2) R&D in new product development; and (3) advanced production technologies which will be discussed in next section in the context on the firms' product diversification strategies.

Firstly, Case B delivers fresh, live products and must ensure that the product is intact on arrival. Its founder had been collaborating with Trinity College, Dublin on two R&D projects related to the technology for the transportation of live animals over long distances to places such as Hong Kong, China and Dubai (see Table 4 also). That research has benefited Case B significantly by enabling product to be delivered to China, Dubai, etc., live and intact to the client. He says: *"So technology has played a role ... and I am currently involved in a (second) R&D project with TCD."* *"China is an extremely difficult market to penetrate in terms of logistics ... I know China very well having researched and worked over there."*

Case B founder says: *"I was able to land live produce from the bay to Beijing, which hadn't been done before 'Having worked on research I am able to ensure that stuff can get out there. Some of it has come from R&D innovation."*

Second, despite the traditional low-tech nature of these firms, the firms have recognised the criticality of ensuring they are hands-on in R&D on food quality and new product development. In terms of product development, it is important that Case A and C have had in their own R&D units. The changing and evolving nature of the seafood processing market has meant that these firms have had to be very active in product innovation and improvement. They continue to look for new ways to maintain product quality and freshness over long distances and also developing new variations of their product. Case A founder says: *"Commodity or not, quality and reputation*

are critical to survive in the exporting business." Case C had acquired substantial technical product and production know-how which allowed them develop a market in Ireland for their product where none previously existed. They invested in an R&D unit for developing new products and improving current ones.

Expertise and specialised product knowledge have allowed them to gain competitive edge in the area of product shelf life. He says: *"Pasteurisation is a trade secret. And I asked people about it and then worked back in R&D department ... trial and error, and picking people's brains. People are wondering how am I getting thirty days shelf life on crab at the moment, that's a trade secret ... so going to trade shows has increased the technical and product knowledge."*

Therefore, case firms all offer a product in which unique knowledge resources are developed and embedded to provide added value. They have added value to their product by proactively engaging in R&D activities to improve the quality of their product (Buckley & Casson, 1976; Kimuara, 1989). This research supports extant research asserting that INVs compete on products differentiated with regard to quality and value created through innovative technology and product design (Rennie, 1993). Such resources and capabilities are manifested in the value-added products and support the idea that quality is a source of competitive advantage in INVs (McKinsey & Co., 1993; Rennie, 1993). Product quality and product uniqueness can be positively related to international competitiveness (Rennie, 1993). In addition to unique physical location, the core resources of the case firm are also intangible with competitive advantage is derived from unique knowledge possessed by the intellectual and human capital of the firm. This underlines the importance of the Dynamic Capabilities view of the firm (Kogut & Zander, 1992; Grant, 1996) for these INVs, despite their traditional low tech nature.

Adaptability via Product diversification

All three firms have engaged in product diversification through extending product lines, adding new ones, and developing new customer markets by targeting the downstream client in retail. Product diversification has enabled international market growth and has added value to the firms as a whole and has enabled them to penetrate and expand into new foreign markets. Identification and acquisition of advanced production technologies by founders enabled the firm to diversify the product portfolio to capture lucrative and more value added retail markets for growth. Case A was able to develop to new products and move into new global customer segments by using production technologies in food processing with the result of an increased turnover from 1 million Euros in 1995 to 4 million Euros in 2003. The founder says: *"Our whole business has shifted from fresh ... since then and our growth from 1 million up has been with these added value products."* One seafood industry support agency executive says: *"(through) Product diversification and constant work, they have moved away from what they started with ... by diversifying."*

Case C also diversified into offering a more value-added product to retailers abroad. New machinery facilitated the production of the wider variety of product that has enabled them to become more effective abroad. The founder realised that extending the product to offer a greater variety of quality shellfish would make it more attractive on foreign markets. It extended its product lines to be able to enter foreign markets such as France, Spain and Greece.

What has emerged across the case material is that product diversification is a core part of their internationalization strategy. The product diversification strategies impacted market expansion and penetration through extending product lines, adding new ones, and developing new customer markets by targeting the downstream client of the retail chains. Product diversification demonstrates a strategic response to market intelligence acquired for new market development and new customer channels (Teece, 2000; Nooteboom, 2002). Product diversification into more value-added products has led it to extend its foreign customer base and hence grow internationally. Knight et al., (2001) found that advanced production in technologies enabled rapid internationalisation to their larger seafood exporters.

The findings support Sharma and Blomstermo (2003), concluding that INVs improvise, adapt and show a willingness to learn the needs of the individual buyers and the local distribution channels. Adaptability is of strategic importance, as these firms can be hampered by constraints and thus may require adaptable routines to serve diverse and rigid foreign markets (Sharma & Blomstermo, 2003). This research concludes that international small firms have flexibility to adapt to rapidly external market conditions and circumstances (Sharma & Blomstermo, 2003; Rialp et al., 2005). That these firms can adapt and renew themselves in international markets and for survival renders adaptability as a dynamic capability (Teece et al, 1997) and a strategic attribute of the case firms (See Figure 1).

Customer orientation

The findings show that customer orientation and relationship building are part of their core competency and competitive strategy in all three case firms. Customer-orientated strategy, emphasising customer needs, satisfaction and service, is a competitive attribute and adds value to the firm's market offering in the eyes of customers. All the case firms have developed close relationships and, for two of the case firms (Case A and Case C), strategic international buyer-supplier partnerships have been an important part of relationship-building:

> Case A founder has developed long-term relationships with his agents, but at the same time, he says: *"I always try to meet the customer ...I take ownership of the market. I can't rely on agents. I want to know the user of my product ... If they don't like it, I ring them and ask what was bad about my product ... I've a very personal relationship with the customer."*

> Case C founder sums up what it means to be a customer-oriented business and says that it is a critical success factor for his business. He says: *"Your success or failure in sales depends on the relationship you build with your customers, can you deliver, can you deliver what he wants, can you deliver on time, and can you deliver to the standard?"*

Customer relationship-building and orientation is a well-founded capability in the INV literature (Jolly et al., 1992; Larimo, 2001; Zucchella et al., 2005; Aspelund & Moen, 2007). Customer service is also identified as a source of differentiation for the case firms. This research concludes that the INVs' customer orientation, promoted by the founders' close relationship-building and commitment to client satisfaction, is part of the overall market offering. This research also

concludes that the theoretical foundations of these firms lie in the RBV and KBV, given the intangible nature of the founders' relationship- building capabilities (See Figure 1).
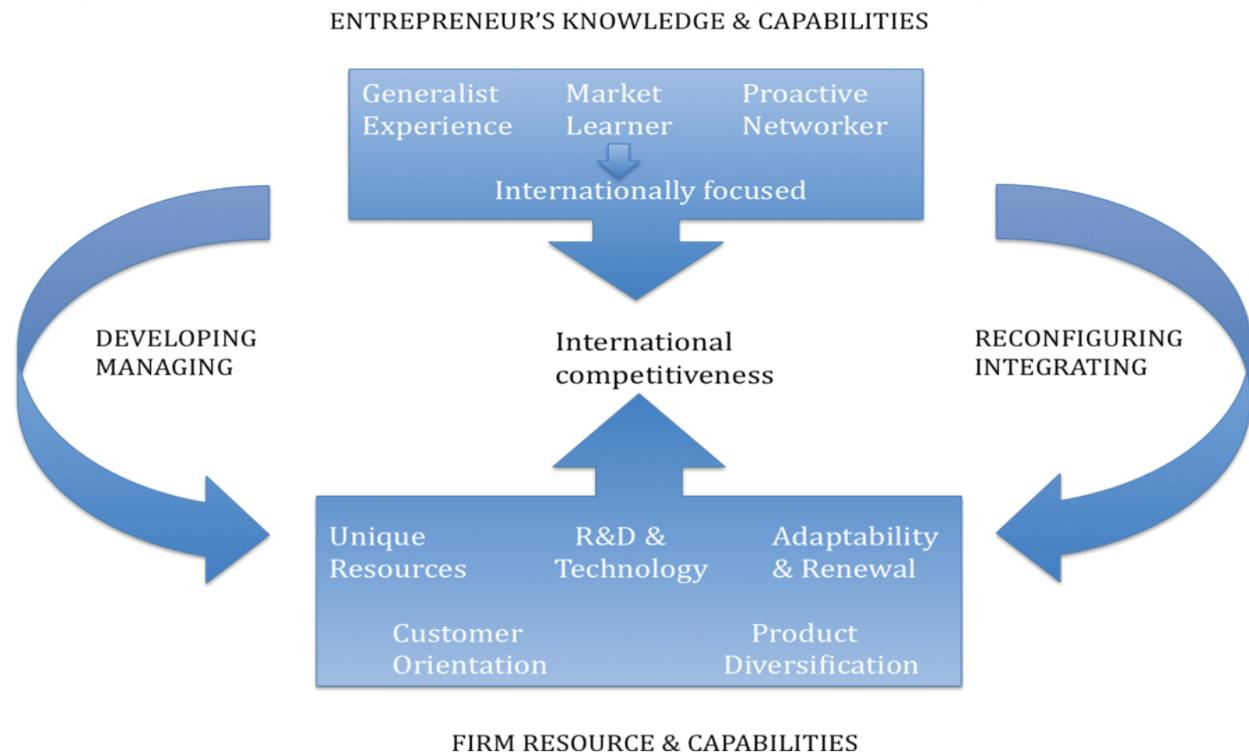
ENTREPRENEUR'S KNOWLEDGE & CAPABILITIES

FIGURE 1. Developing Dynamic Capabilities for Competitive Advantage in International New Ventures Conceptual Framework

DISCUSSION AND CONCLUSION

This study set out to explore how INVs develop competitive advantage and their strategic attributes which enabled them to attain this competitiveness on international markets. This research supports both the Dynamic Capabilities and resource-based view (RBV) of firm internationalization, where the entrepreneur is viewed as the central repository of knowledge or resources (Harveston & Davies, 2000; Weerawardenna, et al., 2007). The Dynamic Capabilities theory provides interesting insights into how low technology export ventures develop and sustain competitiveness in foreign markets. This study proposes a conceptual research framework (Figure 1) for further testing on INVs from both high- and low-technology sectors.

For the studied seafood firms, their unique resources (physical location) and their intangible resources and capabilities (R&D, technological capabilities and customer orientated strategies) allow them to acquire competitiveness abroad (Barney, 1991; Grant, 1996). The internationalising firms investigated in this research were found to mobilise unique, interdependent resource stocks (Reid, 1983). The founders emerge as a key source of knowledge and capabilities through strategically managing and developing firm capabilities for sustainable competitive advantage in very turbulent, demanding and competitive foreign markets. As shown in Figure 1, this research suggests that INV entrepreneurs-managers are central in the strategic management of new ventures. They can appropriately adapt, integrate, and re-configure internal

and external organisational skills, resources, and functional competencies to develop competitive advantage and respond to changing environments (Pierce et al., 2001).

The evidence shows that the value-added stems from each of the founders' management of unique tangible and intangible resources of the firm. First, findings show that the case firms possess unique tangible resources such as location and physical environment where raw materials and product are sourced and produced. Secondly, the intangible assets such as knowledge acquired by the founders' commitment to actively researching and developing new products, logistics and production technologies as well as the aggressive adoption of strong customer orientation and relationship-building strategies with exchange partners render a more competitive and sustainable international market offering.

The case firms have also demonstrated their high capability to adapt to foreign markets for competitive advantage. Adaptability is shown by the founders' capabilities to innovate via adoption of product diversification strategies for growth and expansion and also to quickly adapt to rigid customer requirements in foreign markets. The Dynamic Capabilities view of the firm can also help explain the INV's adaptability and flexibility in managing changing and diverse markets, under the leadership and management of their founder-managers.

The case entrepreneurs' objective and subjective capabilities embedded within the firm helped mobilise external networks for market, operational capabilities and finance. This supports the Dynamic Capabilities perspective (Teece et al., 1997) in an entrepreneurship-networking context. This also further strengthens the idea that international entrepreneurship is concerned with dynamic pursuit for resources and using networks for international development irrespective of sector. The greater the founder's capability to mobilize networks, the greater is the access to resources and capabilities.

Limitations and further research

The nature of the research merits qualitative research as the chosen methodology. However, this study is not without its limitations. This study has been limited to a single industry sector, and to respondent companies from just one country and one sector – Ireland and seafood respectively. Using the Dynamic Capabilities perspective, the conceptual framework (Figure 1) in this study can offer a basis for future studies to explore across diverse empirical high and low-tech industry contexts.

MANAGERIAL IMPLICATIONS

A number of implications have emerged for policy makers and managers from this study. Knowledge has always been considered as more relevant to high-tech sectors of the economy, and to science-based activities, especially in respect of ICT and biotechnology (Kreinsen et al., 2003). Recent debate has shifted to how knowledge is an increasingly important resource for low- and medium-technology sectors (LMTs), to gain competitive advantage, as illustrated by the case firms. Similarly, researchers have argued that the most basic mistake in high-tech models is the tendency to identify R&D activities with technology based industries, and hence to see high-level R&D activities as the sole standard bearers of the knowledge economy. Promoting

'low tech INVs is therefore a major challenge for national government policies aimed at driving innovation and enterprise research targeted at rural and peripherally located internationalising enterprises. Policy makers should give greater priority to the role of knowledge creation and development as competitive resources for LMT sectors.

Finally, this study would encourage small firms to draw up a capabilities portfolio of the business; and group their intangible assets into codifiable categories; and assess their current and potential use, especially in terms of their capacity to add value to the business. A capabilities management framework would facilitate the creation and development of new knowledge and capabilities in relevant areas of the business, and would also facilitate the changing and modifying of knowledge. Such an organising framework would also provide a co-ordinated approach to managing these strategic resources. This framework would also require managers to recognise the dynamic and evolutionary nature of knowledge and capabilities as a means of responding effectively to their international markets.

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THE PERCEPTIONS OF BUSINESS STUDENTS REGARDING FACULTY CONSIDERATION

Randall P. Bandura, Frostburg State University
rbandura@frostburg.edu

Paul R. Lyons, Frostburg State University
plyons@frostburg.edu

ABSTRACT

Recent attention has been given to classroom incivilities reflecting student behavior, however, instructor care and respect toward students has received little attention. We examine perceptions of two groups (undergraduate accounting students, MBA students) regarding instructor care and respect. College instructor care and respect toward students is clarified by (1) explaining such behavior and the lack of it; (2) providing information from learner samples; (3) exploring, [a] caring, respectful behaviors, and [b] uncaring, disrespectful behaviors; and (4) specifying instructor behaviors which may convey that students are respected and cared about, and which help build positive classroom environments.

INTRODUCTION

This paper is about the care and respect college instructors demonstrate towards students in their regular classroom interactions. When students perceive that they are not treated with care and respect there may be untoward consequences, and as faculty, we should have some knowledge and understanding of those consequences for student learning and for the quality of our relationships with our students. Until recently, this topic was not given much attention in the literature of higher education.

Recent research shows that the topic is important in the minds of students, if not instructors, as a substantial proportion of students can readily report instances where they were treated in an uncaring and/or disrespectful manner by their instructor. The whole matter of care and respect is not a one-way issue as there are many examples of student behavior that clearly demonstrates a level of incivility towards instructors.

As instructors, we need to do the best job possible in terms of our skills, knowledge, and dispositions to help our students learn and grow. Demonstration of care and respect falls into the last category - dispositions. Treating students well is the right thing to do. In a practical and self-interest sense, instructors have to demonstrate positive behavior toward students because, in most colleges and universities, the students rate the instructors' performance; students "vote with their

feet and computer mice," and as consumers, our students have many opportunities to seek education from a variety of sources. With YouTube, Twitter, texting, Facebook, and other digital social connections, students can spread the word quickly and widely that professor X is perceived as having some problems with her/his students.

In this paper we will clarify the issue of care and respect of college instructors toward students by: (1) defining and explaining the behavior that may demonstrate caring and respectful behavior as well as the lack of that behavior; (2) providing data and information from two distinct samples of adult learners (undergraduate accounting students, MBA students); (3) exploring and categorizing the various forms of behavior that students regarded as, [a] caring and respectful, as well as, [b]) uncaring and disrespectful; and finally (4) a specification of several actions and behaviors in which instructors may engage that send the message to students that they are respected and cared about, and which also help in building positive classroom environments.

BACKGROUND

The study reported in this article began a few years ago. A colleague received an email from a student ten weeks into a semester course in which the student, a woman who was returning to collegiate schooling after a gap in time of several years, asked him to "please not give up on her" in the course. In part, her anxiety about her performance, her trepidation about mastering the course content, and her ability to keep up, caused her to believe that this behavior might stimulate the instructor to give up on her and her learning. The instructor, (see Hawk and Lyons, 2008) anticipating that this student already thought she had been given up on, talked directly with her and asked how she felt she was progressing in the course. The student told him that what he was doing in the course to help her and encourage her learning was just fine, well beyond her expectations, yet she was anxious. When asked if she had been "given up on" in past courses, her response was a resounding "yes." She said she could report several different instances in which such perceptions were experienced and reinforced.

This somewhat unexpected response gave rise to an interest in exploring the issue of students perceiving that they may have been given up on by an instructor and what consequences such perception had for the student. We believe the information provided in this paper serves as an alarm for instructors because it reveals that our students are paying strict attention in terms of their perceptions and expectations of instructor behavior. The questions asked of samples of students that bring this research to life are:

1. Have you ever had the feeling that a faculty member or instructor had "given up" on you and your learning in a course?
2. What did the faculty member or instructor do or not do to give you that feeling?
3. What did you do as a result of that feeling or perception?
4. What are ways that a faculty member or instructor can communicate to you that he/she has not given up on his/her commitment to you and your learning in a course?

In later discussions with the students, those who reported feeling as though they had been given up on at some point in their academic career almost unanimously attributed the giving up by their instructors to a lack of caring and respect for the student and the student's learning on the part of their instructors. While most instructors would take it for granted that they and their peers, in

general, do care for and respect students, the proportion of students who report a lack of care and/or respect is of a magnitude to demand our attention. Failure to demonstrate care and respect for students may have several undesirable consequences such as diminished student effort and commitment to academic work likely matched with poor performance, negative ratings of instructor performance, damaged reputation of an academic program of study and, depending on the severity of the perceived lack of respect or care, attrition resulting from student withdrawal from a program of study. Research completed by Buttner (2004) documented a large number of undesirable outcomes.

Given the student focus on respect and care, it seems reasonable to explore the respect and care literature as it may inform us about the dominant theme in the student responses. The literature is reviewed next, followed by the data and information provided by students to the four questions listed above.

Caring for Students In the Pedagogical Sense

There is little information in the literatures of the business disciplines, education, psychology, or philosophy that explicitly addresses the matter of caring in the teaching-learning context, although there are some exceptions. In their study, Hawk & Lyons (2008) found only two citations dealing with ethics and care in three leading business ethics journals (*Business and Society Review*, *Business Ethics Quarterly*, and *Business and Society*).

There is a large body of literature that embraces the concept of care, not in the pedagogical context, but in-general. To fully explore that literature is beyond the scope of this paper. However, we present some fundamental ideas to introduce the student- instructor relationship with regard to care and respect. The work of Gilligan (1982), Tronto (1993), and Noddings (2002) and expresses that caring is more of a process than it is a product or result. Care occurs in a context and is largely relational.

As Hawk & Lyons (2008) report, within the broad umbrella of an ethic of care, there is a smaller literature on an ethic of care within the learning/teaching context, or pedagogical caring. The contextual and relational characteristics still prevail. In this framework, the instructor or teacher is the one caring and the student is the one cared for.

Hult (1980, p. 242-3) identifies three levels of recognition in the pedagogical relationship: (1) the teacher recognizes and understands the student as a unique individual self; (2) the teacher recognizes the student as a person in the sense of being a member of the category of all persons having certain ethical rights which the teacher is obligated to respect; and (3) the teacher recognizes the student, as one who has certain needs and expectations that a pedagogical service is to be delivered, and has rights which protect and guarantee that these expectations are fulfilled.

The first level, above, leads the teacher to discover what is unique or novel regarding each student. The second level asks or requires the teacher to respect each of the students as a person. The third level, that suggests a contractual relationship to an extent, leads the teacher to regard both the student and himself as role occupants. In the role as teacher, the teacher evaluates the student's performance as well as his/her own performance. In the faculty-student relationship,

class size may or may not limit or constrain caring behavior as the caring relationship could manifest in a one-to-one exchange or in a one-to-several exchange. Within some reasonable limits to class size, the caring relationship is not necessarily constrained by class size.

Demonstrating Respect in the Pedagogical Context

The literature on respect in the university classroom is even thinner than the literature on caring. The respect literature, however, also embraces the notion of *civility* to some extent and we report briefly on that concept in the section following this one.

The first two levels of pedagogical recognition proposed by Hult (1980, p.242-3 and see in the section immediately above) correspond to the concept of "recognition respect" and the third to the concept of "appraisal respect" introduced by Darwall (1977). Recognition respect is owed to virtually all individuals who should be taken seriously by others, in this instance, course instructors. Darwall (1977) suggests that the other form of respect, appraisal respect, is an attitude toward a person for whom we seek to help express their excellence in some specific pursuit. A caring and respectful instructor would have such an attitude toward students.

Classroom Incivilities and Disrespecting Students

Linked to the concept of respect is the notion of classroom incivilities. This area is receiving substantial attention in the popular press and literature if not in the research of pedagogy. In a recent article, Bjorklund and Rehling (2010) attest to the growing interest in the topic of classroom incivility. Most faculty can report recent instances of student behavior in class related to the sound of unique phone ring tones, students texting one another during class or even engaging in computer games during class and other clever uses of mobile technology. With recent developments such as the iPhone, Kindle, and the iPad, students have even more opportunities to distract themselves and others.

Buttner (2004) used an inductive, qualitative approach to examine 228 undergraduate student accounts of respectful and disrespectful behavior of instructors in their undergraduate business classrooms. Her content analysis of students' responses to two questions yielded seven categories of respectful and disrespectful instructor behavior, that include: treatment of students, giving task-related help to students, responsiveness to students' unusual situations, affirming students' efforts, and maintaining classroom integrity. She found that respectful behavior was exemplified by recognition of students' perspectives and by the treatment of students, including showing concern and sensitivity to students' situations. She noted disrespectful instructor behavior in terms of poor treatment of students and an unwillingness to provide course-related assistance.

In summation, we, as instructors, should be aware, continually, that our students are unique individuals, leading to the realization that our relationships with them need to be contextual and concrete. Pedagogical caring and pedagogical respect would have us develop a repertoire of skills and dispositions that enhance the pedagogical relationship and a portfolio of pedagogical activities that offer guided participation and practice as well as scaffolding approaches to help our students become more competent in the content and skills of the course, more self-directed in

their learning, and more cultivating of the value of relationships. Faculty must extend recognition respect to all students as unique, developing human beings as well as appraisal respect for the academic progress they achieve.

In the next section of this paper we offer the details of our study of two samples of learners relative to their responses to four questions (see above, Background). Then, we present some information and guidance pursuant to care and respect in the classroom.

STUDY METHODS AND RESULTS

We identified two distinct types of students to survey with the four questions. The student groups represent samples of opportunity and the questioning took place over several semesters in a mid-Atlantic, public university in the United States. Nearly all participants fell within the 20 to 30 age range and the proportion of men and women per each sample was nearly equal. As the samples of students are from the same university, it is possible to assume that the results of the survey are reflective of that university, only. The important information from each of the four questions is displayed in table form.

TABLE 1.

QUESTION 1: *Have you ever had the feeling that an instructor had "given up" on you and your learning in a course?*

Student Group	Number of Course Sections	Number of Students	"Yes" N	Responses %	"No" N	Responses %
MBA Students (2 different courses)	14	210	93	44	117	56
Accounting Students	2	50	18	36	32	64
Total	**16**	**260**	**111**	**43%**	**149**	**57%**

In Table 1, we see that more than one-third of the accounting students reported having been given up on by an instructor and even more (44 per cent) of MBA students report the same thing. These figures seem somewhat alarming to us, and we realize that other observers may believe that the results are not particularly alarming. Also, the results may reflect conditions at the university where students were sampled and are not reflective of higher education institutions, in general. Students who reported perceptions of having been given up on by an instructor were asked to give a description or example of the behavior that they believed supported their perception. In both samples, all participants provided descriptions of the behavior. This next comment does not weigh on the data we collected and interpreted, however, we believe it is

worth noting. Interestingly, as we observed the participants respond to this item we noticed that, after being asked, virtually all of them immediately put pen to paper. There was no hesitation; there were no blank stares and no questioning looks. There may be several explanations for this behavior.

For this exploratory research, we decided to treat the two groups of participants as a single group of adult learners without making distinctions regarding how each separate group responded. We then assembled all of the descriptions the participants supplied, and by means of a hand sort, we independently placed all of the descriptions into 13 indicators. We had to reconcile small differences in our interpretations as well as eliminate duplicate responses. Insofar as possible we kept the response language in the words of the participants. This information appears in Table 2. Intuitively, we believed that these descriptors were not equally influential for students. Having categorized the *given up* descriptors into 13 categories, we next ranked the descriptors as to level of severity: mild, moderate, and strong. This ranking was determined by us through consensus and with input from faculty colleagues. Obviously, this is not a highly scientific process and placement of behaviors into the various categories is open to interpretation.   Using the definitions of Darwall (1977) with regard to recognition and appraisal respect, we also sorted the behavior descriptions into these two respect categories.

TABLE 2.

QUESTION 2: *What did the instructor do or not do to give you that feeling*?

[Responses Categorized by Level of Severity and Type of Respect]

	Lack of Recognition Respect		Lack of Appraisal Respect
	Mild Severity		**Mild Severity**
2b.	Instructor showed no concern for helping me to catch up after a lengthy but legitimate absence.	2a.	Instructor had no enthusiasm for the course material.
		2c.	Instructor became detached from class; didn't teach the subject.
	Moderate Severity		**Moderate Severity**
2d.	Instructor showed a lack of compassion, caring, and understanding.	2m.	Instructor made no attempt to determine whether students were struggling.
2e.	Instructor did not speak or communicate with me.		
2f.	Instructor declined to call on me in class; expressed dissatisfaction with any of my attempts.		
2g.	Instructor didn't attempt to help with my requests for assistance.		
2l.	Instructor exhibited a generally discouraging attitude.		
	Strong Severity		**Strong Severity**

2h.	Instructor bluntly stated that I would not be able to pass the course no matter what I did.	2k.	Instructor failed to return graded assignments.
2i.	Instructor would not answer my questions and told me I should already know that.		
2j.	Instructor got irritated when students asked questions; insulted students.		

Our third question was about consequences. That is, we asked participants to tell us what they did as a result of their perception or belief that an instructor had given up on them and their learning. In a manner similar to that regarding question 2 above, we extracted through a hand sort four response categories for the participant's answers to the question. Table 3 offers four response categories that range from doing nothing (3 a-c), passive coping (3 d-e), active coping (3 f-h), to approaching the instructor (3 i-j). In a few cases, participants offered more than one response to the question. As closely as possible, we retained the participants' actual wording of their responses.

TABLE 3.

QUESTION 3: *What did you do as a result of that perception or belief?*

Doing Nothing
3a. Did nothing.
3b. Basically, I gave up on the course.
3c. Just got through the course.

Passive Coping
3d. Decided to avoid this instructor in the future.
3e. Stopped asking questions.

Active Coping
3f.   I relied solely on the text, other materials and gave up on the lecture.
3g. I talked with other participants to help resolve my confusion about content.
3h. Sought out other instructors to help me.

Approaching Instructors
3i. Approached instructor about my learning but received an unacceptable response.
3j. Told instructor how I felt about things - then determined to succeed in spite of him. I just
        decided to work harder.

The last question asked of our sample participants required them to identify the specific ways in which an instructor can demonstrate or communicate to the participants that she/he has not given up on them and their learning in a course of study. All sample participants, regardless of whether they had or had not perceived that they had been given up on by an instructor were encouraged to respond to this question. Virtually all of the participants responded to this question.

Once more, with mutual agreement, we distilled all 24 of the response types into six categories: (1) instructor preparation and enthusiasm; (2) establishing an encouraging and safe environment; (3) recognizing participant learning differences; (4) involving students; (5) providing constructive and/or developmental feedback; and (6) instructor availability to learners. The titles of the six categories are somewhat arbitrary and open to interpretation. This information appears in Table 4.

TABLE 4.

QUESTION 4: *What are ways that an instructor can demonstrate or communicate to you that she/he has not given up on you or your learning?*

Instructor Preparation and Enthusiasm
4a. Being well-prepared and interested in each class session and enthusiastic about subject.
4b. Admitting fallibility, not knowing.

Establishing a Safe and Encouraging Environment
4c. Taking a personal interest in each student, knowing them.
4d. Giving personal words of encouragement.
4e. Continually encouraging and supporting students in class and individually.
4f. Exercising patience.
4g. Showing impartiality.

Recognizing Student Learning Differences
4h. Listening actively and carefully to students.
4i. Recognizing and acting on the uniqueness of each student.
4j. Adapting/adjusting to class learning pace and individual learning paces.
4k. Taking time to learn new ways to help students learn.
4l. Changing learning facilitation style to match that of students.

Involving Students and Checking for Comprehension
4m. Monitoring understanding of all students and retracing steps until all understand.
4n. Approaching students individually to check on comprehension and understanding.
4o. Asking probing questions to get students involved.
4p. Providing additional assignments aimed at helping students to understand.

Providing Constructive Developmental Feedback
4q. Giving frequent feedback on progress and progress reports during the term.
4r. Beginning feedback with something positive.
4s. Recommending appropriate student services.
4t. Asking students how the instructor can help them improve their performance.

Instructor Availability
4u. Being available to students especially after class and by email.
4v. Encouraging availability to students outside of class, one-on-one.
4w. Responding quickly to personal student communications.

4x. Answering student questions directly and clearly.

DISCUSSION OF RESULTS

We choose to frame the discussion of results in two clusters: first, a contrast of our study data with the findings of the research of Boice (1996) and Buttner (2004). Second, we examine the findings from the perspectives of pedagogical caring and respect.

Two of Boice's categories of instructor behavior that did not convey care and respect towards students were: (1) discouraging students' questions and/or participation; and (2) being aloof and distant from students, and both were clearly reflected in the results of the present study. As Boice (1996) studied classroom incivilities on the part of instructor and students, it may be that instructor behavior in the face of student incivilities results in a withdrawal of care and respect towards students. That is, we may have a cause and effect relationship. This idea is supported by the research of Hirschy (2004) who reports that classroom incivilities have consequences for both the students and the instructor. Further, faculty may not have the training or skills to effectively manage the causes of classroom incivilities. Also, compared were the seven categories of the respectful/disrespectful statements from Buttner's (2004) research with the responses of the participants from our samples to question 2 in Table 2. With the exception of Buttner's category, affirmation of students' efforts, we are able to find descriptors for all other categories, and, in some cases, we find several descriptors for a given category. These comparisons serve as a validation of the general findings of Buttner and help to give greater shape to the landscape of student perceptions of instructor behavior. We had the same findings as Hawk and Lyons (2008) when it comes to seemingly important factors such as: (1) a mention of clearly stated course learning goals; (2) clearly stated grading criteria; and (3) comments about the course syllabus or plan. That is, there was no mention of these elements by any participants in our samples.

With regard to pedagogical caring and respect, the learners who responded to Question 2 (Table 2) provided their own interpretations of the behaviors they said they experienced. The primary interpretation was that the instructor had given up on them and their learning in the course of study. Reviewing the information in Table 2 clearly supports this interpretation as the information presents the instructor as one who does not engage in a caring relationship and who does not accord the learner recognition and/or appraisal respect.

The information in Table 2 may be interpreted to suggest that if instructors desire for the classroom environment to be one of mutual caring and respect, instructor-learner, then instructors may have to take the initiative to create opportunities for learners to offer feedback on how well the learning is taking place in the course. This initiative may also help avoid classroom incivilities (see Clark, 2009; Bjorklund & Rehling, 2010). Instructors may take initiative to encourage students to be active seekers of feedback (Ashford, Blatt & Vande Walle, 2003) for the learner's own growth and to help learners move beyond passivity and conventionality when it comes to inquiring about what is done in the classroom. In the next and final segment of this article, we provide suggestions and guidance to instructors that flow from the information identified in our surveys.

BEHAVING IN CARING AND RESPECTFUL WAYS TOWARD LEARNERS

Learning that a relatively high percentage of students indicated that they perceived that at least one instructor in their post-secondary education had given up on them and their learning in a course came as a bit of a surprise. We were not surprised, however, by the descriptions of the behaviors they offered as indicative of giving up nor were we surprised by the several behaviors they explained that were indicative of a caring and respectful pedagogy.

Demonstrating or modeling pedagogical caring and pedagogical respect are the appropriate actions for an instructor. Caring helps us to reach all of our students. Students who experience an environment of care may be more committed to study in a course and may be more motivated to perform. In a related vein, the research on interactional justice in organizations and in workplace environments (Namie, 2000; Namie et al., 2001) indicates that employees who are respected and who are treated well frequently perform better on the job. Further, Buttner's (2004) findings indicate that when students are not treated with care or respect, many of them report accounts of how their self-esteem suffered and how their behavior toward the course and the instructor changed. Many said they declined to participate in class discussions, came to class late or left early, missed class, dropped the class, or a combination of these actions.

Depending on the sample under consideration, the questions placed before the learners in the present study reveal that a substantial percentage of them believe that one or more instructors had given up on their learning in a course of study. Nevertheless, there is a constructive side to the inquiry. Table 4 presents a number of behavioral indicators that learners felt were characteristic of instructors who had not given up on their learning. Many of those indicators are the mirror opposites of the indicators presented in Table 2. Furthermore, the six broad groupings in Table 4 of: (1) instructor preparation and enthusiasm; (2) encouragement and providing a safe environment; (3) recognition of diversity of student learning approaches; (4) checking on comprehension; (5) constructive feedback and (6) instructor availability are congruent with the characteristics of pedagogical caring and respect. These groupings also parallel, at least partially, the accounts reported in Buttner (2004).

The foregoing information and analysis suggests that there are a number of specific actions that instructors can take to model and cultivate pedagogical care and respect in their courses. Our review of the literature, the results from Buttner (2004) and Hawk & Lyons (2008), the results from our own surveys reported earlier in this work, and what we have learned from our own classroom practices, offer a number of practical suggestions.

Instructors should:

- *make sure course performance expectations and learning requirements are clear.*
- *strive to provide an encouraging and supportive environment for students to risk their ideas and questions, to offer their voices, to listen carefully, and to reflect on what is happening in class and in their own learning.*
- *get to know our individual students through the use* of *beginning-of-course questionnaire and/or personal interaction.*

- *recognize that it is likely necessary to provide different approaches to instruction because students do not all learn in the same way.*
- *provide much constructive feedback on student performance.*
- *model caring and respectful behavior to all students.*

Table 5 summarizes many of the course attributes that we have found to communicate pedagogical caring and respect.

TABLE 5.

Course Attributes that Communicate Caring and Respect

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1. Sending out a welcome letter to the learners before the start of the course.
2. Providing the course guide or syllabus, on-line or hard copy, to the learners before the start of class.
3. Providing feedback and evaluation rubrics on all graded activities in the course guide or syllabus.
4. Providing a desk name card for each learner during the first class session.
5. Having the learners complete a personal data sheet during the first class session.
6. Administering learning style instruments to the learners at the first class session and sharing results.
7. Using open-ended questions to stimulate discussion.
8. Providing sufficient wait-time after questions to allow for reflection and crafting of responses.
9. Choosing learning activities that are active and involve the participants in their own learning processes.
10. Giving clear and thorough written developmental feedback on all aspects of written papers.
11. Giving the learners opportunities to hand in drafts of written work for developmental feedback.
12. Offering the learners a mid-course opportunity to give you formative feedback on how the course is going.

FINAL COMMENTS

One thing that emerges from this research and the research of others is the inference derived from student comments and reported perceptions that students want instructors to create and moderate somewhat inclusive and democratic classrooms. These classrooms embrace openness, mutual respect in terms of recognition and appraisal respect, and focus on helping students achieve instructional and personal goals. Elenas (2006) has defined a democratic classroom as one where all participants are welcome and students believe they can contribute to discourse.

Stone-Norton (2008) and Ladson-Billings (2001) help to shape the concept of the inclusive classroom by identifying several of the features we have listed above in our suggested practices. This includes, for example, asking for student feedback on class activities, using diverse teaching

techniques, inviting student participation, and demonstrating authentic care and respect toward students.

With reference to democratic and inclusive teaching environments, Jinkins (2003) has suggested that in post-secondary education courses instructors should place a priority on their interactions with students and on interaction of students with each other. This interaction can be moderated with the use of a variety of teaching methods and tools such as cases, simulations, and group projects. And, in courses that are conducted partially or wholly online, Machuca (2007), who studied the teaching of accounting to students online, suggests that a caring attitude toward students may be expressed by some one-to-one time with each student via chat technology or by phone and by moderating teaching methods so as to reach different (verbal, visual, etc.) learners' styles. Finally, in Smith's (2006) study of both accounting graduates and public accountants, he found that the two groups rated most highly these teaching methods: in-class discussions, in-class experiential exercises, and case work in class. Each of these methods involves students in active participation and thus demonstrates a positive valuing of student-as-participant.

Future exploratory research in the domain of pedagogical care could focus more on care effects by gender, differences among learners in different disciplines, and on various aspects of student performance to include participation and involvement in class discussions, absenteeism, performance on tests and quizzes, and grades. Instructors have the opportunity to model an ethic of care in their classrooms, in their relationships with their students, and in their relationships with their discipline, their colleagues, and themselves. Students who experience that modeling may be more willing to adopt an ethic of care in their own lives and become models for others.

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