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# TOWARD MORE EFFECTIVE RECRUITMENT OF MILLENNIALS ACCORDING TO JOB INTEREST: A COMPARISON OF JOB TITLES VERSUS JOB ACTION STATEMENTS

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## ABSTRACT

*Millennial-aged workers have been of keen interest to personnel management researchers and practitioners over the past decade with much of the attention focused on the challenges of recruiting and retaining workers from this generational cohort. Yet, within the recruitment context little research has addressed the influence on Millennials' job seeking intentions based on job title attraction. Only one prior research study was found that directly examined the influence of recruitment advertisement structure (i.e., job titles versus job action statements) on the attitudes about jobs expressed by applicants. However, there were several key limitations of this study, primarily because it was conducted several decades ago and well before the advent of the internet which today is a primary source of information for job applicants as well as a common recruitment tool for organizations. As such, the purpose of the current study was to partially replicate the study and examine the effectiveness of job titles versus job action statements in recruiting workers in a contemporary setting. Results indicated that among Millennials, levels of interest in obtaining more detailed information about a job were significantly greater when job action statements were used in a hypothetical online job advertisement scenario compared to job titles in general, and also within occupational categories.*

## Introduction

Job titles have long served a variety of purposes within and outside occupational settings. For example, job titles serve as a sort of 'shorthand' for recognizing various occupational attributes such as one's knowledge, skill, ability, and other job holder characteristics (Grant, Berg, & Cable, 2014). At the same time, these same job titles may influence the level of employee commitment to their jobs and to the organization by establishing a job holder's identity within the organization through a sense of pride (see Baron & Bielby, 1986). While job titles delineate the organization's structure and hierarchy, they also play a role in establishing more realistic expectations and trust-building with other employees and with the organization

itself (e.g., Bechky, 2006; Klein, Ziegert, Knight, & Xiao, 2006).

Regarding the influence of job titles on individual perception, prior research has revealed that these can elicit occupational and dispositional-related perceptions across a variety of jobs and work contexts. For example, job titles have been shown to moderate the relationship between human resource professionals' role identification and their willingness to participate in a change effort (see Caldwell, R., 2002). Job title studies have also been associated with individual perceptions of equity, such as Swiercz & Smith (1991) who observed that university employees perceived their job status, as operationalized via job titles, significantly influenced both work input and outcome

expectations. Similarly, Greenberg and Ornstein (1983) observed that the degree to which a job title was 'earned' also influenced perceptions of equity. Finally, Weeks and Leavitt (2017) observed that occupational titles influence perceptions of social class rank and status, and within the organization have been shown to positively influence job performance evaluations (see Smith, Hornsby, Benson, & Wesolowski, 1989).

Job titles have also been associated with perceived differences in dispositional characteristics and occupational skills of those holding certain positions (Baron et al., 1986; Wright, Wood, & Lee, 1996). In addition, job title refinement has also been used as a means of reducing perceptual ambiguity between academic and practitioner members of a professional organization (see Silzer & Parson, 2014).

Prior studies have also considered the influence of a job title on applicant perceptions and intentions. For example, Sanchez, Prager, Wilson, and Viswesvaran (1998) examined within-job-title variance and found that among subject matter experts, their expectations of job tasks differed based on job title were inconsistent with the actual job tasks identified through job analysis. Thus, individual experience and other factors contribute to job title-based perceptions.

Regarding implied job-focus based on job title, Hawkes and Weathington (2014) found limited support for personality differences regarding the attractiveness of jobs where the job descriptions were task versus competency-based. Specifically, where no overall differences in personality dimensions among finance, management, and nursing majors were found between task and competency-based job descriptions, competency-based job descriptions demonstrated greater attractiveness for nursing major applicants with greater levels of openness to experience.

Finally, gender-based differences have also been attributed to job title perceptions. For example, Cleveland and Smith (1989) observed the effects of gender orientation (masculine versus feminine) of job titles and perceptions of actual job tasks. Similarly, Jessell and Beymer (1992) observed the influence of job titles on occupation sex-typing perceptions among middle-school aged children. Gender orientation of job titles have also been shown to influence job content perceptions during performance evaluation ratings (see Naughton, 1988).

### **Job Titles and Recruitment**

According to Mello (2002), because an organization's performance is directly related to its workforce, the decisions made during the staffing process will often play a deter-

mining role in the organization's outcomes. Furthermore, successfully meeting human resource planning goals often depends on being able to attract a large enough pool of applicants from the labor market from which top candidates can be selected, particularly in online recruitment systems. In order to successfully meet human resource planning goals, organizations often rely on effective recruiting strategies to attract a large enough pool of applicants from the labor market from which top candidates can be identified. Job titles are then commonly employed in order to draw job seekers' attention to advertisements for available positions.

Yet, the ability of job titles to facilitate a shared understanding of what a job entails (Cleveland, & Smith, 1989), and the potential meaningfulness for an individual occupying a job are primary challenges for recruitment program design. For example, Tijdens, De Ruitjer, and De Ruitjer (2014) observed significant differences in perceptions of work activities based on the similarity of job titles across 160 occupations in eight European countries. Also, Martinez, Laird, Martin, and Ferris (2008) noted that job titles may also be conceptualized as reinforced symbols that denote social value which can be leveraged by an organization to elicit increased commitment and performance which ultimately benefits the organization. Furthermore, while job titles are often conceptualized as serving administrative purposes, they may also influence deeply held beliefs that we have about ourselves and others, and upon which our self-concepts are based (see Ashforth & Kreiner, 1999). For example, Grant, Berg, and Cable (2014) observed that when given the opportunity to create their own job title, employees experienced reduced stress and emotional exhaustion, presumably because the self-reflective job titles served as key mechanisms for identity expression. In addition, when a job title denotes a socially stigmatized job, feelings of anxiety and stress may result which may lead a potential applicant to consider other available options (Ashforth et al., 1999; Wrzesniewski & Dutton, 2001).

On the other hand, Grant et al. (2014) surmised that the degree to which job titles enable an employee to self-express will have a direct influence on their social integration and job success. Ostensibly, such an influence would play a key role in the effectiveness of a recruitment strategy as applicants could be expected to be more attracted to a job title that they reflects their identity, or at least provides a sense of context and meaning from which the applicant can better perceive a sense of both job and organization fit.

## Recruiting Millennials

Of particular interest over the past decade has been on how to recruit and retain Millennial-aged workers which is the largest generational cohort now in the workforce. Specifically, the “Millennial” generation has been of keen interest for both researchers and practitioners because of the sheer number of workers within this generational cohort (roughly 89 million) and because these workers do not identify with the same occupational norms and values as their predecessors. For example, in a nation-wide study of Canadian university students, Ng, Schweitzer, and Lyons (2010) found that compared to older demographics, Millennials were highly concerned with the individualistic aspects of a job, in particular career advancement, skill building opportunities, and work-life-balance. And as noted by Twenge (2006), unlike their predecessors Millennials place a premium on opportunities for self-expression both in and out of the workplace, and as such may be more attracted by non-traditional job titles. In addition, Cho, Park, and Ordonez (2013) noted that Millennial attraction toward an organization is influenced by the organization’s social media policies since Millennials view such policies as an indicator of potential person-organization fit. Finally, Erhart, Mayer, and Zeigert (2012) found that among other variables, website usability was a key factor for successful online recruitment of Millennials which underscores the need to investigate recruitment content format such as job titles versus job action statements.

Clearly, a key to success for any recruitment strategy is to address the interests and preferences of those currently in the labor market; however, the unique characteristics of different generations often present challenges when developing and implementing a recruitment strategy. Therefore, a relevant question becomes whether traditionally structured job titles can not only attract the attention of Millennial applicants, but are capable of generating sufficient interest in the job for an applicant to investigate the job description information.

While much attention has focused on the challenges of recruiting and retaining Millennial workers, particularly through emphasizing the desirability of employment benefits (e.g., Howe, 2014) and job characteristic preferences (e.g., Smith & Galbraith, 2012) during the recruitment process as a means of promoting available positions, little research has addressed the influence on Millennials job seeking intentions based on the job title structure itself in a job recruiting context. Prior research has demonstrated that job titles have significant influence on individual perceptions and attitudes about both the jobs themselves and even those that occupy them. For instance, job titles have shown to reinforce gender (Gaucher, Friesen, & Kay,

2011; Formanowicz, Bedynska, Cislak, Braun, & Sczesny, 2013), occupational stereotypes regarding ethnicity and sexual orientation (Lipton, O’Connor, Terry, and Bellamy, 1991) as well as sexual orientation and gender (Wood-Nartker, Sepanski, McCrady, & Gligor, 2007). Job titles have also shown evidence of influencing job quality impression as being a function of recruitment advertisement dialect (Van Meurs, Korzilius, Planken, & Fairley, 2007). Thus, while sufficient evidence exists to support the general notion that the wording of a job title can moderate the level of initial job interest for a potential applicant, only one prior research study was found that directly examined the influence of job title structure on the attitudes about the jobs expressed by applicants.

Specifically, Crowley (1981) compared applicant perceptions of job status and prestige (and thus desirability) among British high-school students when formal job titles were used in job advertisements versus “action titles”, which were abbreviated action-oriented descriptions of the job. For example, where a recruitment advertisement might use the formal job title “*Hotel Manager*”, the corresponding action statement would be “*Organize and manage staff in a hotel*”. In his study, Crowley (1981) theorized that action titles, as opposed to formal job titles, could provide a certain level of context that would be of greater interest to a potential applicant. And while the Crowley (1981) study found no significant difference in the participants’ perceptions of job status or prestige based on whether the questionnaire employed job titles versus action statements, there were several significant limitations. First, participants in the study were relatively young (15 year olds) in age compared to most participant groups in occupational interest-based studies. Second, participants rated occupational interest inventory items based only on the degree of status or prestige that they felt a particular job had depending on whether that job was described by a formal job title versus a descriptive ‘action title’. Third, the data collected was nominal where respondents simply indicated via checklist whether they either liked or disliked a particular job based on the occupational interest inventory structure (i.e., job titles versus action statements). Finally, when the Crowley (1981) study was conducted the only modes of job advertisements available consisted of television, radio, and printed formats, and the author’s contention at that time was that little could be gained by using one approach versus the other in terms of gaining interest from job applicants. However, the modes of communicating job advertisements today are beyond what was possible several decades ago. Therefore a pertinent question is how effective would job action statements be today, with a generation of individuals whose daily activities involve web-based navigation, searches, and information

processing and who may not share the same occupational and career values and expectations as prior generations.

Despite the limitations of the Crowley (1981) study, we feel that the underlying premise of providing some job context to an applicant by using an action statement was highly relevant for assessing the perceptions of the current Millennial generation. For example, Phillips-Wren, Doran, and Merrill (2016) recently emphasized the need for current organizations to consider non-traditional modalities such as social media in order to more effectively recruit Millennials. These authors noted that traditional job postings do not lend themselves to creating the experience current that attract current job seekers. As such, they advocate shifting recruitment strategies toward social media and web-based designs in order to increase engagement and personalization for the job seeker. And it is the notion of personalization that underscores our overall contention that adopting job action statements versus job titles could be a step in making contemporary job advertisements more effective.

Given the need for more effective approaches toward recruiting Millennials, the major aim of the present study is a partial replication and extension of the Crowley (1981) study, but with several key differences. First, the participants in the current study had received career development information and guidance as part of their formal undergraduate business education, whereas the student sample from the original Crowley (1981) study had little to no prior occupational knowledge. Second, the participants in the Crowley (1981) study were all high-school aged (15 year olds), and at the time of the study the internet did not exist. As such, those participants would not have had any understanding, expectations, or practical conceptualization of what an online job search would entail. In contrast, the students used for this study are all considered part of the Millennial generation (based on their age range between 20 and 22 years of age) who would be expected to have extensive experience interacting with key words and abbreviated content while conducting a variety of internet searches. Third, a central focus of the Crowley (1981) study was on perceptions of job status and prestige, and the degree to which they had some level of interest in the occupations listed. In contrast, the central focus of the current study was on the likelihood that a Millennial-aged participant would click a web link to access more detailed job description and job specification information after viewing either a job title or job action statement. Specifically, the current study proposes that one dimensional job titles are not expected to impart any meaningful identification to Millennials, and as such are more likely to be passed over compared to a job action statement that provides a context for the job that applicants would then use to form specific attitudes and preferences about the job

being considered. For example, Osipow (1962) noted that career preferences may be considered to be a specialized form of attitude. Thus, attitudes towards a job title would be expected to be a function of the general nature of the tasks, duties, and responsibilities envisioned by an applicant based on the primary role descriptor (e.g., "Manager"). In a similar way, the more elaborative job action statements that correspond to a job title might serve as a sort of abbreviated realistic job preview (RJP).

In general, a realistic job preview (RJP) includes information about a potential job that an applicant may find appealing, and also information about the job that the same applicant may find disagreeable. For example, Saks and Cronshaw (1990) noted that one of the critical functions of the RJP is to provide accurate information to the applicant to mediate applicant expectations, role clarity, and commitment to their choice. Thus, by presenting an applicant with both types of information, the applicant can develop a more realistic set of expectations of the job and thus facilitate applicant self-selection by promoting greater compatibility between a prospective employee and the job being applied (see Rynes, 1990; Vandenberg & Scarpello, 1990). What underlies RJP effectiveness is the fundamental assumption that the message of the RJP is received, processed, and internalized by the applicant. Consequently, several meta-analyses on RJP outcomes (e.g., McEvoy & Cascio, 1985; Phillips, 1998; Premack & Wanous, 1985; Wanous, 1980) have all generally supported the idea that an RJP, as part of the recruitment process, lowers applicants' initial expectations and increases their commitment to the organization.

This line of reasoning finds support from recent investigations into how Millennials think. For example, Corgnet, Epsin, and Hernan-Gonzalez (2016) examined the cognitive processing of Millennials, and observed that creative thinking among this generational cohort was integrated with both fluid intelligence and cognitive reflection. The implication for the current study is that when conducting an online job search, Millennials may be more likely to visualizing themselves while in a particular role while the job at the same consciously assessing whether a job would meet their needs. As such, where job titles may not be able to provide them with the context they seek, job action statements might.

Specifically, Crowley (1981) emphasized the need for job action statements to provide a degree of role context. As such, in the current study the same job description information from which the occupational groups were based was also used to develop the corresponding job action statements. An important note is that each job action statement was worded to reflect only the essential functions of the job and a corresponding performance out-

come. This was done in order to help focus job applicant perceptions so that interest in and perceptions of the job would be as task-based as possible. For example, for the job title of “Sales Manager”, the corresponding action statement developed was “Lead high performance teams to increase company revenue.”

Finally, in the Crowley (1981) study the jobs included were randomly chosen from a series of index-cards commonly used in career education programs. As such, participants were presented with a wide variety of jobs to consider. In contrast, all of the jobs listed in the current study were in a business-related field. Finally, while Crowley (1981) used high-school aged participants who were asked to consider the relative prestige of a certain job, in this study all of the participants were Millennial-aged college students who had declared their intention to pursue a degree in a business-related occupation. Thus, we felt that it was appropriate to narrow the focus of the job title and job action statements to jobs that were most relevant to the types of jobs the participants would seek upon graduation.

Hypothesis 1: Overall, Millennial-age individuals will self-report being significantly more likely to access job description information when the web link uses a job action statement compared to job title.

While examining the potential difference between a job title and job action statement in would be of general interest for contemporary recruitment professionals, so too would the potential effects across various occupational groups. As such, the job choices in this study were also categorized into general occupational groups based on job description information. Specifically, a list of “best business jobs” available online from *U.S. News and World Report* was used as a reference, and each job listed included a formal job title, and a detailed description of the duties, work setting, training, salary, and required skills for each. Using the job characteristics provided in the descriptions, jobs from the list were categorized into four general occupational groups. Those jobs with descriptions that included the general oversight of data collection, assessment, and interpretation of data were placed into an “Analyst” category. Job descriptions that indicated general authority for planning, communicating, controlling, and decision making were placed in a “Manager” category. Similarly, jobs that were primarily administrative and overseeing task completion were placed into a “Task-Directive” category, while those that were generally task oriented but in a primarily assisting role were placed into a “Task-Supportive” category.

Hypothesis 2a: When conducting an online job search, Millennial-age individuals will self-report being significantly more likely to access job description information for analyst-oriented jobs when the web link uses a job action statement compared to job title.

Hypothesis 2b: When conducting an online job search, Millennial-age individuals will self-report being significantly more likely to access job description information for managerial-oriented jobs when the web link uses a job action statement compared to job title.

Hypothesis 2c: When conducting an online job search, Millennial-age individuals will self-report being significantly more likely to access job description information for task directive-oriented jobs when the web link uses a job action statement compared to job title.

Hypothesis 2d: When conducting an online job search, Millennial-age individuals will self-report being significantly more likely to access job description information for task supportive-oriented jobs when the web link uses a job action statement compared to job title.

## Method

### Participants

For this study, a sample of junior-level undergraduate business students ( $N = 100$ ) from a mid-sized regional university was used for this study. Of the total sample, fifty four percent of participants (54%) were male, and forty six percent (46%) were female. Additionally, twenty-seven percent (27%) reported having held a full time job prior to enrolling in college, and almost all participants (99%) reported using an internet-enabled device to accomplish daily tasks.

### Procedure

Students were recruited by their course instructor and were told that they would receive extra course credit for their participation. Those students who volunteered to participate were given a self-report questionnaire that asked them to first envision themselves conducting an online job search. They were then instructed to rate the likelihood that they would (if being conducted online)

click each of 21 ‘hyperlinks’ listed on the questionnaire based on their initial reaction or feeling in order to access detailed job description information and job application instructions. The rating scale used by the participants to rate their intention to seek job description information for each job listed ranged from “1 = *Not at all likely to click on the link*” to “5 = *Extremely likely to click on the link*”.

One questionnaire version listed the job title links while another version listed the corresponding job action statement links. Furthermore, the order of the jobs listed was the same for both questionnaires. Roughly half of the completed questionnaires used in this study listed traditional job titles ( $N = 47$ ), while the other set of completed questionnaires listed the job action statements ( $N = 53$ ).

### Results

Comparing job title and job action statement influence of the overall sample, participants’ self-reported likelihood of accessing detailed information about a job was significantly greater in general when the participant was presented with job action statements ( $M = 71.28, SD = 11.29$ ) compared to when job titles were used ( $M = 58.04, SD = 11.10$ )  $t = -5.865; p = .000$ . Thus, hypothesis 1 was supported.

Additional means test results also supported hypothesis 2a as the likelihood of accessing occupational information for jobs within the ‘Analyst’ occupational group was significantly greater when the participant was presented with the job action statements ( $M = 13.90, SD = 3.21$ ) compared to when the job title only was used ( $M = 11.36, SD = 3.54$ )  $t = -3.86; p = .000$ . Similarly, the likelihood of accessing information for jobs within the ‘Manager’ occupational group was significantly greater when the job action statement format ( $M = 14.96, SD = 2.66$ ) was used compared to when the job title format ( $M = 13.63, SD = 3.54$ )  $t = -2.09; p = .036$ . Therefore, hypothesis 2b was supported.

A significant difference was observed for the ‘Task-Directive’ occupational group where the likelihood of accessing occupational information was greater for the job action statements ( $M = 13.09, SD = 2.60$ ) compared to when the job titles were presented ( $M = 10.30, SD = 3.33$ )  $t = -4.68; p = .000$ . Therefore, hypothesis 2c was supported. Finally, a significant difference was observed for the ‘Task-Supportive’ occupational group where the likelihood of accessing occupational information was greater for the job action statements ( $M = 14.79, SD = 2.64$ ) compared to the job titles ( $M = 12.55, SD = 3.32$ )  $t = -3.75; p = .000$ . Thus, hypothesis 2d was also supported.

A complete summary of the means test results is presented in Table 1.

Group	Condition	N	Mean	Std. Dev	F	Sig.	t	df	Sig. (2-tailed)
Overall Sample	Job Title	46	58.0435	11.10347	.101	.751	-5.865	97	.000
	Job Statement	53	71.2830	11.28542					
Analyst Job Group	Job Title	47	11.3617	3.36494	.243	.623	-3.865	98	.000
	Job Statement	53	13.9057	3.21214					
Manager Job Group	Job Title	47	13.6383	3.54122	3.081	.623	-2.128	98	.036
	Job Statement	53	14.9623	2.65998					
Task-Directive Job Group	Job Title	46	10.3043	3.33246	3.299	.072	-4.676	97	.000
	Job Statement	53	13.0943	2.59633					
Task-Supportive Job Group	Job Title	47	12.5532	3.32192	3.626	.060	-3.750	98	.000
	Job Statement	53	14.7925	2.64108					

## Discussion

The results observed from this study suggest that Millennial-age job seekers would be more likely to seek detailed job description information when conducting an online job search when the recruitment advertisement uses a job action statement versus a traditional job title. This may be a crucial factor if an organization's goal is to increase the effectiveness of an online recruitment effort when simply getting the attention of an applicant long enough to even consider an opportunity presented is often tenuous given the sheer number of online job advertisement sources. Consequently, adopting such an approach may enhance the effectiveness of an internet-based strategy in several ways.

First, a key aspect that Millennials look for in a job is for the job to provide a sense of purpose and that enables them to utilize their skills. As such, a job action statement such as *"Collect and decipher data to help solve complex organizational problems"* as opposed to the job title of *"Management Analyst"* may provide contemporary applicants with job context information sufficient enough for them to make a judgement about whether a particular job may or may not align with both their interests and skill. And given the sheer number of job advertisement outlets available online, a recruitment advertisement format that is designed to provide a rapid assessment of interest and skill alignment may be critical for capturing and holding a potential applicant's interest.

Second, because job action statements presumably provide more context rich information in a highly abbreviated format, it would seem that the appeal of such an approach may be greater for Millennial-age workers who may value person-organization fit over person-job fit. For instance Cho, Park, and Ordonez (2013) found that organizational attractiveness and job pursuit intention among Millennials was mediated by an organization's ability to demonstrate more open communication and support for online communication such as social media. Therefore, when a job action statement is structured to suggest that collaboration is a key job characteristic (i.e., using phrases such as 'to work with' versus 'to work for') it may be sufficient for applicants to accurately envision the nature of a potential work relationship. For instance, this type of phrasing may be interpreted in such a way that the job seeker would be led to believe the organization might support reverse mentoring, which is highly valued by Millennial workers.

Third, as previously discussed, the context provided by a job action statement may enable the Millennial job seeker to initially form a more realistic expectation of what the role entails. This would not only serve to better attract

applicants based on the job tasks, but it may also serve to help minimize attributes of the job which may dissuade them from wanting to apply for the job. As noted by Hershatter and Epstein (2010), while the actual values and career goals of Millennials compared to prior generations are not as disparate as commonly believed, they are highly motivated to behave in ways that provide identity to and lend a sense of uniqueness to their generational cohort. Thus, while traditional job titles may be viewed by Millennials as reflective of the recruitment strategies used for prior generational cohorts, job action statements may then be viewed as being unique to their own generation. For example, Veinberg (2014) observed preferences for methods of news information gathering were distinct among generational cohorts. The one notable exception observed was in situations where real-time information was needed when the telephone was the primary mode of information gathering.

Overall, the results observed in the current study certainly warrant further exploration. Specifically, future research should focus on identifying and modeling causal factors, particularly those that may influence the relationships among dispositional and behavioral characteristics of Millennials and their job seeking intentions. In particular, unlike previous generational cohorts who incorporated technology as a supplement to work and life skills, the Millennial generation to a large extent has integrated technology into their lives from an early age.

Those in the Millennial Generation are often referred to as 'digital natives' (e.g., Hershatter & Epstein, 2010; Wagner & Acier, 2017) because they are the first generation to grow up with the internet and have incorporated digital technology into many functions of their daily life. And in addition to a conscious preference for information obtained through a digital medium, there may also be unconscious habitual tendencies towards job action statements due to the way in which web browsing is typically conducted. Specifically, it could be that such a preference is due to the effect of reflexive information scanning such as when conducting a typical web search where the results are presented not only with a link to a web page, but also with a more descriptive summary text line located underneath.

If so, a relevant focus for future research should be to determine the degree to which technology itself plays a role in the information search process. Because of questions such as this, our recommendation for future studies is to consider the influence of not only the individual cognitive and behavioral factors of online recruiting strategies in general, but also the potential influence of a digital platform when job action statements are used.

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# USING SIMULATION TO ESTIMATE PROBABILITIES

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### ABSTRACT

*How do you determine the probability of an event when outcomes are not equally likely, historical data are not available and enumeration or attempting to construct an ordered listing of elements is impractical? In these situations, simulation can be used to generate the probability distribution. This paper provides an illustration of the simulation method. The three methods of estimating probabilities are reviewed followed by a stepwise example demonstrating the simulation method using Excel.*

### Probability Predicament

For most sporting events, programs are created that list the rosters for both teams. In many cases, both in alphabetical and numerical presentations. One might wonder what the probability would be of having players being located in the same position alphabetically and numerically.

A variety of questions could be asked. For example, what is the probability that no one would be in the same position? Everyone would be in the same position? What does the probability distribution of  $X$ , the number of players in the same alphabetical and numerical position look like?

### Methods for Calculating Probabilities

Any elementary statistics book will list three common methods for calculating probabilities: the classical approach, the empirical method, and the subjective method.

The classical approach, sometimes called the count-and-divide method, assumes that each outcome is equally likely. Thus, the probability of each outcome occurring is found by  $1/n$  where  $n$  equals the number of possible outcomes. For example, when rolling a 'fair' die, the probability of getting a one is  $1/6$  as there are six equally likely outcomes {1, 2, 3, 4, 5, 6}. Similarly, the probability of flipping a 'fair' coin and getting a Head would be calculated as  $1/2$  as there are only two equally likely outcome {Head, Tail}. The classical approach is rather straightforward ex-

cept when it becomes difficult to calculate the number of ways an outcome can occur.

The empirical method, sometimes called the relative frequency method, uses historical data to determine the probability of a given outcome. For example, data from a production process could be used to estimate the probability that a part is defective – if two defectives are found in a random sample of 100 parts, then the relative frequency, 0.02 (2/100), could be used to estimate the probability that any particular part is defective.

When outcomes are not equally likely and data cannot be observed, probabilities can be estimated by using the subjective method. Suppose 'Steve' interviews for a job and his friend asks him afterwards what the probability is that he will be offered the job. The classical method would suggest that Steve's (and every other person applying for the job) probability of being offered a job is  $1/2$  as there are only two possibilities: he is offered the job or he is not. This does not seem like a reasonable assumption, as one would expect that factors such as education, experience, etc. would increase or decrease the chance of being offered the job. The empirical method would require Steve to interview for the job multiple times and the probability would be determined by the percentage of times Steve was offered the job – something that is impossible. As a result, Steve must subjectively determine the probability of getting the job from his interview experience.

### Enumeration and Its Difficulties

So, what is the probability of having no matches between the alphabetical and numerical listing of a team's players? Assuming that jersey numbers are not assigned alphabetically, the proper method for determining the probability of a player being in the same alphabetical and numerical position is the classical approach. Enumerating the possible outcomes will allow for the determination of the theoretical probability distribution. Let's take a simple example of a team with three players (and only first names): Adam, Brian, and Chris. Suppose each player is randomly assigned a jersey number. The possible number of arrangements of  $n$  players in numerical order is found by  $(n!)$ . So, 3 players can be arranged in  $3! = 6$  ( $3*2*1$ ) possible arrangements as shown in Table 1. For each arrangement, the players with matching alphabetical and numerical positions are indicated in red.

Arrangement	Lowest Number	Middle Number	Largest Number	Number of Matches
1	<i>Adam</i>	<i>Brian</i>	<i>Chris</i>	3
2	<i>Adam</i>	Chris	Brian	1
3	Brian	Adam	<i>Chris</i>	1
4	Brian	Chris	Adam	0
5	Chris	Adam	Brian	0
6	Chris	<i>Brian</i>	Adam	1

From the above table we can make the following observations:

The possible number of alphabetical/numerical matches is 0, 1, and 3.

There is no way to have exactly 2 matches because, if two players are in the exact same alphabetical and numerical position, the final player must occupy the final spot which must also form a match. *In general*, there can never be exactly  $(n-1)$  matches with  $n$  players.

Only one arrangement results in an exact alphabetical/numerical match for all player. *In general*, for any number of players there will be only one way to have the alphabetical and numerical listings match exactly.

The probability distribution for the random variable  $X$ , the number of matches is displayed in Table 2.

Number of Matches ( $x$ )	Probability
0	$2/6 = 0.333$
1	$3/6 = 0.500$
2	$0/6 = 0.000$
3	$1/6 = 0.167$

Now, consider a team with four players: Adam, Brian, Chris, and David. The possible number of numerical arrangements is  $4! = 24$  ( $4*3*2*1$ ). The possible arrangements, with matches indicated in red, are presented in Table 3, and the probability distribution for the number of matches appears in Table 4.

Arrangement	Lowest Number	Second Lowest Number	Third Lowest Number	Largest Number	Number of Matches
1	<i>Adam</i>	<i>Brian</i>	<i>Chris</i>	<i>David</i>	4
2	<i>Adam</i>	<i>Brian</i>	David	Chris	2
3	<i>Adam</i>	Chris	Brian	<i>David</i>	2
4	<i>Adam</i>	Chris	David	Brian	1
5	<i>Adam</i>	David	Brian	Chris	1
6	<i>Adam</i>	David	<i>Chris</i>	Brian	2
7	Brian	Adam	<i>Chris</i>	<i>David</i>	2
8	Brian	Adam	David	Chris	0
9	Brian	Chris	Adam	<i>David</i>	1
10	Brian	Chris	David	Adam	0
11	Brian	David	Adam	Chris	0
12	Brian	David	<i>Chris</i>	Adam	1

13	Chris	Adam	Brian	<i>David</i>	1
14	Chris	Adam	David	Brian	0
15	Chris	<i>Brian</i>	Adam	<i>David</i>	2
16	Chris	<i>Brian</i>	David	Adam	1
17	Chris	David	Adam	Brian	0
18	Chris	David	Brian	Adam	0
19	David	Adam	Brian	Chris	0
20	David	Adam	<i>Chris</i>	Brian	1
21	David	<i>Brian</i>	Adam	Chris	1
22	David	<i>Brian</i>	<i>Chris</i>	Adam	2
23	David	Chris	Adam	Brian	0
24	David	Chris	Brian	Adam	0

TABLE 4 PROBABILITY DISTRIBUTION FOR THE NUMBER OF ALPHABETICAL/NUMERICAL MATCHES WITH A 4-PLAYER TEAM.	
Number of Matches (x)	Probability
0	$9/24 = 0.375$
1	$8/24 = 0.333$
2	$6/24 = 0.250$
3	$0/24 = 0.000$
4	$1/24 = 0.042$

As with the case with the 3-player team, there is only one way for all players to be in the same alphabetical and numerical positions and it is impossible for all but one player to match. Using the counting rule for combinations, the number of ways of getting exactly two matches can be found. When there are two matches, as in the case of arrangement 2 from Table 3, there is only one way for the other two players to be sequenced without increasing the number of matches. So, the number of subsets of 2 that can be selected from the 4 players will provide the number of arrangements of exactly 2 matches (). *In general*, the number of ways of getting  $(n-2)$  matches can be found by. Unfortunately, there are no counting rules to find the number of ways of getting 0 and 1 matches and enumeration must be used.

Enumerating the possible numerical arrangements for 3- or 4-player teams is a fairly simple task. However, it becomes virtually impossible for even a team of a small number of players. The number of possible arrangements for various size teams is represented in Table 5.

TABLE 5 POSSIBLE NUMERICAL ARRANGEMENTS FOR TEAMS OF VARIOUS SIZES.	
Number of Players	Possible Numerical Arrangements
5	120
6	720
7	5,040
8	40,320
9	362,880
10	3,628,800

With 25 players on a team, there are 15,511,210,043,331,000,000,000,000 arrangements – an astonishingly large number!

### Simulating Probabilities

Given that there are no counting rules that can be applied for every situation and that enumeration quickly becomes an impossibility, simulation is the best method for determining the probability distribution. This can be accomplished using a few Excel functions (RAND, SMALL, INDEX, MATCH, IF, SUM, COUNTIF) and creating a data table to simulate a large number of iterations. The following process is used to conduct the simulation.

Assume that the same 4-player team described above is being used.

Random numbers are used to simulate the numerical listing of the four players while the alphabetical listing remains fixed.

The number of alphabetical/numerical matches is calculated

The process is repeated 10,000 times.

The total and percentage of times that 0, 1, 2, and 4 matches are obtained is calculated.

Figure 1 provides the alphabetical listing of the four players and the random number that is needed to simulate the numerical listing. Each of the numbers listed in Column D is the result of the RAND function that generates a random number between 0 and 1.

Column E in Figure 2 illustrates the sorted (smallest to largest) list of the random numbers generated in the first step. This is accomplished the using the SMALL function to identify the first, second, third, and fourth smallest values. The SMALL function has two arguments. The first argument identifies the array consisting of the

**FIGURE 1  
RANDOM NUMBER GENERATION.**

D3    :    ✕    ✓    f <sub>x</sub> =RAND()				
	A	B	C	D
1				
2		ALPHABETICAL Roster Position		
3		Adam		0.88273
4		Brian		0.71850
5		Chris		0.80747
6		David		0.22637

**FIGURE 2  
USING RANDOM NUMBERS TO  
SIMULATE NUMERICAL ORDERING – PART I.**

E3    :    ✕    ✓    f <sub>x</sub> =SMALL(D3:D6,1)					
	A	B	C	D	E
1					
2		ALPHABETICAL Roster Position			Sorted Rand#
3		Adam		0.88273	0.22637
4		Brian		0.71850	0.71850
5		Chris		0.80747	0.80747
6		David		0.22637	0.88273

**FIGURE 3  
USING RANDOM NUMBERS TO  
SIMULATE NUMERICAL ORDERING – PART II.**

G3    :    ✕    ✓    f <sub>x</sub> =INDEX(B3:B6,MATCH(E3,D3:D6,0))							
	A	B	C	D	E	F	G
1							
2		ALPHABETICAL Roster Position			Sorted Rand#		NUMERICAL Roster Position
3		Adam		0.88273	0.22637		David
4		Brian		0.71850	0.71850		Brian
5		Chris		0.80747	0.80747		Chris
6		David		0.22637	0.88273		Adam

random numbers generated is the first step. The second argument identifies which ordered value to return. So, =SMALL(D3:D6,1) returns the smallest value in the array D3:D6 (0.22637). The second argument for the formulas in cells E4, E5, and E6 uses 2 (0.71850), 3 (0.80747), and 4 (0.88273), respectively.

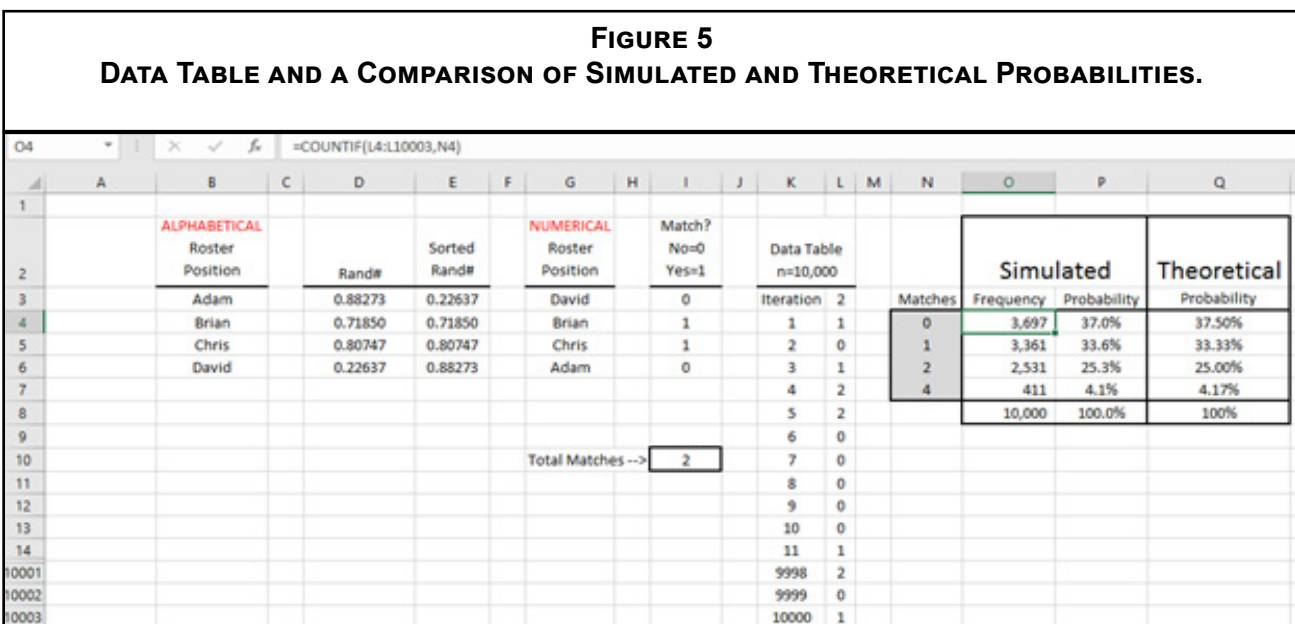
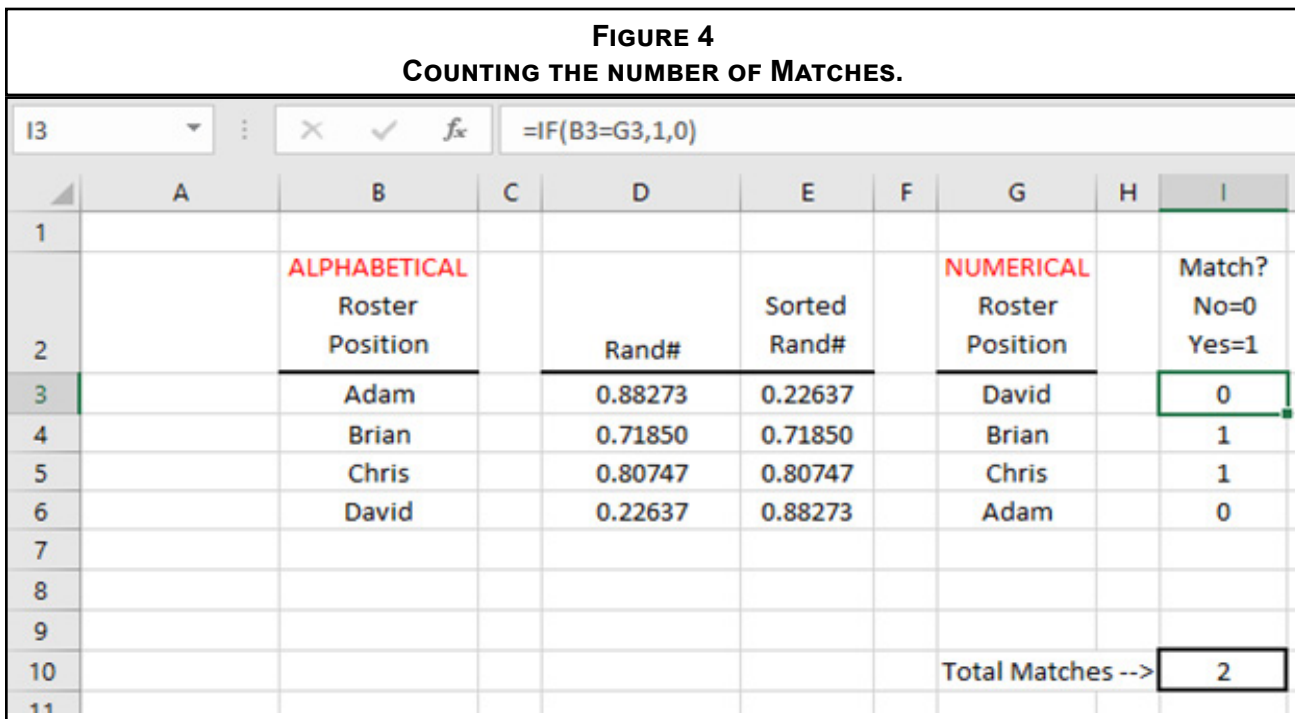
Next, the sorted random numbers in Column E are used to simulate a ‘numerical’ listing of the four players. This is accomplished by using two functions, INDEX and MATCH, in conjunction. The MATCH function is used to determine the position of the numbers in Column

E within the original random numbers in Column D. For example, MATCH(E3,D3:D6,0) looks in the array found in cells D3:D6 for an exact match to the value in E3 (0.22637). Once it finds an exact match, it returns the location or position of that value in the array, which is 4 as 0.22637 is the fourth number down. This value, 4, tells the INDEX function to ‘return’ the fourth value that is in the array B3:B6, which is ‘David.’ This is shown in Figure 3.

Figure 4 illustrates how the alphabetical and numerical listings are compared using the IF function and a ‘1’ is recorded in Column I wherever there is a match on a given row, otherwise a ‘0’ is recorded. Since ‘Adam’ is first on the alphabetical and fourth on the numerical list, a ‘0’ is recorded in cell I3 to indicate no match. Since ‘Brian’ and ‘Chris’ are alphabetical/numerical matches, a ‘1’ is recorded in cells I4 and I5. For this single iteration, the total number of matches, 2, is recorded in cell I10 by summing the values (SUM) in cells I3:I6.

Figure 5 provides the results of 10,000 iterations of simulating numerical listings of the four players. Columns K and L display the results using Excel’s data table. Note that all iterations between 11 and 9,998 are hidden. The values in Column L indicate the number of matches found in each iteration. The COUNTIF function in cells O4, O5, O6, and O7 is used to count the number of times (frequency) there were 0, 1, 2, and 4 matches, respectively. Dividing each of the counts by 10,000 provides the simulated probabilities show in Column P.

A comparison of the simulated probabilities with the theoretical probabilities as determined through enumeration is also provided in Figure 5. Each of the simulated probabilities is with five-tenths of a percent (0.005) of the actual probability.



**Summary**

As illustrated above, simulation can be used to estimate theoretical probabilities when mathematical calculations cannot be used and when enumeration is not possible. The relatively simple Excel spreadsheet described above, using just a handful of functions, performed over 200,000 calculations in just a few seconds to simulate 10,000 iterations. Only a few simple modifications to the spreadsheet are necessary to accommodate any reasonable team size.

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# TESTING SOME SPECIAL CULTURAL TRAITS TO BANKS' ABILITY TO INNOVATE

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## ABSTRACT

*Purpose: The literature prescribing important determinants of company innovativeness has identified several factors. Recent research has proposed and validated five main dimensions for innovativeness which have been validated empirically: organization creativity, openness, future orientation, risk-taking willingness, and proactiveness. The primary objective of this study is to empirically confirm each of these dimensions using a different measure for bank innovativeness addressing their absorptive capacity for change.*

*Design/methodology/approach: A field test using a mailed questionnaire to collect a relatively large sample has been used to test the proposed model. To eliminate possible multicollinearity among the independent variables, a multivariate regression analysis was used.*

*Findings: The results provide clear evidence that organization creativity, openness, future orientation, and proactiveness are directly related to bank capacity to innovate and together help explain a significant amount of its variance among banks.*

*Research limitation/implications: Despite the relatively in-depth literature, review supporting the proposed model, other independent variables are likely to be important and should be used in future studies.*

*Practical implications: The items used for measuring the main constructs provide specific insights into what bank managers should focus on and go about developing within their organizations.*

*Originality/value: While this study is strongly grounded in the existing literature and it empirically tests a new dependent variable independently proposed for another integrated model addressing organization innovativeness, critically important to business innovation success.*

**KEYWORDS:** *Bank innovation management, bank's ability to innovate, organization creativity, openness, future orientation, risk-taking willingness, and proactiveness.*

## INTRODUCTION

Studied by various groups under different titles, organizational innovativeness (OI), aka company entrepreneurial orientation (EO), and ability to innovate is widely accepted as an essential requirement for the business innovation success so important for business organizations to survive

and prosper in the long run (Ruvio et al 2014; Hurley and Hult, 1998; Hurley, Hult, and Knight, 2005; Sigauw, Simpson, and Enz, 2006; Subramanian, 1996). Previous research suggests that high levels of innovativeness (Deshpande, Farley, and Webster, 1993; Zahra and Bogner, 2000) and proactiveness (Lumpkin and Dess, 2001; Miller and Friesen, 1983) lead to increased organizational

performance. Innovativeness is embodied by a strong organizational commitment to “engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services or technological processes” (Lumpkin and Dess, 1996).

The relationship between company entrepreneurship/innovativeness and performance has received considerable attention in the organizational literature over the last several decades (Sandberg and Hofer, 1987; Tang et al., 2008; Todorovic and Schlosser, 2007; Wiklund and Shepherd, 2005). Specifically, scholars have theorized that the incidence of firm-level entrepreneurial behaviors will be positively associated with organizational profitability and growth (Covin, Green, and Slevin, 2006; Covin and Slevin, 1991; Ireland, Covin and Kuratko, 2009; Lumpkin and Dess, 1996). Previous studies suggest that, in certain situations, firms exhibiting high levels of an entrepreneurial orientation (EO) will achieve superior performance to those possessing low levels of EO (Keh, Nguyen, and Ng, 2007; Li et al., 2008; Zahra, 1991). Indeed, studies indicate that increases in firm performance related to EO are sustainable over long periods of time (Wiklund, 1999), but that this relationship may be contingent on the environmental context in which the firm is operating (Lumpkin and Dess, 2001; Zahra, 1993; Zahra and Covin, 1995). Zahra (1996: 189) contended that innovative behaviors were critical to firm survival, arguing “success in today’s competitive environment requires a company to pursue a coherent technology strategy to articulate its plans to develop, acquire, and deploy technological resources to achieve superior financial performance.”

Porter (1980) posited that, in certain situations, firms could utilize proactive innovative behaviors in order to increase their competitive positioning in relation to other firms. Lieberman and Montgomery (1988) argued that innovative first-mover firms were able to gain significant advantages over follower firms. They defined such first-mover advantages in terms of the ability of pioneering firms to earn higher economic profits through such advantages as technological leadership and increased buyer switching costs (Lieberman and Montgomery, 1988). Given its importance researchers in many areas of study have report a plethora of studies regarding the subject. Most of this research has addressed OI’s from a variety of perspectives: strategic, market, entrepreneurial, organizational learning, company performance, leadership, and other (Deshpandé and Farley, 2004; Gumusluoglu and Ilsev, 2009; Han, Kim, and Srivastava, 1998; Hult, Hurley, and Knight, 2004).

What precisely is company innovativeness and how can one develop such desirable capability has been a challenging pursuit over the last decades. To avoid any conceptual

confusion, some studies have specifically differentiated OI from instances of innovation. Siguaw et al., (2006) and Subramanian (1996) highlighted the enduring nature and the need for a consistent ability to innovate over time. Avlonitis et al. (1994) proposed that OI represents a latent capacity of organizations and should not be directly linked with the adoption of specific innovations. To some authors innovativeness is an integral component of organizational culture with innovative capacity being its outcome (Hult et al., 2004; Hurley and Hult, 1998; Hurley et al., 2005). Thus, a company’s capacity to innovate results from its innovativeness and serves as a mediating variable between company innovativeness and competitive advantage and company performance. This capacity can be measured by the number of innovations an organization successfully adopts or develops. As such, innovativeness is not coupled with specific product innovations; rather, it reflects a cultural trait of the organization and the willingness to pursue new opportunities.

In the context of this study, OI is defined as the organizational environment support for the continuous creation of new ideas and products over time (Hurley et al., 2005; Salavou, 2004; Subramanian and Nilakanta, 1996). As defined here we should expect that organizations with higher levels of OI are more likely to implement or adopt a larger number of successful innovations (Hurley et al., 2005). Thus, according with the relevant literature, in general OI represents a desirable set of activities that can assume different forms in various organizational contexts (Moos et al., 2010; Siguaw et al., 2006; Wang and Ahmed, 2004). Lumpkin and Dess (1996) posited that OI reflects a company’s tendency to engage in and/or support new ideas, novelty experimentation and creative processes that may result in new products, services or technological process improvements. OI represents the organizational activities that ultimately produce visible and tangible innovative outcomes for the organization (Baer and Frese, 2002; Denison, 1996).

Because of the widespread belief that company innovativeness is an important determinant of company effectiveness as innovators and company business performance, some researchers have called for the development of a multidimensional measure for OI representing its complex nature, providing a comprehensive theoretical understanding of this concept and its dimensions. (Moos et al., 2010; Wang and Ahmed, 2004). Wang and Ahmed (2004) conceptualize OI as “an organization’s overall innovative capability” to produce innovative outcomes (p. 304), identifying five areas for innovative outcomes: product, market, process, behavior, and strategic innovation. Moos et al (2010) proposed a two-dimensional, directional perspective on OI differentiating input-oriented from output-oriented directions. The business literature

has recently paid a great deal of attention to the relatively new concept of organization absorptive capacity and its importance as a requirement for companies to manage and prosper in a business environment heavily dependent on innovation (Noblet et al., 2011; Popaitoon and Siengthai, 2014; Elbashir et al., 2011; Kohlbacher et al., 2013). Finally, Ruvio, Shoham, Vigoda-Gadot, and Schwabsky (2014) proposed another measure for OI where the construct is conceptualized to represent an organizational climate that facilitates innovative outcomes over time. In the same study five dimensions were identified and validated empirically: organization creativity, openness, future orientation, risk-taking, and proactiveness. The primary objective of this study, focused on the banking sector, is to retest each of these five independent variables as determinants of Banks' absorptive capacity to change and ability to innovate. In the following section each of these major independent variables and bank's ability to innovate are discussed in more detail.

## THEORETICAL BACKGROUND AND PROPOSED HYPOTHESES

### Dependent Variable – Bank Innovation Capacity or Innovativeness

As mentioned before, an organization innovation capacity has been discussed widely under a variety of terms such as Organization Innovativeness (OI), company entrepreneurial orientation (EO), and ability to innovate. The term Absorptive Capacity which has been originally defined as “the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends” (Cohen and Levinthal, 1990, p. 128) has been getting considerable attention from researchers more recently. In the realm of management research, absorptive capacity encompass a wide range of theories including organization learning (Lane et al., 2001), innovation (Tsai, 2001), a knowledge-based view of the firm (Zhao and Anand, 2009) and organization's dynamic capabilities (Zahra and George, 2002). According to the dynamic capabilities theory, firms need to adjust their resource base constantly to cope with the changing environment, thereby generating a competitive advantage (Teece et al., 1997).

As an organization's dynamic capability, absorptive capacity is embedded in organizational processes considered important enablers for successful organizational innovation and growth (Zott, 2003). Teece (2007) has emphasized the important role of strategic leadership in developing absorptive capacity and providing the necessary resources for this critical component of a company's managerial infrastructure vital for long term innovation.

In this study, we view absorptive capacity accordingly, as a conduit for knowledge from strategic leadership, competitive intelligence, technology support and management, and the necessary innovation processes themselves to flow through the entire organization affecting the decision making process of managers and lower workers alike to ultimately increase the likelihood of innovation success.

Cohen and Levinthal (1990) viewed absorptive capacity as a three-dimensional construct composed of identifying, assimilation, and exploiting external knowledge. Since then it has undergone several modifications and extensions (Lane et al, 2006; Lewin et al., 2011; Todorova and Durisin, 2007; Flatten, et al. 2011). Zahra and George (2002) proposed it as a four-dimensional construct which has been validated by several studies (Brettel et al., 2011; Flatten et al., 2011; Jansen et al., 2005). The four dimensions or capabilities are: 1) Acquisition which refers to the identification and intake of external knowledge potentially relevant to the firm. 2) Assimilation of the knowledge that has previously been acquired through its analysis, understanding, and interpretation. 3) Transformation which focuses on combining prior existing knowledge with newly acquired knowledge to update underlying processes. 4) Exploitation focused on fostering the commercial application of the new knowledge.

Zahra and George (2002) noted that the first two dimensions (acquisition and assimilation) are capabilities exploring potentially relevant knowledge, thus they are jointly called potential absorptive capacity, expressing a firm's ability to identify and gather external knowledge. The last two (transformation and exploitation) are capabilities exploiting relevant knowledge and realizing commercial gains from it, thus jointly they are called realized absorptive capacity, expressing a firm's ability to employ and leverage absorbed knowledge converting such knowledge into new or improved products and processes, (Flatten et al., 2011).

In this study we surmise that even though the infrastructure (equipment, employee recruitment, training, etc.) enabling potential absorptive capacity and realized absorptive capacity can be developed and employed separately, they must exist simultaneously in order to achieve the beneficial organizational results (Zahra and George, 2002). Indeed, an extension of the theoretical absorptive capacity concept is the work of Todorova and Durisin (2007) which assumes feedback loops between the potential and realized absorptive capacity concepts and propose that firms with higher levels of absorptive capacity will have an advantage identifying, gathering, assimilating, and exploiting further relevant knowledge in the future. Given its nature and components, we should expect that as a whole the absorptive capacity construct would be an

excellent representation for organization innovativeness or capacity to innovate.

### **Independent Variable – Organization Creativity**

Creativity and innovation have often been regarded as overlapping constructs however, creativity focuses on the generation of new ideas and innovation focuses on implementing and transforming new ideas into products, processes, and other organization changes (Amabile, 1997). The concept of newness in the context of organization creativity is essential to the concept of company innovativeness because it distinguishes innovation from mere change (Bharadwaj and Menon, 2000). Furthermore, not all new ideas are generated within the organization; some ideas are generated externally and only subsequently are adopted by the organization (Damanpour and Gopalakrishnan, 1998; Woodman et al., 1993). For that reason, the concept of creativity should include the adoption of new ideas imported from outside the company. Woodman, Sawyer, and Griffin (1993) defined organizational creativity as “the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system” (p. 293). This definition frames creativity as a subset of the broader domain of organization innovation (Amabile, 1997; Bharadwaj and Menon, 2000). Based on the above discussion we propose **H1: Bank creativity is directly related to its capacity to innovate.**

### **Independent Variable – Organizational Openness**

This variable refers to the organization’s flexibility and adaptability in responding to new ideas and changes. Organizational openness addresses whether organizational members are willing to consider or resist the adoption of innovations. Van de Ven (1986) referred to this tendency as the management of an organization’s cultural attention toward recognizing the need for new ideas and actions. Hence, organizational openness to new ideas and changes is viewed as a dimension of the OI construct. While some authors viewed openness as a personal level variable requiring individuals to be receptive to new views, tolerating ambiguity, and nontraditional thinking (Costa and McCrae, 1987), many researchers studied openness at the organizational level (Hult et al., 2004; Zaltman, Duncan, and Holbek, 1973). Thus, Hurley and Hult (1998) defined innovativeness in terms of “openness to new ideas as an aspect of a firm’s culture” (p. 44). Based on measures of group member behavior Taggar (2002) found a positive association between openness to experiment and creativ-

ity processes. Basically innovativeness within an organization reflects the firm’s fundamental openness to break away from established procedures (Kimberly 1979). A result of this tendency is idea generation, experimentation, and creativity so that new products and processes are developed (Lumpkin and Dess 1996; Tan 1996). Based on this discussion we propose **H2: Bank openness is directly related to its capacity to innovate.**

### **Independent Variable – Future Orientation**

This variable represents an organization’s preparedness for future environmental changes and positioning as reaction to such changes as they occur (Ford, 2002; Morgan and Strong, 1998; Venkatraman, 1989). Christensen (1997) described the trade-off between the utilization of knowledge acquired in the past (backward-looking) and the exploration of future opportunities (forward-looking) as the “innovator’s dilemma”. Most organizations tend to rely on past experiences instead of identifying future opportunities to hopefully enhance their competitive advantage (Ford, 2002). A forward looking perspective increases awareness of possibilities and allows managers to more effectively “think outside the box,” thus enabling them to find more innovative solutions to problems (Gavetti and Levinthal, 2000).

The innovation literature differentiates between incremental innovations based on modest changes based on the past compared with radical innovations motivated by future possibilities (Christensen, 1997). Associating companies’ future orientation with creativity and innovation, Ford (2002) posited that leaders raising concerns about the efficacy of current company products and processes are actually promoting consideration of longer time frames during the evaluation of alternative proposals, thus promoting creativity and change. Based on the above discussion we propose **H3: Bank future orientation is directly related to its capacity to innovate.**

### **Independent Variable – Risk Taking**

This variable has been defined by Miller and Friesen (1978) as the “degree to which managers are willing to make large and risky resource commitments.” This definition implies that risk-taking affects decision-making processes in resource allocation, the development of competitive strategies (Baird and Thomas, 1985; Morgan and Strong, 2003), and the choices of which new products to develop and in which markets to operate (Morgan and Strong, 2003; Venkatraman, 1989). Researchers have found positive associations among risk taking and other organization characteristics associated with innovation

such as proactiveness and openness to innovation (Rauch, Wiklund, Freese, & Lumpkin, 2004).

In general, since actual demand for specific products may be still relatively uncertain, companies generating new products based on technological innovations may be taking significant risks. Research on entrepreneurial orientation (EO) has shown that innovative and proactive company strategies are generally associated with risk taking (Lumpkin & Dess, 1996; Lyon et al., 2000). Researchers in EO and agency theory have shared interest in how risk taking affects company performance (Wiklund & Shepherd, 2003; Wiseman & Catanach, 1997). A meta-analysis by Rauch et al., (2004) regarding the relationship between EO and performance showed that across studies they were directly related. Rauch et al. (2004) found that the risk-taking dimension is positively related to performance, even if significantly smaller than other aspects of EO. Developing or adopting innovations is inherently risky because valuable outcomes are not ensured (Caruana, Ewing, and Ramaseshan, 2002; Lumpkin and Dess, 1996). The strategic management literature associates high levels of risk-taking with novelty, such as investing in unexplored technologies or introducing new products into new markets (Lumpkin and Dess, 1996; Rauch et al., 2009; Venkatraman, 1989). Because OI requires the development of new products or processes, risk-taking is a characteristic of highly innovative organizations. Based on this discussion we propose **H4: Bank risk taking willingness is directly related to its capacity to innovate.**

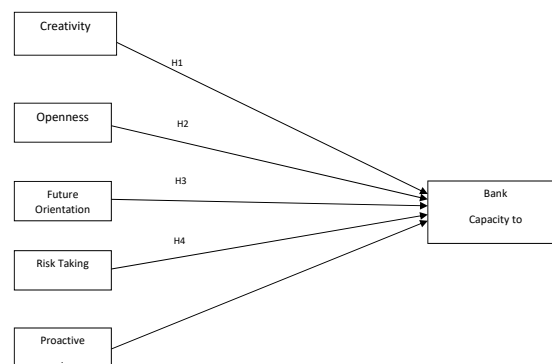
### Independent Variable – Organization Proactiveness

This variable represents an organization's pursuit of business opportunities in a broader context than its present conditions (Lumpkin and Dess, 2001; Venkatraman, 1989). Proactiveness enables companies to overcome inertia by taking initiative in exploiting emerging opportunities, in experimenting with changes to products and business processes, and trying to anticipate and act on future company needs (Dess, Lumpkin, and Covin, 1997; Rauch et al., 2009). The management, marketing, and entrepreneurship literatures tend to view proactiveness as central to innovative organizational behavior because of its emphasis on initiating innovation activities early (Dess et al., 1997; Lumpkin and Dess, 1996; Morgan and Strong, 2003).

Proactiveness refers to an organization's attitude or perspective characterized by actively seeking opportunities for introducing business process improvements and new products or services, ahead of competition and anticipating future demand to create change and shape the en-

vironment (Lumpkin and Dess, 2001). Because of this relatively higher uncertainty level surrounding proactive action, it requires managers extra effort convincing employees about the merit of the innovation at hand (Caruana et al., 2002) and makes proactiveness a particularly important component OI (Ruvio, Shoham, Vigoda-Gadot, and Schwabsky, 2014). Companies with strong customer orientation create superior customer value through earlier and more thorough recognition of their target markets' needs (Narver and Slater 1990). Customer needs and wants should be recognized more thoroughly and more quickly than competitors with the firm able to effectively handle the uncertainty existing with these new opportunities. When the opportunity for a competitive advantage emerges, company reaction time is often important. Lengthy reviews of the opportunity typically by less aware and unprepared firms may become detrimental to them. Thus, greater company proactiveness is likely to benefit firm performance. For all the reasons discussed above, we propose the final hypothesis **H5: Bank proactiveness is directly related to its capacity to innovate.**

**FIGURE 1**  
**THEORETICAL MODEL**



### STUDY METHODOLOGY

This section provides an overview of the questionnaire development process, the field-test data collection procedure, a brief description of the sample demographics, a detailed discussion of how the variables were measured, and the data analysis procedures.

### Questionnaire Development

As described in greater detail later in the Measurement section, for this study the questionnaire was comprised of many questions which have been used and validated by other authors before, regarding the independent variable (Ruvio et al., 2014), and the dependent variable (Guimaraes, Thielman, Guimaraes, and Cornick, 2016). For each item in the questionnaire a measuring scale was added

for data collection, as discussed in the next section. Some demographic variables such as bank type and assets, and IT sophistication were added to help detect any possibly response bias. Similarly, respondent demographics such as titles and knowledge about innovation projects were added to the questionnaire. Before widespread data collection six bank managers with innovation projects experience and personally known to the researchers were asked to review and test the questionnaire. Based on their feedback some rewording was needed for a few questions to improve readability. That is discussed further in the sections about Measurement, Validity and Reliability.

### Sampling and Data Collection

The point of entry into the participating organizations in this study were through the internal auditing directors/comptrollers (IA's) of 1000 banking organizations selected randomly from a national directory. An e-mailed questionnaire was used to collect data from the Internal Auditor Director (IA) of each bank branch. IAs were chosen as respondents because, from a corporate perspective, they are thought to be most aware of organization changes. Furthermore, the group is relatively homogeneous, a characteristic that strengthens internal validity of the data collection instrument used in the study. We felt that a survey of top managers who are more directly responsible for the corporate culture related independent variables studied here would have greater likelihood of bias. For similar reasons we avoided an opinion survey of lower level managers possibly more personally and directly involved with specific projects implementing organizational innovations. Participation was explicitly voluntary, and the cover letter assured confidentiality of the responses and that only summary information from the participants would be disseminated in any way. As a courtesy, a postage-paid envelope was provided. Through this procedure a total of 288 usable responses were received within the specified time of three weeks. This response rate should be viewed as acceptable for this type of exploratory field studies (Teo & King, 1996). As a courtesy to prospective respondents, the questionnaire was accompanied by a report from a previous study on the success factors for bank BPR projects. Respondents were asked to return the questionnaire by email directly to the researchers.

### Sample Description

Through the procedure just described, 1000 IAs were selected to participate in the study and 316 returned the questionnaire in time for data analysis. Twenty eight questionnaires were thrown out due to missing data or other irregularities. The remaining 288 usable questionnaires provide a response rate which is acceptable for studies of this type (Teo and King, 1996) and consistent with past ex-

perience with mailed surveys (George and Barksdale, 1974; Igbaria et al., 1991). Nevertheless, care was taken to assess the representativeness of the sample. Chi-square tests were used with a sample of non-respondents to check for the possibility of non-response bias. The results of this test support the conclusion that based on the banks' demographic variables reported below, those in the sample are on average not statistically significant from the ones in the target sample. The sample composition in terms of bank corporate-wide total assets, bank branch total assets, overall innovation management sophistication compared to competitors, and respondent level of knowledge about the bank innovation projects, is presented in Table 3a-d, respectively.

<b>3a Total Assets, Entire Bank Corporation</b>	<b>Frequency</b>	<b>%</b>
Less than \$500M	22	8%
\$500M-\$1B	28	10%
\$1B-\$10B	27	9%
\$10B-\$50B	32	11%
\$50B-\$100B	70	24%
\$100B-\$200B	61	21%
\$200B-\$500B	33	11%
Over \$500B	15	5%
<b>Total</b>	<b>288</b>	<b>100%</b>
<b>3b Total Assets, Specific Bank Branch</b>	<b>Frequency</b>	<b>%</b>
Less than \$50M	17	6%
\$50M-\$100M	52	18%
\$100M-\$200M	87	30%
\$200M-\$500M	79	27%
\$500M-\$1B	53	18%
<b>Total</b>	<b>288</b>	<b>100%</b>
<b>3c Bank's Overall Innovation Man- agement Sophistication Compared to Competitors</b>	<b>Frequency</b>	<b>%</b>
Greatly below average	6	2%
Below average	96	33%
About average	96	33%
Above average	68	24%
Greatly above average	22	8%
<b>Total</b>	<b>288</b>	<b>100%</b>

3d Respondents Knowledge About Bank Innovation Projects	Frequency	%
Very high (directly involved with bank innovation)	53	18%
High (Participated in many meetings about bank innovation)	116	40%
Moderate (Participated in some meetings about bank innovation)	97	34%
Low (Just hearsay about bank innovation)	22	8%
None	0	0%
Total	288	100%

### Variable Measurement

**Bank Innovation Capacity or Innovativeness** measures its "ability to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990, p. 128). Over time the measure has been expanded and modified. Zahra and George (2002) proposed it as a four-dimensional construct which has been validated by several studies (Brettel et al., 2011; Flatten et al., 2011; Jansen et al., 2005). We have adopted this measure for our study. The four dimensions or capabilities are: 1) Acquisition which refers to the identification and intake of external knowledge potentially relevant to the firm. 2) Assimilation of the knowledge that has previously been acquired through its analysis, understanding, and interpretation. 3) Transformation which focuses on combining prior existing knowledge with newly acquired knowledge to update underlying processes. 4) Exploitation focused on fostering the commercial application of the new knowledge.

To facilitate any future inter study comparisons along this very important construct, respondents were asked to use the same seven point scale used by earlier studies ranging from 1 = strongly disagree to 7 = strongly agree for rating each of the fourteen items in this measure. The specific items are:

**Acquisition:** Please specify to what extent your company uses external resources to obtain information (e.g., personal networks, consultants, seminars, internet, databases professional journals, academic publications, market research, laws and regulations).

- ▶ The search for relevant information concerning our industry is every-day business in our company.
- ▶ Our management motivates the employees to use information sources within our industry.

- ▶ Our management expects that the employees deal with information beyond our industry.

**Assimilation:** Please rate to what extent the following statements fit the communication structure in your company.

- ▶ In our company, ideas and concepts are communicated cross-departmental.
- ▶ Our management emphasizes cross-departmental support to solve problems.
- ▶ In our company there is a quick information flow, e.g., if a business unit obtains important information it communicates this information promptly to all other business units or departments.
- ▶ Our management demands periodical cross-departmental meetings to exchange information on new developments, problems, and achievements.

**Transformation:** Please specify to what extent the following statements fit the knowledge processing in your company.

- ▶ Our employees have the ability to structure and to use collected knowledge.
- ▶ Our employees are used to absorb new knowledge as well as to prepare it for further purposes and to make it available.
- ▶ Our employees successfully link existing knowledge with new insights.
- ▶ Our employees are able to apply new knowledge in their practical work.

**Exploitation:** Please specify to what extent the following statements fit the commercial exploitation of new knowledge in your company (Please think about all company divisions such as R&D, production, marketing and accounting).

- ▶ Our management supports the development of prototypes.
- ▶ Our company regularly reconsiders technologies and adapts them accordant to new knowledge.
- ▶ Our company has the ability to work more effectively by adopting new technologies.

Next, consistent with Ruvio, Shoham, Vigoda-Gadot, and Schwabsky (2014), the independent variables were measured using the scale 1=completely disagree, 2=somewhat disagree, 3=neither agree nor disagree, 4=somewhat agree, and 5=completely agree.

**Organizational creativity** was measured with the scale originally used by Siegel and Kaemmerer's (1978) and

Tierney, Farmer, and Graen's (1999). The five item scale was more recently used and validated by Ruvio, Shoham, Vigoda-Gadot, and Schwabsky (2014). The scale assesses the creative thinking and behaviors of the organizations' managers by asking respondents to express agreement/disagreement with the statements: In this organization: creativity is encouraged, managers are expected to be resourceful problem solvers, we are constantly looking to develop and offer new or improved services, our ability to function creatively is respected by the leadership, and managers are encouraged to use original approaches when dealing with problems in the workplace.

**Organizational openness**, consistent with Ruvio, et al. (2014), represents a subset of the original eight items (the four with the highest loading in the original scales and that reflected the perception of this dimension for the interviewees) used by Siegel and Kaemmerer (1978) and by Anderson and West (1998) to measure enacted support for innovation and open-mindedness to new ideas. Respondents were asked to express agreement/disagreement with the statements: This organization: is always moving toward the development of new answers, assistance in developing new ideas is readily available, open and responsive to changes, and managers are always searching for fresh new ways of looking at problems.

**Future orientation**. This variable represents the extent to which managers have a clear sense of direction and share it with their employees. This scale is based on Javidan and Waldman's (2003) vision dimension of charismatic leadership profile. Consistent with Ruvio, et al. (2014), it uses the four items with the highest loading in the original scale and with the best match to the perceptions of the interviewees. Respondents were asked to express agreement/disagreement with the statements: This organization: establishes a realistic set of future goals for itself, effectively ensures that all managers and employees share the same vision of the future, conveys a clear sense of future direction to employees, and has a realistic vision of the future for all departments and employees.

**Risk-taking**. This variable reflects the managers' disposition toward pursuing uncertain or risky decisions. Four items were selected from Jaworski and Kohli's (1993) 6-item risk-aversion scale. Consistent with Ruvio, et al. (2014) the four items with the highest loading in a previous Israeli study were selected (Rose and Shoham, 2002). Respondents were asked to express agreement/disagreement with the following statements: This organization: believes that higher risks are worth taking for high pay-offs, encourages innovative strategies, knowing well that some will fail, likes to take big risks, does not like to "play it safe."

**Proactiveness**. Originally Covin and Slevin's (1989) used this scale to measure the degree to which managers possess a proactive orientation. It included two reversed items, emphasizing "nonproactiveness." Consistent with Ruvio, et al. (2014), based on a pilot study these items were rephrased to reflect a proactive tendency. Further, one multifaceted item was split into two. Respondents were asked to express agreement/disagreement with the following statements: In this organization: managers are constantly seeking new opportunities for the organization, managers take the initiative in an effort to shape the environment to the organization's advantage, managers are often the first to introduce new products and services, and managers usually take the initiative by introducing new administrative techniques.

### Construct Validity

Several precautions were taken to ensure the validity of the measures used in this study. The independent variables were a priori thoroughly validated by Ruvio, Shoham, Vigoda-Gadot, and Schwabsky (2014). Also, many of the recommendations by Carmines and Zeller (1979) were followed. To ensure content validity, a thorough survey of the relevant literature was undertaken to understand the important aspects of each major variable and its components, and not neglect important dimensions of any variable. To further reduce the possibility of any non-random error, the main source of invalidity (Carmines and Zeller, 1979, p. 15), a group of four practitioners from different companies with extensive experience in managing business innovation reviewed the questionnaire for validity (measuring the phenomena intended), completeness (including all relevant items), and readability (making it unlikely that subjects will misinterpret a particular question). Some questions were reworded to improve readability; otherwise, the items composing each major variable remained as derived from the literature.

As proposed by Carmines and Zeller (1979), "construct validation focuses on the extent to which a measure performs in accordance with theoretical expectations" (p.27). To ensure construct validity, the theoretical relationships between the constructs should have been previously established, and these relationships hopefully have been empirically supported by different studies over time. As discussed earlier, the theoretical underpinnings of this study are relatively well established, with most of the items in each construct having been addressed before by several authors

### Construct Reliability

The measures for every construct relevant to this study have been used and validated independently before their



internal reliability was retested here. Carmines and Zeller (1979) identified four basic methods to assess a measure's reliability (re-test, alternative-form, split-halves, and the internal consistency methods) and discussed their strengths and limitations. The main advantage of the internal consistency method is that it requires a single test, in lieu of splitting or repeating of items. "By far the most popular of these reliability estimates is given by Cronbach's alpha" (Carmines and Zeller, 1979, p.44) which "in most situations provides a conservative estimate of a measure's reliability" (Carmines and Zeller, 1979, p. 45). The authors go on to say "that although more complex computationally, alpha has the same logical status as coefficients arising from the other methods of assessing reliability."

Several authors have proposed different acceptable levels of reliability coefficients. For example, Nunnally (1978) suggested a coefficient of 0.50 or higher would suffice. Srinivasan (1985) and Magal et al., (1988) contended that when using a not validated data gathering instrument in exploratory research, a reliability coefficient of 0.5 or higher is acceptable. Van de Ven and Ferry (1980) posited that in this type of research even a value of 0.4 or higher will be sufficient. In our case, the reliability coefficients of all the factors were higher than 0.70, which was proposed by Peterson (1994) as useful for more rigorous studies. As Table 3 indicates, the internal consistency reliability coefficients (Cronbach's alpha) for the scales used in this study

are all well above the level of 0.50 acceptable for exploratory studies of this type (Nunnally, 1978).

### Data Analysis Procedures

The average and standard deviation for each item (including the four components of innovation capacity) in the questionnaire were computed. Confirmatory factor analyses for the items in each main variable were conducted as the basis for their validation and as a prerequisite for assessing their internal reliability through the Cronbach's alpha coefficients presented within parentheses in Table 3. To test the proposed hypotheses, Pearson's correlation coefficients between the major study variables were computed and presented in Table 3. To identify the separate impact that each of the five organization culture traits being considered may have on the four components of the dependent variable (bank innovation capacity), they were processed separately in this analysis. Because of the possibility of multi-collinearity among the independent variables, a step-wise multivariate regression analysis was conducted to assess the extent to which each independent variable (culture trait) incrementally contributes to explaining the variance in the dependent variable. As found in prior studies, second order factor analysis indicates the four sub-factors comprising the dependent variable can be combined into one single factor measuring overall organization capacity to in-

**TABLE 3**  
**CORRELATIONS BETWEEN MAJOR VARIABLES**

		Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10
1	<b>Innovation Capacity</b>	4.02	1.13	(.74)									
2	<b>Acquisition</b>	4.12	1.26	.65**	(.69)								
3	<b>Assimilation</b>	4.05	1.19	.71**	.61**	(.73)							
4	<b>Transformation</b>	4.03	1.09	.63**	.42**	.58**	(.75)						
5	<b>Exploitation</b>	3.89	1.22	.69**	.39**	.46**	.60**	(.82)					
6	<b>Organization creativity</b>	2.95	1.11	.36**	.22**	.20**	.53**	.47**	(.88)				
7	<b>Openness</b>	3.06	0.98	.40**	.35**	.49**	.48**	.45**	.21**	(.84)			
8	<b>Future orientation</b>	3.14	0.95	.33**	.27**	.33**	.25**	.31**	NS	NS	(.90)		
9	<b>Risk taking</b>	2.44	1.21	.19*	.26**	.24**	NS	NS	.23**	NS	NS	(.85)	
10	<b>Proactiveness</b>	3.07	1.04	.45**	.31**	NS	.52**	.44**	NS	.31**	.28**	NS	(.81)

Numbers in parentheses diagonally are Cronbach's alpha reliability coefficients.

\* means  $p < .05$ , \*\* means  $p < .01$

novate which is used in the multivariate regression analysis shown in Table 4.

<b>TABLE 4 RESULTS OF MULTIPLE REGRESSION USING STEPWISE METHOD</b>		
<b>Dependent Variable: Bank Innovation Capacity</b>	<b>Incremental R<sup>2</sup></b>	<b>Significance Level</b>
<b>Independent Variables*:</b>		
1. Proactiveness	.20	.00
2. Openness	.11	.01
3. Organization creativity	.08	.02
4. Future orientation	.05	.05
5. Risk taking	.03	NS
<b>Total Variance Explained With Significance Level Less Than .05</b>	<b>.44</b>	<b>.</b>
* In the sequence in which they entered the regression equation.		

### RESULTS

Table 3 lists the means and standard deviations for the main research variables. As a group, in comparison with their main competitors, the banks in the sample are thought to be performing slightly above average in their overall innovativeness or potential for business innovation. The same is true regarding the cultural traits proposed as determinants of bank innovativeness except for the trait willingness to take risks. The relatively large standard deviations indicate significant differences between banks along all the major variables.

To test hypotheses H1-H5, Pearson’s correlation coefficients were computed and also presented in Table 3. All five independent variables show a direct relationship to success in business innovation, as defined in this study. Thus, based on these correlation coefficients, all five hypotheses are found significant at the 0.01 level or better, except the hypothesis (H4) regarding the cultural trait “willingness to take risks” which shows a correlation coefficient noticeably lower than the coefficients for the other hypotheses and with a significance level of .05.

Because of the possibility of collinearity among the independent variables, a stepwise multivariate regression analysis was conducted to assess the extent to which each

independent variable incrementally contributes to explaining the variance in the dependent variable. Table 4 shows that, dependent on the sequence in which the independent variable entered the regression equation, organization proactiveness explained 20 percent of the variance in bank capacity to innovate. The next three independent variables cumulatively explained another 24 percent of such variance with each independent variable making a contribution significant at the .05 level or below. The cumulative contribution from willingness to take risks in this case was not significant, thus it was dismissed.

### CONCLUSIONS, RECOMMENDATIONS AND FUTURE RESEARCH

The results provide significant evidence regarding the importance of the five components of OI to the success of bank’s business innovativeness. Given the importance of effectively implementing business innovation in these days of hyper competitiveness, banks’ capacity to innovate is an important prerequisite for their ultimately being more successful implementing necessary changes to their services, the business processes, and the organization itself. Therefore, it behooves bank managers to do whatever they can to improve their organization’s performance in the areas of organization creativity, openness, proactiveness, willingness to take risks, and orientation to the future.

To improve organization creativity top managers should encourage, be supportive and expect personnel to be resourceful problem solvers, to be continuously looking for opportunity to develop and offer new or improved services, to perform their jobs creatively and using original approaches to solve work related problems whenever possible. To increase organizational openness managers should be attentive that their bank as a whole as a whole and particularly its employees are always moving toward the development of new answers, assisting in the development of new ideas, readily available to cooperate with peers, subordinates and superiors, and open to new ideas and proposed changes. Further, it is important that managers are always searching for fresh new ways of looking at problems and opportunities.

To re-orient the organization toward the future there are also some prescriptions: that managers should pay special attention so that only challenging but realistic goals are set for individuals, departmental units, and the organization as a whole; that all managers and employees share the same vision of the future; that managers conveys a clear sense of future direction to employees; and that the bank has a realistic vision of the future for all departments and employees. Regarding risk taking, an area that many con-

sider anathema to respectable bankers, managers must create an environment where risk management becomes an integral part of planning and project management. Even for banks it is important that managers are not unduly shy about taking risks for the sake of creating an innovative company environment, developing an organization culture where employees understand that higher risks may be worth taking for higher payoffs, where managers encourage and support innovative strategies, knowing well that some ideas will fail, and that it is ok to take risks and not necessarily play it safe all the time, regardless of potential payoffs. Last, to improve bank proactiveness managers must be committed to continuously seek new opportunities for the organization, taking the initiative in an effort to shape the bank internal and external environments to the bank's advantage, being continuously prepared to introduce new ideas and services, and taking the initiative by introducing new and more effective administrative policies and techniques.

A quick glance at Table 3 shows some potentially interesting relationships between the organization cultural traits and some of the four stages (component variables) of firm innovative capacity. For example, a culture characterized by openness and proactiveness show the highest direct relationships with the first stage of the innovativeness process. Similarly, an open culture with future orientation tend to be associated (the two highest correlation coefficients) with the assimilation phase of the innovativeness process. Organization creativity and proactiveness show the strongest correlations with the phase of transformation and exploitation. Organization openness seems to be evenly important for all phases of the innovativeness process while risk taking willingness show no significant correlations with the transformation and exploitation phases.

The model tested in this study represents a major contribution to the literature because it was based on an extensive survey of the relevant literature and validated a new and improved measure for organization capacity to innovate which should be useful to study innovation success in the banking as well as other sectors. This study is a first attempt at empirically testing the importance of the selected organization culture traits as determinants of banks capacity to innovate. While their importance has been corroborated, the model tested here may need to be expanded to include other culture traits potentially important to company innovativeness or capacity to innovate. Besides adding to the list of potentially important cultural traits as independent variables, new research should explore the relationship of organization capacity to innovate as an intermediate variable to measures of innovation success in general, and specific measures of product/service innovation success, business process reengineering success, as

well as success implementing improvements in organization structure and culture.

Another important contribution from further research would be the identification and empirical testing of other variables which might moderate the relationships between the independent variables and success in business innovation. Indeed, prior research suggested that the sub-dimensions of OI (a.k.a. innovation or entrepreneurial orientation) may have differential relationships with other important organizational variables including another important dependent variable: organization performance (Kreiser, Marino, and Weaver, 2002; Lumpkin and Dess, 1996). In this case, the study would extend existing conceptualizations of OI or entrepreneurial orientation by developing a prescriptive model of the relationship between the sub-dimensions of entrepreneurial orientation and firm performance.

Last, Rauch et al. (2004) found that the risk-taking dimension is positively related to performance. This led them to suggest that the link between risk taking and performance is less obvious than the one between proactiveness or innovation and performance (Rauch et al., 2004). Specifically, the relationship between risk taking and performance seems to vary with context. The results from our study provides some corroboration for this proposition since a possible explanation for the non-significant correlations associated with willingness to take risk among banks may be due to their once famous risk aversion. Clearly, there is need for a follow up study looking at risk taking willingness and other specific cultural traits showing conflicting results. Such study will have to control for contextual variable such as company financial stability, industry sector (financial versus others), etc. Very likely the use of path analytic modeling techniques would be applicable for these studies involving more extensive models with moderating and mediating variables. The results should provide valuable information on other possible determinants for the ultimately two very important constructs of company innovation success and business performance.

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# A REVIEW OF LEADERSHIP STYLES THAT AFFECT PROJECT SUCCESS

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## ABSTRACT

*Leadership styles of project managers play an influential role in determining project success or failure. Consequently, project managers need to gain insights about the various leadership styles, traits, and behaviors, they exhibit in organizational settings. Using a content-analysis approach, this paper analyzes and categorizes empirical research-to-date that has examined the relationship between leadership styles and project success outcomes over the last decade. Results indicate that there are two leadership styles which are critical to successful project outcomes.*

*Keywords: Leadership; Transformational; Transactional; Project management; Content analysis*

## Introduction

Scholars and practitioners agree that leadership is a key factor for project success and crucial for creating environments that lead to higher levels of performance, the form and style of leadership that produces the best results are still under debate (Müller and Turner, 2010; Randeree and Ninan, 2011; Stagnaro and Piotrowski, 2013; Lundy and Morin, 2013). Leadership styles, traits and roles can vary quite drastically depending upon the situation, making it hard for project managers to choose what is best (Turner and Müller, 2005; Clarke, 2012). The cultural climate, diversity within the group, the industry in which the project takes place, and team performance can influence the effectiveness of a particular leadership style (Müller and Turner, 2007).

Leadership is the ability to build cohesive, goal oriented teams (Randeree and Ninan, 2011). Project managers may exhibit different patterns of leadership behaviors as they search for optimal leadership styles that will lead their

teams to project success (Jacques et al., 2007). A wealth of knowledge supports that leadership affects team performance success (Stashevsky and Koslowsky, 2006). Without the proper form of leadership, team performance can suffer, leading to project failure (Sivasubramaniam et al., 2002). Though the roles and responsibilities of a leader may vary depending on the situation, most if not all teams have a leader that guides them in a single direction (O'Connell et al., 2002). Leaders will direct the team to work together, establish the parameters of a project and then carry said parameters in accordance to the schedule, cost, and scope (Nixon et al., 2012). It is crucial for teams to have a central force for recognizing opportunities and making decisions (Elenkov et al., 2005). Groups can easily lose sight of their objectives and it is the leader's role to redirect them. Leaders also play a crucial role in guiding teams through conflict (Saeed et al., 2014). Leaders are responsible for resolving matters of conflict within a group in a quick and professional manner (Fisher, 2000). Leaders are also responsible for embodying the vision and culture of the organization in which they work (Kurland

et al., 2010). They are the ones who set an example for others to follow and help the organization define what project success means for the team (Nixon et al. 2012). It is the responsibility of the leader to help the group define what the finished product will look like and if success was reached in the end.

The aim of the paper is to provide an overview of the research on the type and characteristic of leadership that affect project success. It intends to identify and classify distinctive characteristics of leadership discussed in the literature and uses content analysis concepts on published empirical research during the last eleven years (2006-2017). Leadership theory is a vast field that pertains to many areas of business and management and is essentially a contingency theory for which certain behaviors and styles are more appropriate in certain settings. The objective of this paper has a more defined emphasis on project management. The focus is on leadership attributes, behaviors, and skills that make people successful in project management. The purpose is to conduct a content analysis review of published work to identify common themes that emerges that would be beneficial in the selection, training and the evaluation of project managers. This paper analyzes and categorizes empirical research-to-date that has examined the relationship between leadership styles and project management outcomes over the last decade.

The second section discusses theoretical background of the paper. The third section presents the methodology and resources used for the research. The fourth section provides a discussion of the content analysis which is followed by a concluding section.

## Theoretical Background

The first part of this section presents the theoretical background of project leadership and the second part discusses factors that define project success.

### Project leadership style and theory

This section discusses leadership styles and theories that have the most effect on project success. The transformational and transactional leadership theories applied to project management were first discussed in the 1970s (Anderson and Sun, 2017). The effectiveness of using a specific leadership style depends on the nature of the project, the type of cultural environment, and the personality of team members (Yang et al., 2011). In addition, a good leader requires good time management and communication skills. Project leaders play a vital role in linking information to a variety of stakeholders, motivating team members, aiming to meet project objectives through re-

ducing costs, time cycle and constrains (Turner and Müller, 2005; Lundy and Morin, 2013).

Burns (1978) introduced transformational and transactional leadership. Bass (1990) expanded on Burns' theory and defined transformational leadership as a style in which leaders elevated their team, accept the purpose and mission of the group, and looked beyond their own self-interests for the good of the group. Transformational leadership is built on the foundation of empowering those within the organization to achieve an exceptional quality of work and build supportive relationships (Yukl, 1989). Others viewed transformational leadership as a means by which corporations reinvent and revitalize the organization through institutional changes (Tichy and Devanna, 1987). In general, transformational leaders are responsible for enacting policies and/or exhibiting behaviors that promote change and guide their team towards a common goal (Bass, 1990).

Transformational leadership is a leadership style that emphasizes empowering and stimulating team members' intrinsic and extrinsic motivation. Leaders that emphasized a transformational style work with team members to provide guidance that translates into higher satisfaction level which may lead to better productivity (Burns, 1978; Podsakoff et al., 1990). Transformational leadership can be divided into two categories; "leader behaviors and "substitute for leadership" (Podsakoff et al, 1990). Leader's behavior dimensions include articulating vision, providing an appropriate model, fostering the acceptance of group goal, high performance expectations, providing individual support, and intellectual stimulation. The variables that "substitute for leadership" include general satisfaction, organizational commitment, trust, role clarity, role conflict, employee "in-role performance, altruism, courtesy, civic virtue, and sportsmanship (Podsakoff et al., 1990). Podsakoff et al. (1990) indicated that "substitutes for leadership" has some interaction with leader's behavior but does play significant role to support leader's behavior.

Transformational leaders differ from Transactional leaders by how they interact with their teams. By allowing others in the team to make decisions, the group increases follower productivity, group satisfaction, group member involvement, and their commitment to the group, (Hackman and Johnson, 1996). For the style to work, participation is needed from those within the group (Luthar, 1996). Members must buy into the idea of sharing the power and be empowered to contribute in the decision-making process (Gastil, 1994). Transactional leadership theory is considered a task-oriented leadership that focuses on reward-penalty based system (Burns, 1978, Bass, 1990; Müller & Turner, 2010). In a project management team, each member in the team has a set of objectives that

needs to be accomplished based on the task. The application of transactional leadership may be effective if the team members are provided with a clear objective of the project.

Another leadership style is called the Laissez Faire style (Turner and Müller, 2005). This style grants empowerment to the team members to make decision. It is suitable for experienced team members and for a project that does not need close monitoring. The nature of the project and its different stages may require a combination of different styles of leadership.

### Project success

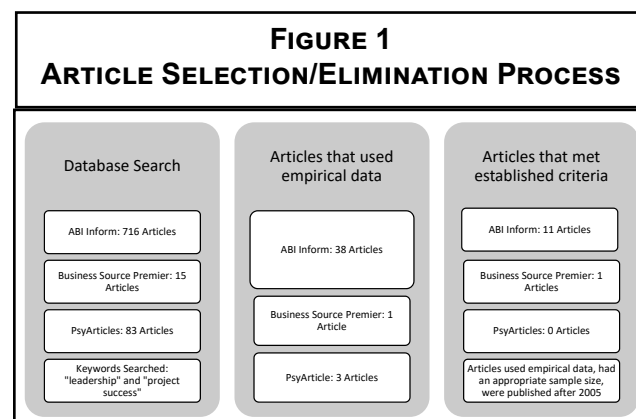
The traditional definition for “project success” states that projects should be completed on time, at or below the stated costs and to the quality standards set in the initial planning stages. According to Müller and Turner (2007), this definition is too simplistic. Munns and Bjeirmi (1996) compiled a list of variables and factors that dictate project success which includes objectives, project administration, third parties, relations with clients, legal agreements, politics, efficiency, conflicts, and profits. These and other factors such as customer satisfaction, effective communication, and scope, are known as Critical Success Factors (CSFs) for project success (Jugdev and Müller, 2005). CSFs are the factors needed to create an environment where projects can be managed efficiently to be successful (Kerzner, 1987). Even though these factors contribute to project success, it has been noted that they do not paint a complete picture as to why some projects are successful while others are not (Jugdev and Müller, 2005). For the purpose of our current research, we use a simplified definition of project success. A project may be deemed successful if it meets two criteria; the project is technically correct and performed in the manner intended, and the project meets the expectations of the clients (Geoghegan and Dulewicz, 2008).

### Research Methodology

A content analysis of the literature is conducted in this paper. The methodology of content analysis is an established technique in the project management literature (Achterkamp and Vos, 2008; de Bakker et al., 2010; Holzmann, 2012). This line of research has been expanded to developing procedures on how to compare observed variations from one study to another, deriving solutions for dealing with sources of bias such as unreliable measurements and sampling errors, and measuring the impact of effect size correlation (Rosnow and Rosenthal 1996). Content analysis links concepts together by exploring commonalities within the results of many studies and observations.

In this research, a review of empirical scholarly peer-reviewed articles published between the years of 2006 and 2017 was conducted. The first step involved a database search on scholarly articles using keywords in the following major electronic databases: ABI/Inform, Business Source Primer, and PsyArticles. The parameters/keywords used for the search included “project management”, “leadership”, and “project success”. The selected databases are the premier databases for scholarly published work in business. Between the three of them, they cover most of the totality of work peer-reviewed published in leadership and project management. Content analysis of the selected papers was adopted as an analysis instrument of the published literature on leadership and project management to highlight trends and patterns.

The databases’ search yielded a total of 814 articles. In the second step, the articles were perused to ascertain their relevance and the type of research methods utilized. The vast majorities of the articles (772 articles, 95%) were based on qualitative research methods or were irrelevant to the subject matter. Since this is a review whose objectives are to aggregate results from different empirical and statistical studies and to minimize the potential impact that bias has on qualitative research, all 772 qualitative articles were eliminated from further study. In the third step, the remaining 42 articles that used empirical data were downloaded and reviewed to ensure that leadership and project success were covered as the main focus of the papers. Articles were then classified on whether success factors for leadership style in project management was incorporated. During the selection/elimination process (Figure 1), 802 articles did not meet all the required parameters and were dismissed. In the end, only 12 of 814 articles were judged appropriate to be included in the study. Table 1 summarizes the findings and classifies the articles by results or themes, leadership style, and project success measurement.



**TABLE 1**  
**CONTENT CLASSIFICATION OF (SELECTED) ARTICLES**

Article	Purpose/Objective	Location(s)	Results/Emerging Themes	Leadership Style	Measurement of Project Success
Karlsen, J. T., and Gottschalk, P. (2006). Project manager roles in IT outsourcing. <i>Engineering Management Journal</i> , 18(1), 3-9.	To investigate different managerial roles that IT project managers use in outsourcing and termination projects	Norway	The role of the manager differs at each phase of a project.	Managerial roles	Participants ranked the managerial roles with respect to importance
Müller, R., and Turner, J. R. (2010). Attitudes and leadership competences for project success. <i>Baltic Journal of Management</i> , 5(3), 307-329.	To investigate project managers' attitudes and leadership competencies in achieving project success	United Kingdom and Sweden	Leadership competencies and attitudes are directly correlated to project success	Leadership in projects and project manager attitudes	Project success is based on project specific criteria and overall business factors
Thamhain, H. (2012). The changing role of team leadership in multinational project environments. <i>Revista De Gestão e Projetos</i> , 3(2), 4-38.	To investigate the influence of business environments and leadership styles on team performance	US, Brazil, and Europe	Project success depends on multidisciplinary efforts	Team leadership	Project success is measured by how well teams performed
Lee, J., Lee, H., and Park, J. (2014). Exploring the impact of empowering leadership on knowledge sharing, absorptive capacity and team performance in IT service. <i>Information Technology and People</i> , 27(3), 366-386.	To determine the mechanisms through which empowering leadership might influence team performance in IT services	Korea	Empowering leadership facilitates knowledge sharing and boosts the team's absorptive capacity thus allowing a team to improve their performance	Empowering leadership	Knowledge sharing and absorption capacity effects on team performance are measured
Edwards, G., and Gill, R. (2012). Transformational leadership across hierarchical levels in UK manufacturing organizations. <i>Leadership and Organization Development Journal</i> , 33(1), 25-50.	To investigate the effectiveness of transformational, transactional, and laissez-faire leadership across hierarchical levels in manufacturing organizations in the UK	United Kingdom	Transformational leadership is equally effective across hierarchical levels in organizations, whereas transactional leadership is not effective at the uppermost hierarchical levels in organizations, and laissez-faire is not effective at any hierarchical level	Transformational leadership, transactional leadership, laissez-faire leadership	Project success is measured by three dependent variables: Extra effort, leadership effectiveness, and follower satisfaction

Agrawal, N. M., and Thite, M. (2006). Nature and importance of soft skills in software projects leaders. <i>Asia Pacific Management Review</i> , 11(2), 93-102.	To assess the difficulties experienced by Indian IT project leaders in executing projects and the need for learning soft skills	India	Leadership soft skills must be honed to be a more effective project leader	Soft-skills	Factors are clustered into categories related to: management, leadership, business domain, self-related, customer, project and process management, and organizational role
Yang, L., Wu, K., Wang, F., and Chin, P. (2012). Relationships among project manager's leadership style, team interaction and project performance in the Taiwanese server industry. <i>Quality and Quantity</i> , 46(1), 207-219.	To investigate the relationship between project managers' leadership style and its effect on the team's performance	Taiwan	Transformational leadership influences team communication, team collaboration influence and project performance	Transformational leadership and transactional leadership	Project performance
Galvin, T., Gibbs, M., Sullivan, J., and Williams, C. (2014). Leadership competencies of project managers: An empirical study of emotional, intellectual, and managerial dimensions. <i>Journal of Economic Development, Management, I T, Finance, and Marketing</i> , 6(1), 35-60.	To define the attributes of effective modern-day project managers	N/A	Different industries favored different leadership styles	Emotional, intellectual, managerial, and transformational	Each competency has its own requirements
Clarke, N. (2010). Emotional intelligence and its relationship to transformational leadership and key project manager competences. <i>Project Management Journal</i> , 41(2), 5-20.	To investigate how emotional intelligence is related to transformational leadership in successful project outcomes	United Kingdom	Emotional intelligence influences transformational leadership	Transformational leadership and emotional intelligence	Project manager Competencies such as teamwork, attentiveness, conflict management, and communication
Aga, D. A., Noorderhaven, N., and Vallejo, B. (2016). Transformational leadership and project success: The mediating role of team-building. <i>International Journal of Project Management</i> , 34(5), 806-818.	To investigate team-building as an intermediary between transformational leadership and project success	Ethiopia	Transformational leadership plays a direct and an indirect role on project success, while team building is an intermediary between the two.	Transformational leadership, project success, Team-building	Fourteen items covering time, cost, performance, client use, satisfaction, and effectiveness
Maqbool, R., Sudong, Y., Manzoor, N., & Rashid, Y. (2017). The Impact of Emotional Intelligence, Project Managers' Competencies, and Transformational Leadership on Project Success: An Empirical Perspective. <i>Project Management Journal</i> , 48(3), 58-75.	To investigate the impact of Emotional Intelligence, project manager competencies, and transformational leadership on project success	Pakistan	Leaders who exhibit transformational leadership behavior are effective and successful leaders.	Transformational Leadership	Project completed on time, meet budget, satisfy quality, satisfaction of team members, achieve project's objective and meet customer satisfaction.
Yang, L., Huang, C., & Wu, K. (2011). The association among project manager's leadership style, teamwork and project success. <i>International Journal of Project Management</i> , 29(3), 258-267	To investigate the effect of teamwork on project performance. Measurement of project leadership style of project success was included.	Taiwan	Increased level of leadership may enhance relationship among team members.	Transformational and Transactional	Schedule, cost and quality performance.



## Results

This section presents the content of the findings. It includes the type of leadership style and the measurement of the project success.

As summarized in Table 1, the findings of the papers' content analysis conclude that leadership plays a crucial role in project success. Though the style of leadership and execution of leadership roles varied, the overall importance was abundantly clear. The key emerging themes and the summary of the content analysis study; pertinent to leadership and project success; from each of the surveyed twelve articles listed in Table 1 are briefly highlighted in the following section.

Karlsen and Gottschalk (2006) investigated how the role of leadership influenced project success. After surveying 21 leaders in the field, it was determined that the environment of the project defined the type of leadership style that was most effective in IT projects being outsourced. There were five roles that leaders could choose in different projects, including leader, resource allocator, spokesman, entrepreneur, monitor, or liaison. In Client Outsourcing Projects and Client Termination Projects the spokesman role was the most effective, and in Vendor Outsourcing Projects and Vendor Termination Projects the role of resource allocator was the most effective.

Müller and Turner (2010) stated that the project manager's personality, which was defined as their leadership competencies and their attitudes around project success criteria, had an effect on project success. Leadership competencies, in particular the management of resources and strategic perspective, correlated directly with project success. Moreover, the attitudes that leaders have towards customers and end-users had a spillover effect which lead to higher level of project success.

Thamhain (2012) found that it was the duty of the manager to foster a work environment that was supportive of team members. The data showed a statistical correlation between factors that satisfy personal and professional needs and project team performance. Technical skills or good expertise alone are not sufficient, but a broad range of skills and organizational support are needed to accomplish goals. This requires a great deal of interaction amongst management and support from all levels of the project team. Sharing power and empowering team members were also important for successfully implementing projects at any phase.

Lee et al. (2014) collected data from 315 individuals. The results indicate that in the field of IT, the absorption capacity of the team and knowledge sharing improve team performance which leads to higher levels of project suc-

cess. To accomplish both, empowering leadership works better than any other form of leadership. Furthermore, the paper shows that empowering leadership explained more than 40% of variance in the absorption capacity of teams.

Edwards and Gill (2012) found that transformational leadership is equally effective across most hierarchical levels in manufacturing organizations, while other forms of leadership are not. Transformational leadership is also conducive to extra effort, effectiveness and satisfaction from the team. The only time transformational leadership does not have a drastic effect on performance is at the lower levels of an organization. The study also found that Transactional leadership is ineffective at most hierarchical levels of a manufacturing organization especially the uppermost levels. Laissez-faire proves to be the least effective of them all and leads to the least amount of productivity.

Agrawal and Thite, (2006) surveyed participants on the obstacles and difficulties encountered when executing projects. They found that an overwhelming number, over 75%, deemed leadership difficulties or managerial difficulties as the cause of projects being unsuccessful. The study determined that leadership soft skills must be honed and executed properly for leaders to reach their full potentials. Once they mastered those skills, leaders would have the ability to be more effective and this could lead to higher levels of project success.

Yang et al. (2012) used 196 surveys and regression analysis to demonstrate a correlation between leadership and project performance. The researchers measured the effect of transactional and transformational leadership on project performance. They found a significant positive relationship between transformational leadership, team collaboration and team communication. Team collaboration and team communication correlate positively with project performance, suggesting that project success can be achieved with stronger team communication combined with greater team collaboration and that transformational and not transactional leadership leads to higher levels of project success.

Galvin et al. (2014) examined the leadership styles of effective project managers. Thirty-eight managers were selected to complete a survey that identified their leadership styles as intellectual, managerial, or emotional. They found that most leaders, approximately 68.4%, displayed managerial leadership styles which consists of five competencies; communication engagement, resources management, empowerment, development, and achievement.

Clarke (2010) examined the effect of emotional intelligence on project success. The empirical research and statistical analysis suggested that there is a relationship

between emotional intelligence abilities and project managers' competencies. The study found a statistically significant relationship between emotional intelligence abilities and transformational leadership after controlling for both cognitive ability and personality. This suggests that emotional intelligence influences a leader's ability to demonstrate transformational leadership capability. When enacted correctly, emotional intelligence and transformational leadership lead to higher levels of project success.

Aga et al. (2016) investigated the relationship between transformational leadership and project success by surveying project managers in Ethiopia. The researchers found a positive association between a project performance and the transformational leadership style exhibited by project managers. Transformational leadership motivates and inspires team members to work towards a common goal of project success. Overall, usage of transformation leadership techniques results in efficient and effective projects, and increased stakeholders' satisfaction.

Maqbool et al. (2017) examined the effect of construction's manager emotional intelligence, managerial competencies, and transformational leadership style on project success. The total number of respondents was 359 (83.8% response rate). The results indicated that managers who exhibit transformational leadership behavior are effective leaders.

Yang et al. (2011) examined the effect of teamwork on project performance. In addition, the study also investigated the relationship among the project manager's leadership style, team work, and project success. The results indicated project performance is effected without proper leadership. Both transformational and transactional leadership style have significant effect on project performance.

Based on the results of the study, two types of leadership styles; transformational leadership and transactional leadership; emerged as being important for project management success. Both types of leadership emphasize team effort, participation, and collaboration. Transformational leaders use their influence to alter the behavior of those within the group to achieve their purpose. On the other hand, transactional leaders share their power and allow the group to determine the best course of action. Both leadership styles have been studied over the years to measure the influence they have on teams. Based on the reviewed results, we believe that the appropriate mix of leadership styles needed for project success may differ depending on the stage or life cycle of the project. In the next section, the importance and the effect of the transformational and transactional leadership styles on the life cycles of the project are discussed.

### **Discussion-Leadership Style and Project Life Cycle**

Effective project leadership begins with selecting and implementing an appropriate leadership approach, one that matches the needs of each stage of the project. Project management traditionally has five life-cycle; initiation, planning, execution, control, and closing (PMI, 2013). The initiation stage is when the project managers, stakeholders, and the team come together to examine the proposed project (PMI, 2013). Consensus and group participation is vital during this time. Transactional leadership plays a key role since the facilitation of participation is an essential characteristic of this form of leadership (Chemers, 1984). Transactional leaders ensure that all the necessary parties are committed to the success of the project and fully participate throughout the process. During this phase of the project, it is important that leaders motivate their teams and create a shared professional vision (Agrawal and Thite, 2006). The need for transformational leadership is high to medium at this stage. While the group is forming and creating the parameters for the project, transformational leadership will help the group define the vision and mission. At this stage motivation can be unpredictable and a clear direction is important (Hellgren and Stjernberg, 1995; Floricel and Miller, 2001). Moreover, stakeholders play a significant role in this stage, as the key holders for the project. Karlsen and Gottschalk (2006) indicated that project leader plays significant role on giving clear information to stakeholder and making sure they are pleased with the progression of the project. Another important characteristic of transactional leadership is the emphasis on rewards-penalties. Leaders can bestow rewards upon achieving the objective of the project. Clear communications about expectations using transactional leadership and shared vision using transformational leadership technique are the combinations that are needed at this stage (Aga et. al, 2016).

During the planning stage, the project manager and the team create a schedule of tasks and resources needed to complete the project (Floricel and Miller, 2001). Furthermore, this stage involves identifying specific objective and timetables for each small group within the project; intervention from leaders are expected to ensure that the goal is aligned with the overall project objective at the organizational level (Edwards and Gill, 2012). Transactional leadership thrives in this stage, as it encourages teams to make sacrifices, be courageous in their decisions, follow the vision set for in the previous stage, and participate in achieving project success (Cho and Park, 2007). Transformational leadership support is needed at this stage as well. Using charisma and influencing the behavior of the team can help make sure the motivation level stays intact and team members will move forward with the individual goal (Aga et al., 2016).

During the execution phase, the project manager coordinates the team and makes sure the tasks and resources are being used in the way they were intended (Hellgren and Stjernberg, 1995). In this stage, transformational leadership is the most effective because team members should be elevated to accomplish their specific goals and objectives (Bass, 1990). By giving them the tools and motivation they need, project managers empower their teams and elevate their productivity, increasing their chances of achieving project success. It also enhances the relationship among team members and fosters better communication, collaboration, and cohesiveness throughout the team (Yang et al. 2012). When executing a project, tasks must be completed and the leader must maintain a sense of control while also relinquishing some power to their team (Thamhain, 2012). To accomplish this, leaders must empower their workers with the knowledge and skills needed to succeed using a combination of skills and techniques (Lee et al., 2014). Successful execution depends on clear communication and trustful interaction between team members and leader (Braun, 2013; Müller and Turner, 2010).

In the control phase, the project manager monitors the project and handles any issue that the project may face. This phase favors transformational leadership because leaders must have the ability to communicate a shared vision and change the team’s behavior at any moment to reach the stipulated goals. To do this, they must inspire those in the group to go above and beyond to succeed and do so in a selfless manner (Hartog et al., 1997). The project manager empowers the team to complete common goals using different problem-solving techniques (Aga et al., 2016). Knowledge sharing that is encouraged by team leader will foster performance and may increase the motivation level of the team members (Lee et al., 2014).

Commitment by team members is critical at this stage, transformational leadership has a stronger positive effect on commitment than transactional leadership (Tyssen et al., 2014). Using transformational leadership is a way to maintain individual support and stimulate performance (Edwards and Gill, 2014).

In the final stage of closing, the deliverables of the project are completed and all tasks are brought to an end. Transformational leadership works well as it encourages communication between all the parties involved (Yang et al., 2012). It is important that all parties communicate to ensure that the objectives that were set in the beginning of the project were met in the manner agreed upon in the planning phase. During the closing phase, strong leadership is needed to evaluate results and strategy, financial analysis, and review new contracts (Karlsen and Gottschalk, 2006). Transactional leadership is also important as it encourages the full participation of all parties involved. The combination of the two leadership styles should be used with an emphasis on transformational leadership as it gives leaders the ability to change their skills and traits based on the needs of their team (Galvin et al., 2014). Transformational leaders provide inspiration to workers, set goals, and facilitate understanding at all phases resulting in a higher likelihood of project success (Maqbool et al., 2017; Clarke, 2010).

The previous discussion is summarized in Table 2. Table 2 is a matrix adopted from Project Management Institute Book (PMI, 2013) which is updated to reflect leadership style at each stage of the project according to the content analysis of the literature. Prabhakar (2005) suggested there exists a relationship between switches in leadership style and a high success level on a project. Based on our findings, transformational leadership is shown to be effective through all phases of a project while transactional

**TABLE 2  
LEADERSHIP STYLE MATRIX**

Project Phase	Leadership Style		References
	Transformational	Transactional	
	Level of involvement		
Initiation	High	High	Chemers (1984), PMI (2013), Hellgren and Stjernberg (1995), Floricel and Miller (2001), Agrawal and Thite (2006), Yang et al. (2012).
Planning	Medium	Medium	Cho and Park (2007), Floricel and Miller (2001), Agrawal and Thite (2006), Yang et al. (2012).
Execution	High	Medium	Thamhain (2012), Yang et al. (2012), Aga et al. (2016).
Control	High	Low	Clarke (2010), Aga et al. (2016)
Closing	High	Medium	Karlsen and Gottschalk (2006), Clarke (2010).

leadership is more effective at certain phases than others (Gill, 2012).

## Conclusion

The study reviewed the recent body of knowledge in the field of leadership in project management. The focus of the survey was on the empirical based research published on the subject in scholarly journals spanning the last decade (2006 to 2017). The review classifies recent empirical research by highlighting leadership styles and traits practiced in project management and offers suggestions on the best leadership type and behaviors that are preferable at each stage of a project.

However, the current inquiry has some limitations. First, the study was limited to only empirical research, excluding a vast array of qualitative research on the subject matter. Second, the search of scholarly articles was limited to only four databases, thus possibly leaving out an array of work that did not appear on these mainly business databases.

Overall, the study provided a valuable understanding of the effect of leadership styles and manager' traits on project success. The paper serves as a taxonomic review for further research into the subject.

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# FINANCIAL LITERACY, ACCOUNTING LITERACY, AND THE AUDIT COMMITTEE: WHERE ARE THE ACCOUNTING EXPERTS?

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## ABSTRACT

*Corporate audit committees play a critical role in overseeing the financial reporting process. To ensure that audit committee members can effectively perform this function, NYSE and NASDAQ rules require that all members be “financially literate.” Also, the Sarbanes-Oxley Act of 2002 established the role of “audit committee financial expert,” requiring a deeper level of expertise. Many argue that, given the accounting oversight expected of audit committees, financial literacy should be more accurately viewed as “accounting literacy.” Prior research demonstrating the benefits of additional accounting expertise on audit committees supports this view. This study examines the extent to which audit committees as a whole possess accounting knowledge and expertise. The results reveal that while most audit committees have at least some accounting expertise, few have more than one accounting literate member. A comparison with audit committee membership from a decade ago reveals only a modest increase in accounting literacy. Given the documented benefits to firms of increasing the accounting expertise of their audit committees, the relative lack of accounting literacy raises questions about the effectiveness of audit committees in monitoring financial reporting.*

## Introduction

Recent years have seen increased emphasis on the ability of corporate audit committees to effectively monitor financial reporting. One aspect of that focus has been to ensure that directors serving on the audit committee possess the knowledge and skills needed to effectively carry out their duties (Giancomino et al. 2009). Both the NYSE and NASDAQ exchanges now require audit committee members to have a basic level of financial literacy, while the Sarbanes-Oxley Act of 2002 (SOX) established the role of an “audit committee financial expert” possessing a deeper level of financial expertise (Archambeault and Friedl 2007).

Coates et al. (2007) argue that financial literacy in the context of an audit committee’s responsibilities should be more accurately termed “accounting literacy.” Morse (2004, p. 22) quotes accounting researcher Dr. Roman-Weil as saying:

(T)o be financially literate, every person on an audit committee should understand the transactions that require management to make important accounting judgments, the accounting issues management has to confront in explaining the transactions, the decisions management made and why, and the potential implications for financial

reporting of management’s choices.

Guidance from public accounting firms (PriceWaterhouseCoopers 2011; Deloitte 2018) and academic research (e.g. Bilal et al. 2018; Abernathy et al. 2014) also emphasize the importance of audit committees having expertise in accounting.

It is not clear that corporate audit committee members actually do possess sufficient accounting expertise. Malek (2013) argues that many do not and proposes intensive training as a corrective remedy. Coates et al. (2007) also contend that audit committee members lack sufficient accounting knowledge. Morse (2004, p. 22) quotes Weil on this point:

Financial literacy is the ability to understand the important accounting judgments management makes, why management makes them, and how management can use those judgments to manipulate financial statements. You’d think it would be a basic requirement on audit committees, but it’s unbelievably scarce.

If audit committees lack this necessary expertise in accounting, their ability to effectively oversee the financial reporting process will be limited. Financial statements



will be less reliable, and less useful to investors and creditors, as a result.

This study investigates the accounting expertise of audit committees. Using a metric developed by Coates et al. (2007), the current accounting literacy of audit committees as a whole is assessed, as well as the extent of changes in literacy over the past decade.

The remainder of the paper is divided into five sections. The first section summarizes current laws and regulations concerning audit committees and financial literacy. The second section discusses public accounting firm recommendations and academic research emphasizing the importance of accounting literacy as a factor in overall financial literacy. The third section presents the research methodology of this study, while the fourth provides the results. The paper closes with a summary and suggestions for future research.

### **Audit Committee Financial Literacy What are the Rules?**

The Sarbanes-Oxley Act of 2002 (SOX) requires firms to disclose whether or not at least one member of their audit committee is a financial expert. Trautman (2013) summarizes the SEC rules implementing this requirement. A financial expert is one who has:

- ▶ An understanding of GAAP and financial statements;
- ▶ The ability to assess the general application of GAAP to accounting for estimates, accruals, and reserves;
- ▶ Experience preparing, auditing, analyzing, or evaluating financial statements of a breadth and level of accounting complexity generally comparable to that expected to be present in the company's financial statements (or experience actively supervising others engaged in such activities);
- ▶ An understanding of internal control over financial reporting; and
- ▶ An understanding of audit committee functions

Individuals might acquire these attributes through:

- ▶ Education and experience 1) in a position as a principal financial or accounting officer, controller, public accountant, or auditor, or 2) in a position involving similar functions;
- ▶ Experience in actively supervising a principal financial or accounting officer, controller, public ac-

countant, or auditor (or an individual performing similar functions);

- ▶ Experience in overseeing or assessing companies or public accountants in the preparation, auditing, or evaluation of financial statements; or
- ▶ Other relevant experience.

These criteria do not apply to all audit committee members, just the designated expert. Concerns have been expressed that, given the audit committee's focus on financial reporting, these requirements are too broad, allowing those without much accounting knowledge to qualify as audit committee financial experts (ACFEs). Afterman (2016) notes that the "experience in overseeing" provision opens the ACFE designation to CEOs with little direct accounting background. These concerns are echoed by Dennis Beresford, who has served on the board of directors of the National Association of Corporate Directors and as a member of the PCAOB Standing Advisory Group, and is quoted by Trautman (2013, p. 229) as stating:

In particular, I'm concerned that the rules allow former CEOs and others who have supervised finance functions but not performed them themselves to qualify as ACFEs. While some of these individuals are outstanding audit committee members, others simply don't speak GAAP and GAAS sufficiently to understand the nuances of complex and sophisticated accounting, auditing, internal controls, SEC regulations, etc. to be fully effective audit committee members, let alone experts.

Both the NYSE and NASDAQ exchanges also have requirements regarding members of the audit committee. The NYSE requires (NYSE, section 303A.07) that:

Each member of the audit committee must be financially literate, as such qualification is interpreted by the listed company's board in its business judgment, or must become financially literate within a reasonable period of time after his or her appointment to the audit committee. In addition, at least one member of the audit committee must have accounting or related financial management expertise, as the listed company's board interprets such qualification in its business judgment.

No precise definition of "financially literate" is offered and the requirement that one member have "accounting or related financial management expertise" is broad enough to include many directors without an accounting background.

NASDAQ rules (NASDAQ, section 5605(c)(2)(A)(iv)) are somewhat more specific, requiring audit commit-

tee members “to be able to read and understand fundamental financial statements, including a Company’s balance sheet, income statement, and cash flow statement.” However this falls well short of explicitly calling for audit committee members to possess any in-depth accounting knowledge.

The regulatory environment described above does not require audit committee members to possess any extensive knowledge of, or experience in, accounting. Whether financial literacy should be interpreted to mean accounting literacy is discussed in the next section.

### **Should Financial Literacy Require Accounting Expertise?**

Malet (2013, pp. 7-8) argues that financial literacy necessarily entails a substantial level of accounting expertise:

(F)inancial literacy will occasionally mean understanding control systems, disclosure requirements, and audit practice and procedure. It may include ability and confidence to pursue the “red flags” that lurk in the lines of suspect transactions. It will sometimes include sensitivity to the issues and nuance in alternative approaches to esoteric accounting issues.

Coates et al. (2007, p. 179) argue that, in the context of the committee’s responsibilities to restrain management’s manipulation of the financial statements, financial literacy requires the audit committee to be able to ask and understand the answer to questions such as:

Do I understand . . . my enterprise’s use of hedge accounting? Or, of sales treatment for financial asset transfers? Or, of sales treatment of goods leased in capital leases?

Did management make an estimate (or change an accounting method) to achieve a financial reporting objective – that is, meet an earnings target?

Answering questions such as these clearly requires a level of accounting sophistication beyond that called for by the stock exchanges and the SEC. Coates et al. (2007, p. 188) argue that this level of accounting knowledge is severely lacking among audit committee members. They report the results of an accounting quiz geared to the level of an introductory MBA accounting course. The quiz was given to corporate directors at conferences over a number of years.

The quiz scores did not demonstrate a great deal of accounting knowledge. The median score on this quiz is about 8 correct out of 25, and this

score has remained constant over several years of testing. The results point to financial illiteracy.

Coates et al. (2007) are not alone in stressing the importance of accounting knowledge on the audit committee. For example, PriceWaterhouseCoopers (2011, p. 89) notes:

Regardless of applicable rules, audit committees need members with sufficient knowledge of accounting and financial reporting to enable them to understand the financial reporting process, financial statements, and related business issues. With the increasing complexity of business transactions and accounting and reporting principles and practices, members need to be positioned to ask the right questions and probe as necessary.

Deloitte (2018, p. 6) echoes the point:

Audit committees should review their composition periodically to confirm that members have the knowledge and experience they need to be effective. In addition to industry knowledge, members should have a strong grasp of internal control over financial reporting and financial reporting and accounting issues such as revenue recognition, pensions and other postemployment benefits, financial instruments, and critical accounting policies.

Academic research also highlights the importance of accounting expertise to audit committee effectiveness. For example, Bilal et al. (2018) conducted a meta-analysis of 90 published studies and found a positive relationship between accounting financial expertise on the audit committee and the quality of a firm’s reported earnings. Also, Abernathy et al. (2014) discovered a positive link between accounting financial expertise on the audit committee and the timeliness of firm financial reporting. Interestingly, they found (p. 283) that while “accounting expertise gained from public accounting experience is associated with timelier financial reporting; however, accounting expertise gained from CFO experience is not.”

Raghunandan and Rama (2007) note that researchers commonly use the number of audit committee meetings as a publicly observable proxy for the diligence with which the committee carries out its responsibilities and investigate factors influencing the number of meetings. They found a significant, positive association between meeting frequency and the proportion of accounting financial experts on the audit committee. They did not observe such a relationship between meeting frequency and nonaccounting expertise.

Krishnan and Visvanathan (2009) examined audit committee characteristics and audit fees and found that audit fees were negatively related to accounting financial expertise. However, there was no significant relation between fees and nonaccounting financial expertise. They conclude (p. 141) that lower audit fees indicate “that auditors perceive that only accounting financial expertise contributes to increased monitoring by the audit committee and, thus, mitigates the risk of governance failure.”

Taken together, academic research and guidance from public accounting firms clearly show the importance of audit committees possessing significant accounting expertise. The next section details the methodology used to assess the whether corporate audit committees possess that expertise.

### Methodology

#### Assessing Audit Committee Financial Literacy

This study employs a metric of financial literacy for the audit committee as a whole developed by Coates et al. (2007). Their approach involves reviewing the biographical information of each individual audit committee member and assessing his or her financial literacy, using the following four-category scale (higher scores represent greater financial literacy):

- 4–Career path includes accounting function, such as accountant or controller, or provides some evidence of accounting expertise.
- 3–Career path includes financial executive function, such as treasurer or investment banker, but no explicit accounting functions.
- 2–Career path includes nonfinancial business executive function, including chief executive officers (CEOs) without explicit accounting functions.
- 1–Other career paths, such as nonbusiness executive, nonaccounting academic, nonprofit executive, politician, diplomat, or former government bureaucrat.

Coates et al. (2007) then compute the overall financial literacy of an audit committee by aggregating the literacy score of each individual committee member. For example, a committee financial literacy score of 444 would indicate

that each individual member of the audit committee possessed accounting expertise, as evidenced by experience in public accounting, etc. A committee score of 111 would result from all audit committee members lacking accounting or business experience. Since not all audit committees are of the same size, comparability between firms is maintained by using only the top three scores of members of larger audit committees. For those few audit committees with less than three members, a score of 1 is used to make up the shortfall. A two person audit committee comprised of practicing CPAs would thus be assigned a financial literacy score of 441. Coates et al. (2007) adopted this scoring method in place of computing an average audit committee literacy score because of the importance of each individual committee member’s literacy level. As they put it (p. 180), “. . . one member with score 4 is better than 5 members with score 2.”

#### Sample Selection

To ensure a broad cross-section of firms in the sample, companies were selected from two sources. First, 100 firms were randomly selected from the S&P 500 Index. Another random sample of 100 companies was then drawn from the Russell Microcap Index, which consists of 2,000 of the smallest publicly held firms in the country. The resulting sample of 200 companies thus represents both the largest and smallest public firms in the United States.

Following Coates et al. (2007), biographical information provided in each firm’s proxy statement was used to assess the financial literacy of each audit committee member. The 200 sample firms reported a total of 810 directors serving on audit committees in 2017. For purposes of comparison, the same information was taken from firm proxy statements filed in 2007. Those same 200 firms had a total of 756 audit committee members in 2007. Individual director rankings were then aggregated into an overall audit committee literacy score.

Literacy Scores	Number of Firms		
	Full Sample	S&P 500	Microcap
444	7	5	2
443	18	10	8
442	18	4	14
441	0	0	0
433	22	13	9

432	30	14	16
431	2	0	2
422	30	12	18
421	4	0	4
411	0	0	0
333	13	10	3
332	16	11	5
331	2	0	2
322	27	13	14
321	7	5	2
222	4	3	1
221/ 211/ 111	0	0	0
at least one "4"	131	58	73***
more than one "4"	43	19	24
***Difference between S&P500 and Microcap firms significant at p<.01 level			

Table 1 summarizes the audit committee financial literacy scores for 2017. As the Table indicates, 131 firms (65.5%) had at least one member with the strong accounting background required for a literacy score of "4". Microcap firms (73%) were significantly more like to have at least one "4" serving on the audit committee than were S&P 500 firms (58%). Fewer audit committees were observed with more than one "4" as a member – only 43 firms (21.5%) had two or more such members. Finally, only seven of the 200 sample firms (3.5%) had at least three audit committee members qualifying for a literacy score of "4". However, a significant number of firms (34.5%) had no members at all with accounting expertise. Given the advantages of accounting experts as audit committee members, the relatively low number of audit committees with such expertise, particularly among S&P 500 firms is somewhat surprising.

<b>TABLE 2 AUDIT COMMITTEE LITERACY SCORES 2007 PROXY STATEMENTS</b>			
Literacy Score	Number of Firms		
	Full Sample	S&P 500	Microcap
444	2	1	1

443	8	5	3
442	9	1	8
441	1	0	1
433	21	12	9
432	33	18	15
431	1	0	1
422	26	9	17
421	1	0	1
411	0	0	0
333	15	9	6
332	30	18	12
331	3	1	2
322	33	18	15
321	0	0	0
222	15	8	7
221	1	0	1
211	1	0	1
111	0	0	0
At least one "4"– 2007	102	46	56
At least one "4"– 2017	131***	58**	73***
***Increase from 2007 to 2017 significant at p<.01 level ** Increase from 2007 to 2017 significant at p<.05 level			

To provide a sense of how financial literacy has evolved over time, Table 2 presents the audit committee financial literacy scores from 2007. In that year, almost half (49%) of the sample firms had no accounting expertise at all. Two of the firms (1.0%) had at least three audit committee members with a literacy score of "4". Differences between S&P 500 and Microcap firms were not statistically significant in 2007. The findings seem to point to some progress over time, as the number of firms in both sample subgroups with at least one "4" was significantly greater in 2017 than in 2007, both for the sample as a whole and for each sample subgroup.

To provide a closer look at changes in audit committee financial literacy over time, the 2017 audit committee literacy score for each firm was compared to that same firm's 2007 score. The literacy scores for some firms were unchanged from one period to the other. An unambiguous increase in literacy was also observed for some companies

(a change in score from 333 to 433, for example), while an unambiguous decrease in literacy was noted for others (a change in score from 433 to 333, for example). For a few firms, the overall change in literacy was indeterminate, as changes in audit committee membership resulted in both increases and decreases in member financial literacy (a change in score from 333 to 432, for example). Table 3 presents the results of this analysis.

TABLE 3 CHANGE IN AUDIT COMMITTEE LITERACY SCORES – 2007 TO 2017				
Firms	Increase in	Decrease in	No Change in	Indeterminate Change in
	Financial Literacy of Audit Committee			
Full Sample	91 <sup>***</sup>	57	37	15
S&P 500	47 <sup>**</sup>	33	13	7
Microcap	44 <sup>***</sup>	24	24	8
***Increase from 2007 to 2017 significant at p<.01 level				
**Increase from 2007 to 2017 significant at p<.05 level				

As Table 3 indicates, the most likely change observed was for an increase in audit committee literacy scores from 2007 to 2017. These increases, however, occurred in less than half (91) of the sample firms. The second most likely outcome was for a decrease in literacy scores over that time span. For the sample as a whole, a clear increase or decrease in literacy score was observed for 148 firms (91 increase; 57 decrease). Among these 148 firms then, approximately 61% increased their literacy scores. Tested against a null hypothesis of a 50% chance of a change being an increase, this result was statistically significant at the .01 level. Similar analyses for both S&P 500 and Microcap firms also revealed a significant tendency toward improvement in literacy scores. In summary, however, Table 3 does not provide evidence of an overwhelming trend among firms to improve the financial literacy of their audit committees. Although a substantial minority of audit committees did increase their literacy scores over the decade, a substantial minority is still a minority.

### Summary and Conclusions

SEC and stock exchange regulations require directors serving on corporate audit committees to be financially literate. Coates et al. (2007) argue that to be financially

literate requires a knowledge base and skill set such that financial literacy is essentially equivalent to *accounting* literacy.

This study employed a financial literacy metric devised by Coates et al. (2007) to assess both the current level of audit committee literacy and whether that level has increased over the past decade. The analysis used a sample comprised of both the largest public firms in the United States (S&P 500) and the smallest (Russell Microcap).

The results indicate that the accounting expertise of the audit committee is not a priority for many companies. Although the majority (approximately 65%) of firms had at least one audit committee member with significant accounting experience, few audit committees had more than one such member. Interestingly, Russell Microcap firms were significantly more likely to have a member with accounting experience than were S&P 500 firms. One potential explanation for this difference may be that smaller firms lack the sophisticated internal control systems, internal audit staff, etc. that larger firms possess and are more likely to compensate for this deficiency by naming a director with accounting expertise to the audit committee.

The findings also reveal an overall increase in audit committee financial literacy as more firms have added members with an extensive accounting background over the past decade. This increase has been moderate, however, as less than half of the sample firms enhanced the literacy of their audit committees during that time.

Academic research has confirmed the benefits of directors with accounting expertise serving on audit committees. Accounting expertise on the audit committee is positively associated with more diligent audit committees, financial reporting that is both of higher quality and more timely, and lower audit fees.

It should not cost much for firms to increase the accounting knowledge of their audit committees. Coates et al, (2007, p. 187) note that “(t)he out-of-pocket cost is likely zero, but surely less than \$100,000 per year for replacing a member with a score of 3, 2, or 1 with a member who scores 4.” They also point out that there is no shortage of qualified candidates, including retired partners from Big Four firms. They conclude (p. 191):

If by financially literate we mean understanding accounting at the level of an introductory MBA accounting course, then audit committee members appear not yet literate. ... Shareholders appear to benefit from a company’s increasingly literate audit committee, and the magnitude of the return dwarfs the cost of increasing that literacy.

Given the significant benefits and negligible costs, the obvious question for future research, then, is why the accounting expertise of audit committees is not greater than it is.

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