ARTICLES:
Your Future Employer “DISliked” Your Status: Imposing Additional Background Check Procedures for Employees’ Social Media Sites
Denise S. Smith, Jason P. Kight

An Analysis of Recession-Affected Labor and Education Constructs in the Midwestern United States (2005–2011)
James Martin, David P. Price

The Importance of Expenditures for Higher Education Graduation Rates
Casey R. Abington

Relationships Between Students’ Psychological Capital, Mentoring, and Career Commitment
Linda Duke, Julie “J.P.” Palmer-Schuyler

Website Design and Environmental Imagery: An Investigation Using Oil and Gas Firms
John A. Pendley, Barbara Woods McElroy

Ahren Johnston

BOOK REVIEWS:
The Brain and Emotional Intelligence: New Insights
Reviewed by Doug S. Russell
Daniel Goleman

Too Big to Ignore: The Business Case for Big Data
Reviewed by Joni Adkins
Phil Simon

Lean In: Women, Work, and the Will to Lead
Reviewed by Cindy Kenkel
Sheryl Sandberg

Available online at www.nwmissouri.edu

Volume 33 May 2014
CONTENTS

ARTICLES:

Your Future Employer “DISliked” Your Status: Imposing Additional Background Check Procedures for Employees’ Social Media Sites ................................................................. 1
   Denise S. Smith, Jason P. Kight

   James Martin, David P. Price

The Importance of Expenditures for Higher Education Graduation Rates.............. 35
   Casey R. Abington

Relationships Between Students’ Psychological Capital, Mentoring, and Career Commitment .................................................. 45
   Linda Duke, Julie "J.P" Palmer-Schuyler

Website Design and Environmental Imagery: An Investigation Using Oil and Gas Firms .............................................................................. 62
   John A. Pendley, Barbara Woods McElroy

A Study of Trends in Wholesaler Inventory Performance: 1981–2012.................. 75
   Ahren Johnston

BOOK REVIEWS:

The Brain and Emotional Intelligence: New Insights ........................................ 94
   Daniel Goleman
   Reviewed by Doug S. Russell

Too Big to Ignore: The Business Case for Big Data ....................................... 96
   Phil Simon
   Reviewed by Joni Adkins

Lean In: Women, Work, and the Will to Lead ............................................. 98
   Sheryl Sandberg
   Reviewed by Cindy Kenkel

Available online at www.nwmissouri.edu

Volume 33    May 2014
Terry Coalter, Editor  
Mary Givens, Editorial Assistant  
Melinda Kelsey, Graphic Designer  

The editor gratefully acknowledges assistance from the following reviewers from Northwest Missouri State University:  
Casey Abington  Deborah Toomey  
Ben Blackford  James Walker  
Ben Collier  Tekle Wanorie  
Chi Lo Lim  Jason White  
Stephen Ludwig  Rahnl Wood  
Tiebing Shi  

From other institutions:  
Gary Baker, Washburn University  
Benjamin B. Boozer, Jr., Jacksonville State University  
Christopher Decker, University of Nebraska–Omaha  
Bruce Domazlicky, Southeast Missouri State University  
Linda Duke, William Woods University  
Leslie Fletcher, Georgia Southern University  
Konrad Gunderson, Missouri Western State University  
Johndavid Kerr, Harris-Stowe State University  
Nicholas S. Miceli, Park University  
Marcel Minutolo, Robert Morris University  
Cathy L. Taylor, Park University  

Manuscript Submissions  
The *Regional Business Review* welcomes original, unpublished manuscripts in the fields of management, marketing, finance, economics, accounting, management information systems, and other business-related fields. Interested authors should contact the editor for manuscript submission guidelines:  
Terry Coalter, J.D., Ph.D., Editor  
Booth College of Business and Professional Studies  
Northwest Missouri State University  
800 University Drive  
Maryville, MO 64468-6001  
coalter@nwmissouri.edu
Your Future Employer “DISliked” Your Status: Imposing Additional Background Check Procedures for Employees’ Social Media Sites

Denise S. Smith
Jason P. Kight
Eastern Illinois University

ABSTRACT
In our fast paced digital society, it is increasingly difficult for employers to ensure new hires are properly screened to ensure they are qualified, and they will not pose a risk to others with whom they will come into contact during the performance of the job. There is a temptation for employers to search applicants’ social media accounts for information that may not be otherwise available. Currently, however, eleven states have passed laws designed to protect individuals’ private social media sites from employers requiring access as a part of the selection process. More states are considering similar bills. In light of this trend, employers need to be cognizant of what is due diligence and what may constitute an invasion of privacy. The authors explore the risks of negligent hiring liability for not using social media to verify potential applicants and suggest ways to avoid some of the pitfalls for its use.

Keywords: negligent hiring, negligent retention, background checks, reference checks, social media, Facebook, password protection

INTRODUCTION
It is common practice for human resource professionals to verify work history information and conduct reference checks for job applicants. A growing number of courts, though, now recognize a duty to conduct more extensive background checks. Failure to conduct adequate screening and background checks can result in serious liability for employers if an employee causes injury to co-workers or
customers, and it is later determined that these injuries could have been avoided had the employer conducted a reasonable investigation of that employee's prior history (Levashina & Campion, 2009). Several authors have addressed the practice of using search engines, such as Google, to obtain information about applicants that would not necessarily appear on resumes or be discussed by persons serving as references. Few, though, have analyzed the practice of accessing social media sites, especially those that are password protected and whose owners have selected high levels of privacy settings, to determine whether such sites are appropriate or accurate sources for background check information.

**NEGLIGENT HIRING AND RESPONDEAT SUPERIOR**

**Negligence**

The law recognizes a number of basic elements that are required to establish negligence: a person was under a legal duty to use “reasonable care,” that person failed to act reasonably, and damages were caused by the person's failure to act reasonably. As one definition states, negligence is “a failure to behave with the level of care that someone of ordinary prudence would have exercised under the same circumstances” (negligence, n.d.). Under principles of simple negligence, an individual is responsible for the consequences of his or her own actions. As explained in further detail below, the concepts of negligence—duty, breach of duty, injury, and causation—have been expanded to apply to principal-agent and employer-employee relationships, giving rise to the causes of action for negligent hiring, negligent training, and negligent retention.

**Agency Principles**

An agency is created when one person, an agent, is given the legal authority to act for another person, the principal (agency, n.d.). The doctrine of *respondeat superior*, often called “vicarious liability,” is derived from agency law, which imposes liability on the master for the torts committed by the servant acting in the course of employment (Prosser, 1971). The principles of respondeat superior apply when a third party's injury is caused by an employee's commission of a tort while acting within the scope of employment. Under this doctrine, “an employer is vicariously liable for the negligence of an agent or employee acting within the scope of his or her agency or employment, although the principal or employer has not personally committed a wrong” (employment relationships, 2012). Among the factors that a court will consider in determining whether an action was within the scope of employment are foreseeability and whether the action is done in furtherance of the employer's interest (employment relationships, 2012).

If an employee is held to have acted negligently within the scope of employment, courts may order the employer to pay the injured party the amount of actual damages, defined by Black’s Law Dictionary as “an amount awarded … to compensate for a proven injury or loss.” However, punitive damages, an amount
over and above the total amount of actual damages, will rarely be imposed on
the employer, since these damages “are awarded primarily to punish the offender
and discourage similar offenses, and these punitive … justifications are sharply
diminished where liability is imposed vicariously” (Ballard v. Bird, 1980).
Moreover, if a third party is injured by an employee who commits an intentional
tort or criminal act, or is acting outside the scope of employment, the employer
will not be held vicariously liable (employment relationships, 2012).

Negligent Hiring
Tort law provides that individuals generally have no duty to act, but if they
choose to act, they must use reasonable care. One exception to this rule is that
there is a duty to act in order to protect people with whom the actor has a special
relationship (Lillard, 2007). Employers hire employees to carry out the tasks
involved in conducting business and have the duty to supervise and control
these employees. As Lillard (2007) stated, “There is a tort duty to hire, train,
and supervise with due care … to avoid negligent hire and supervision” (p. 728).
Rather than assessing employer liability on the actions of the employee or agent,
the theory of negligence, either in hiring, retention, or supervision, imposes
liability on an employer for breaching a duty of care owed to third parties.

Negligent Training and Supervision
The concept of employers’ duty to hire, train, and supervise is not new. As
early as 1886, the Supreme Court of the United States stated, “it is the duty of
the employer to select and retain servants who are fitted and competent for
the service … ” (Northern Pacific Railroad Co. v. Herbert, 1886). However, it
appears that negligent hiring as a cause of action against an employer for acts
committed by employee did not gain much traction in the United States until
the 1970s (e.g., Insurance Co. of North America v. Hewitt-Robbins, 1973; Prince
Association Journal referred to negligent hiring as “an emerging tort in both state
and federal law” (Silver, 1987, p. 72). In contrast to a vicarious liability, by which
an employee’s negligence is imputed to the employer, it is the employer’s own act
that gives rise to a cause of action for negligent hiring. For this reason, a court
may assess punitive damages against an employer if the facts warrant.

Negligent supervision states, such as Michigan, have included language that
groups the causes of action of hiring, retention, and supervision together
when a party fails to reasonably monitor or control the actions of an employee
(Verran v. United States, 2004, p. 771). To be successful in an action for negligent
supervision, a plaintiff must plead and prove that an employer knew or should
have known that its employee had a particular unfitness for his position so as
to create a danger of harm to third persons, and that the employer’s failure to
safeguard the plaintiff against this particular unfitness proximately caused the
plaintiff’s injury. “To satisfy the element of proximate causation, the plaintiff

Regional Business Review

3
must demonstrate a tangible connection between the employee's particular unfitness for the job and the resulting harm to the plaintiff” (Platson v. NSM, America Inc., 2001, para. 12). An Illinois court held that the "particular unfitness of the employee must have rendered the plaintiff’s injury foreseeable to a person of ordinary prudence in the employer’s position” (Platson v. NSM, America Inc., 2001, para. 12).

The difference between negligent supervision and negligent hiring was illustrated in the case of Miller v. Walmart Stores Inc. (1998). In 1998, Wisconsin Supreme Court recognized negligent supervision as a tort in Wisconsin. Miller was shopping at Walmart when several employees accosted him and accused him of shoplifting. The employees further detained, searched, and interrogated Miller for suspected theft of a swimsuit, which was not found on Miller’s person. Miller sued for negligence in the hiring, training, and supervision of Walmart’s employees, claiming they had caused him damages. In its decision in this case, The Wisconsin Supreme Court established that for a claim of negligent supervision or training to succeed, the elements that must be met are: (1) the employer owed the plaintiff a duty of care; (2) the employer breached the duty of care during training or supervision of the employee; (3) the employee’s act or omission caused the plaintiff’s injuries; and (4) the employer’s act or omission caused the employee’s act or omission. Generally, in the Midwest all three claims of negligent hiring, retention, and supervision are brought simultaneously.

NEGLIGENCE HIRING STATUTES

In the Midwest there is little variation among states in the application of negligent hiring. For instance, "Illinois law recognizes a cause of action against an employer for negligently hiring, or retaining in its employment, an employee it knew, or should have known, was unfit for the job so as to create a danger of harm to third persons” (Van Horne v. Muller, 1998, p. 311). In comparison, for a plaintiff in Wisconsin to state a claim, the law requires him or her to allege “(1) the existence of a duty of care on the part of the employer; (2) a breach of that duty of care; (3) a wrongful act of the employee that was the cause of the injury; and (4) an act or omission of the employer that was the cause of the employee’s wrongful act” (Sigler v. Kobinsky, 2008, p. 7). The difference between the two states is relatively minor. Illinois and Wisconsin both appear to have adopted the standard negligence formula of knowing or should have known, and the basic legal framework of duty, breach, causation, and injury. Indiana has adopted the Restatement (Second) of Torts § 317 (Frye v. American Painting Co., 1994, p. 998). The Restatement defines negligent hiring (in pertinent part) as, “A master is under a duty to exercise reasonable care to control his servant while acting outside the scope of his employment as to prevent him from intentionally harming others or from so conducting himself as to create an unreasonable risk of bodily harm to them, if (a) the servant (i) is upon the premises in possession of the master or upon which the servant is privileged to enter only as his servant,
or (ii) is using a chattel of the master, and (b) the master (i) knows or has reason to know that he has the ability to control his servant, and (ii) knows or should know of the necessity and opportunity for exercising such control” (Restatement of Torts, Second, 2006, Sec. 317). Indiana courts have also noted that “the master may subject himself to liability under the rule stated in this Section by retaining in his employment servants who, to his knowledge, are in the habit of misconducting themselves in a manner dangerous to others” (Konkle v. Henson, 1996, p. 454).

Michigan's negligent hiring statute states, “To sustain [a claim for negligent hiring], a plaintiff must produce evidence ‘of appropriate standard for hiring, retaining, or supervising’ the relevant class of employee, … as well as evidence demonstrating that the employer knew or should have known of the employee’s propensity to engage in the challenged conduct. … In addition, such claims are subject to the overarching principle that, under Michigan law, an employer cannot be held liable for intentional torts committed by an employee outside the scope of his employment” (Verran v. United States, 2004, p. 771). Finally, Minnesota requires that, “A claim of negligent hiring is predicated on the negligence of an employer in placing a person with known propensities, or propensities which should have been discovered by reasonable investigation in an employment position in which, because of the circumstances of the employment, it should have been foreseeable that the hired individual posed a threat of injury to others.” Liability for negligent hiring, “is determined by the totality of the circumstances surrounding the hiring and whether the employer exercised reasonable care” (L.M. v. Karlson, 2002, p. 544).

Overall, these definitions of negligent hiring are rooted in the basic notions of negligence, discussed above.

BACKGROUND AND REFERENCE CHECKS

The Society for Human Resource Management (SHRM) provides some guidance to its member professionals. A recent SHRM article notes that “[i]ncreased use of criminal background checks by employers to prescreen job applicants stems from the growth of claims alleging that an employer was negligent in hiring or retaining an employee who subsequently engaged in workplace violence or some other act that resulted in harm to a person … or property” (Bliss & Thornton, 2012).

In response to increased risk for negligent hiring, many employers conduct background checks as a matter of course and some go beyond the traditional reference checking. An article in Workforce Management, for example, recommends that employers “make a systematic effort to gain relevant information about the applicant, verify documentation, [and] follow up on missing records or gaps in employment” to demonstrate that reasonable care was used in the hiring decision (Hanson, 2006). Employers must make a reasonable
effort to obtain accurate information. This advice is sound, based on court rulings in negligent hiring cases. The 1983 Minnesota Supreme Court case of *Ponticas v. K.M.S. Investments* concerned a convicted felon who was hired as a resident manager of an apartment complex, given passkeys, and used the keys to access an apartment to rape a resident. Although this information would have been easily discovered if the apartment owner had conducted a background check, she did not do so. In its opinion, the court explained the concept of “reasonable investigation” in the following way, “The scope of the investigation is directly related to the severity of risk third parties are subjected to by an incompetent employee.” In other words, “the more obvious the potential for harm the more clearly dangerous the situation is, and the more obvious the duty” (p. 912) for performing background checks beyond the traditional telephone reference verifications.

**APPLYING A NEGLIGENT HIRING FRAMEWORK TO SOCIAL MEDIA**

“Googling” and making use of similar internet search engines to obtain more information about a candidate has become a fairly common practice during the candidate screening process. One survey of 300 human resource professionals revealed that nearly half of all people surveyed had made use of information posted on the internet by job applicants (Bliss & Thornton, 2012). A growing number of courts recognize a duty to conduct background checks. Because a Google search is easier and quicker than conducting some other types of background checks, it is likely that a court might determine that an employer “should have known” about an applicant’s violent or larcenous tendencies if these would have shown up in the results of an internet search (Peebles, 2012). “Liability is predicated on the negligence of an employer in placing a person with known propensities, or propensities which *should have been discovered* by reasonable investigation, in an employment position in which, because of the circumstances of the employment, it should have been foreseeable that the hired individual posed a threat of injury to others” (Peebles, 2012, p. 1406, emphasis added).

While internet search results use publicly available postings, an applicant’s personal social media account, such as Facebook, has privacy settings. The type of information revealed on an applicant’s site is frequently only visible to those to whom the account owner grants access. Some employers may ask for an applicant’s password or ask the applicant to login to his or her account during an interview to gain access, or have a younger employee send a “friend request” to the applicant to gain access to postings. In light of this trend, several states have enacted statutes prohibiting this practice, and others are considering similar bills.
STATE PASSWORD PROTECTION STATUTES

As of the beginning of 2014, eleven states have passed some form of statute prohibiting employers from requiring or requesting social media passwords from employees or job applicants. The list includes Arkansas, California, Colorado, Illinois, Maryland, Michigan, Nevada, New Mexico, Utah, Washington, and, most recently, Oregon (Gordon & Hwang, 2013). In addition to these states, the National Conference of State Legislatures includes 19 more states in its list of “2014 Legislation” in the area of “Employer Access to Social Media Usernames and Passwords,” which includes carryover bills from 2013 sessions.

One example of a recently passed law is the Illinois “Right to Privacy in the Workplace Act” 820 ILCS 55 (2012). This act makes it unlawful for an employer to “request or require any employee or prospective employee to provide any password or other related account information in order to gain access to the employee’s or prospective employee’s account or profile on a social networking website or to demand access in any manner to an employee’s or prospective employee’s account or profile on a social networking website” (Section 1). This act protects job applicants from handing over social networking passwords to potential employers. One of the obvious downsides for applicants is that if they are not forthcoming in the interview, they may not be hired. Another potential flaw with the “Right to Privacy in the Workplace Act” is that the penalties could be deemed insufficient for the conduct. If an applicant feels that a potential employer has violated the Act, the recourse is to file a complaint with the Illinois Department of Labor (Section 15). Following the complaint an investigation will be initiated, and if the Department of Labor finds a violation has occurred, the Department may commence an action in the circuit court. In these cases, the employee may only recover actual damages plus costs. If the court finds the violation to be willful and knowing, the applicant can recover $200 plus costs, reasonable attorney’s fees, and actual damages (Section 15).

Most of the bills listed on the National Conference of State Legislatures site include language similar to Illinois’ statute, but include language prohibiting employers from discharging, disciplining, failing to hire, or “otherwise penalizing an employee or applicant … for failure to grant access to … applicant’s personal internet account” (H.F. 127 Iowa, 2013). This additional provision gives more protection than the Illinois statute for applicants and employees who refuse to disclose usernames and passwords.

The same Iowa bill, though, contains the following unique language in Section 3.1.: “This chapter does not prohibit or restrict an employer from complying with a duty to screen employees or applicants for employment prior to hiring or to monitor or retain employee communications pursuant to state or federal law.” This phrasing implies that an employer may be permitted to access an applicant’s or employee’s social media accounts for the purpose of background checks or to investigate a claim.
PROPOSED FEDERAL LEGISLATION

Several password protection bills have been introduced in the U.S. Senate and House of Representatives. The Password Protection Act of 2013 was introduced in the House of Representatives in May, 2013, as H.R. 2077 and a related bill was introduced in the U.S. Senate in August, 2013, as S. 1426. Both bills propose to amend the federal criminal code to impose a fine on any employer who “knowingly and intentionally … compels or coerces any person to provide … a password or similar information to access a protected computer not owned by such employer” or who penalizes a person who fails to authorize access to such computer (H.R. 2077, 2013 and S. 1426, 113th Cong., 2013).

In addition to these proposed laws, a “Social Networking Online Protection Act” was introduced in the U.S. House of Representatives on February 6, 2013, as H.R. 537. The language of this bill aligns more closely with the state statutes previously discussed. The proposed law would make it unlawful for an employer “to require or request that an employee or applicant for employment provide the employer with a user name, password, or any other means for accessing … a personal account” or “to discharge, discipline, or discriminate” against a person for refusal to do so (H.R. 537, 2013, 113th Cong. 2013). Though none of these bills has been returned from committee, the fact that they have been drafted and sponsored may indicate that this is an emerging issue for many Americans.

RISKS AND BENEFITS OF USING INFORMATION FROM SOCIAL MEDIA SITES

EEOC Issues

Additional issues with accessing an applicant’s social media site involve the potential for gaining information about an applicant’s protected status that would otherwise be unavailable pre-interview, or that it might reveal answers to questions that should not be asked, such as marital status or religious preference. An applicant’s profile picture could reveal gender, age, race, or ethnicity. A recent regulation under the Genetic Information Nondiscrimination Act of 2008 (GINA) “restricts employers … from requesting, requiring, or purchasing genetic information” (29 C.F.R. 1635, 2010) and prohibits employers from “engaging in acts that present a heightened risk of acquiring genetic information, even without a specific intention to do so, such as … when they access sources of information (e.g., certain types of databases, websites, or social networking sites) that are likely to contain genetic information about individuals” (29 C.F.R. 1635.1, 2010).

As of this writing, there are no current and no proposed E.E.O.C. regulations concerning the use of social networking sites in the job application or evaluation process; however, the National Labor Relations Board has issued several opinions on workplace policies and issued a “Social Media Policy Report” in 2012.
National Labor Relations Board Issues

The National Labor Relations Board (NLRB) has conducted numerous investigations of alleged violations of law when employers have disciplined employees for posting unflattering comments about the employer on Facebook. For the most part, the NLRB has found in favor of the employees if the comments can be regarded as “concerted activity.” For example, a non-profit organization discharged five employees for criticizing working conditions on their Facebook pages, including comments about workload and staffing issues. The National Labor Relations Board determined that this Facebook discussion constituted concerted activity under Section 7 of the National Labor Relations Act. This result came as a surprise to many employers, since the workers were not members of any union (Hispanics United of Buffalo, 2012).

The NLRB also ruled wholesale club Costco’s policy warning employees that “statements posted electronically … that damage the company, defame any individual or damage any person’s reputation or violate the policies outlined in the Costco Employee Agreement” may result in discipline or dismissal of the employee as infringing on employees’ Section 7 rights (Costco Wholesale Corp. and United Food and Commercial Workers Union, Local 371).

In the case of a Facebook investigation of a potential negligent retention risk, an employer would need to proceed cautiously. The employer must clearly understand which postings might indicate a characteristic or practice that might expose the employer to liability for negligent retention and which postings might involve the employee’s comments on terms and conditions of employment, which are protected under the National Labor Relations Act (NLRA).

On May 20, 2012, the National Labor Relations Board published a 24 page report of the General Counsel addressing “Social Media Policy” (Office of the General Counsel, 2012), outlining six cases in which the NLRB found that social media policies violated Section 7 of the NLRB, and giving employers some guidance for social media policies. Policies may include language about confidentiality of employer’s trade secrets and may prohibit employees from posting information in the employer’s name without permission.

A recent National Labor Relations Board decision was challenged in federal court and its order vacated due to the court’s ruling that three out of five Board members had not been properly appointed, resulting in a lack of quorum for the decision, which was rendered on February 8, 2012 (Noel Canning v. N.L.R.B., 2013). This ruling leaves open the question of whether other rulings by this Board might also be ruled invalid.

PROPOSED POLICY

Employers should proceed with caution in deciding whether to use Facebook or other social media to conduct background screenings of candidates or to
use in assessing risk for negligent retention. In light of current trends in state and federal regulations, employers should not ask for usernames or passwords for applicants’ or employees’ social media accounts, nor should they ask for another employee to “friend” an applicant to gain access to password protected information. Accessing information that is publicly available through a search engine such as Google is acceptable, since the account holder should have no reasonable expectation of privacy for information that is not protected by higher privacy settings.

In the quest to gain more information, an employer may be gaining access to sensitive information that would otherwise be unavailable and would potentially be inappropriate or even illegal to consider in a hiring or retention decision. The recent GINA regulation, for example, could be violated if an individual’s Facebook page indicated an interest or membership in a group which advocates for victims of genetic disorders. Information about applicants’ marital status or family situation, religious affiliations, or sexual preference could be acquired by delving into the account holders’ “likes” or “friends.” If an employer, nevertheless, decides to use Facebook or other social media sites in its selection process, this review should be conducted after a face-to-face meeting to reduce the risk that the applicants’ race, gender, age, or disability would not be a factor in the decision to interview.
REFERENCES


Costco Wholesale Corp. and United Food and Commercial Workers Union, Local 371, 358 NLRB No. 106 (2012).


H.R. 537 113th Cong. 2013, Social Networking Online Protection Act.


Northern Pacific Railroad Co. v. Herbert, 116 U.S. 642 (1886).


Van Horne v. Muller, 185 Ill. 2nd 299 (1998).

ABSTRACT
The “Great Recession” that began in 2007 proved to be the worst economic downturn since the Great Depression. The continued slow economic recovery and subsequent long-term unemployment created changes in the general workforce and in the make-up of various workforce segments. This paper analyzes labor force and education data in an attempt to quantify the effects of the recession in terms of changes in levels of human capital creation through educational attainment. Additionally, this analysis seeks to investigate whether there has been 1) a shift from manufacturing to services industry occupations during the period of study, 2) changes in public to private sector employment, and 3) growth or shrinkage in public and/or private sector occupation classifications. Data gathered from the Bureau of Labor Statistics for the Midwestern Region of the United States and for the United States as a whole is used to investigate these issues in the time period from 2005–2011. The analyses show an increase in educational attainment related to high school completion, a decrease in public sector employment, and a shift from manufacturing jobs toward jobs in service-related industries, especially in healthcare.

Key Words: recession, Midwestern region, education, unemployment, jobs

Acknowledgements: The authors extend their gratitude to Dr. Kanalis Ockree and student research assistants Breanna Short and Krystle McDonald for their contributions to this paper.
INTRODUCTION

When staring up from the depths of a recession, those affected likely are not saying, “In the long run, we will be better off because of this.” The economic fallout of job losses and business failures leaves many failing to see any silver lining. The most recent U.S. recession lasted from December 2007 through July 2009 (Thompson, Smeeding, Levanon, & Burak, 2011), although there were recessionary indications before the recession was fully recognized, and recession effects still linger today. This paper seeks to analyze Midwestern regional and national trends in labor force distribution and educational attainment pre-, during, and post-recession. Specifically, this paper seeks to determine if certain U.S. Midwestern states experienced an increase in human capital through the labor force seeking to advance educational attainment during the recession. The authors also examine changes in the make-up of industries and occupations in Midwestern states during this period. The period of analysis begins in the years just prior to the 2005–2007 recession and ends with the most current annual data available at this paper’s completion, 2011.

Interwoven into the fabric of the recent recession is the ongoing transition in the United States from a manufacturing-based to a service-based economy (Bureau of Labor Statistics, 2010). By focusing on multiple job categories over multiple periods in multiple states, this paper presents evidence of shifts in the make-up of the workforce and the trends in occupations, such as employment in the public and private sectors. Specifically, this paper seeks to address the following four constructs:

1) Did the attainment of a higher level of education by individuals accelerate, as measured by changes in population with less than a high school education, during the recession at the national, regional, and state level? That is, do statistics indicate that job seekers saw an increased education level as more beneficial in their search for employment during the recession?

2) Did the transition from a manufacturing-based economy to a service-based economy accelerate in the U.S., in the Midwest, and for specific Midwestern states during the recession?

3) Did the mix of private sector versus public sector jobs shift during the recession? The analysis examines increases and decreases in public and private employment at the national, regional, and state levels.

4) As demographics shift and technologies evolve, certain jobs become obsolete while others are in high demand. This paper presents an economic “litmus test” related to the impact of the recession on education and labor. This involves identifying the nation’s fastest growing job sectors and most rapidly declining job sectors. The authors then analyze data at the state, regional, and national level and compare these results to the previous education and labor analysis.
METHODOLOGY

This paper takes a critical look at the interplay of education with job growth and decline in public and private sectors as well as job growth and decline in manufacturing and service industries, prior to, during, and after a recession. The primary tool of analysis is the calculation of percentage change in the levels of employment in each of these sectors, by state, region, and at the national level. The authors acknowledge that job percentage changes in populous states (e.g., Illinois) will have a considerably larger nominal effect in terms of job growth and decline than equal percentage changes in less populous states (e.g., North Dakota), given the larger base from which they are calculated. Comparable base amounts of populations by state in 2011 are attached as Appendix 1 to this paper. Additionally, the nominal calculated increases and decreases in job categories (used as part of Tables 1–9) are included in Appendix 2 and referenced herein.

CHANGES IN EDUCATIONAL ATTAINMENT

Research suggests that increases in education align with increased employment opportunities (Bureau of Labor Statistics, 2012). Abel and Gabe (2008) suggest that increases in human capital and economic growth arise via educational attainment. While many employment positions require a minimum of a high school diploma or passage of the General Education Development (GED) exam to be considered for hiring, others require either additional technical education or training, or college degrees (generally either form of additional education level requires a high school diploma or GED as a prerequisite). Employees or prospective employees, therefore, can generally be expected to seek increased education (beginning with the high school diploma) when attempting to find new employment or achieve advancement and promotion from an existing job. The authors hypothesize that during a recession, the level of educational attainment will increase when compared to non-recessionary periods. This hypothesis is based on two premises. First, in periods of job loss and decreasing employment such as a recession, individuals seek to improve their level of educational attainment to be academically or technically eligible to qualify for a broader spectrum of job openings in a more competitive job market. Second, in periods of job loss and decreasing employment, such as a recession, individuals will have more time available for education. This condition arises because more individuals tend to either work fewer hours or be unemployed as a result of recessionary pressures on the economy as a whole.

The data analyzed in this first step pertains to the percentage of the U.S. population with less than a high school diploma. Data from the U.S. Census Bureau Database (2011) extracted for the periods 2005–2011, included data for the entire United States. We also extracted and evaluated a subset of educational attainment data for the 12-state Midwestern region (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin). Graph 1 summarizes these findings on a percentage of population basis.
As expected, the level of educational attainment improved at both the national and regional levels beginning in 2007, the onset of the recession. This is demonstrated by a decrease in the percentage of the population with less than a high school diploma on the heels of a national and regional decrease in educational attainment reflected in 2006, a year the U.S. economy was expanding. There also exists a clear consistent advantage in the Midwest over the nation as a whole in educational attainment. This superior educational level ranged between a 2.69% to 2.93% advantage over national educational attainment within the study period. Similarly, as indicated in Graph 2, changes in the national and Midwestern region actual population with less than a high school diploma also changed in a similar fashion.
Across the 12 states that make up the Midwestern region, two metrics were calculated as presented in Table 1. First, states were ranked according to the greatest increase in educational attainment as measured by the decrease in the percentage of the population with less than a high school diploma (2005–2011). Second, the nominal ranking of each state in 2011 was calculated and disclosed in that table. This ranking indicates which midwestern state has the highest or lowest percentage of population with a completed high school diploma in 2011. A ranking of “1” would indicate a state with highest educational attainment in the region while a ranking of “12” would indicate the lowest educational attainment.

### Table 1
**Educational Attainment**
**Percentage Change in State Population with Less than High School Diploma**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dakota</td>
<td>−21.19%</td>
<td>3</td>
</tr>
<tr>
<td>South Dakota</td>
<td>−17.54%</td>
<td>4</td>
</tr>
<tr>
<td>Missouri</td>
<td>−17.33%</td>
<td>10</td>
</tr>
<tr>
<td>Ohio</td>
<td>−14.60%</td>
<td>9</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>−14.29%</td>
<td>6</td>
</tr>
<tr>
<td>Nebraska</td>
<td>−14.29%</td>
<td>2</td>
</tr>
<tr>
<td>Michigan</td>
<td>−13.85%</td>
<td>8</td>
</tr>
<tr>
<td>Indiana</td>
<td>−13.61%</td>
<td>11</td>
</tr>
<tr>
<td>Minnesota</td>
<td>−12.09%</td>
<td>1</td>
</tr>
<tr>
<td>Kansas</td>
<td>−11.50%</td>
<td>7</td>
</tr>
<tr>
<td>Illinois</td>
<td>−10.49%</td>
<td>12</td>
</tr>
<tr>
<td>Iowa</td>
<td>−9.62%</td>
<td>5</td>
</tr>
</tbody>
</table>

Dramatic decreases in the populations without high school diplomas in North and South Dakota were not totally unexpected as these states experienced economic expansion during the recessionary period studied due in part to oil and gas exploration activities. Both states experienced an influx of population to which could be attributed the increase in total population educational attainment. When comparing these two states’ 2011 ranking within the region to their 2005 ranking, South Dakota went from 6th to 4th while North Dakota vaulted from 7th to 3rd. No other state experienced as great of an increase during the period as North Dakota.
U.S. TRANSITION FROM MANUFACTURING TO A SERVICE-BASED ECONOMY

Recent research shows that the U.S. economy transitioning from a manufacturing-based economy to one based primarily on providing services (Buera & Kaboski, 2012). Contrary to this trend, recent evidence suggests factors such as favorable exchange rates and increased labor costs overseas, particularly in China, benefit U.S. manufacturing sectors, and thus created a post-recession increase in domestic manufacturing (Boston Consulting Group, 2011). In any case, data related to national, regional, and state trends in growth or decline in manufacturing and service sectors provides fertile ground for analysis.

This analysis extracted the number of employees in manufacturing-based occupations for Midwestern states and for the nation for 2005–2011. Those working in construction, manufacturing, and wholesale trade as reported in the U.S. Census database, we identified as manufacturing-based employees. Similarly, we obtained the number of employees in service-based occupations for Midwestern states and the nation for 2005–2011. Individuals working in 1) professional, scientific, management, administrative, and waste management services; 2) educational services, health care, and social assistance; and 3) arts, entertainment, recreation, accommodation, and food services as reported in the U.S. Census database, we considered service-based employees. Using this data, annual percentage changes in the national and regional manufacturing and service workforce were calculated. Graph 3 and Graph 4 show these results.
In examining Graph 3, no notable difference exists between the Midwestern region and the nation when examining the recessionary decreases in manufacturing employment and the 2011 recovery increases in manufacturing employment. Graph 4 results diverge more between the nation and region. Clearly the Midwest’s service sector resisted job loss more than the nation as a whole, with 2009 being the only year in the period showing a loss of service sector jobs. The nation experienced service sector job losses in 2007, 2009, and 2010. Additionally, by the end of 2011, both the nation and region experienced roughly the same percentage of job change in both the manufacturing and service sector. Considering only the job categories outlined above, on a national basis, service employment increased to 70.2% of the working population in 2011, as compared to 64.7% in 2005, an increase of 5.5%. Regionally, service employment increased to 65.6% of the working population by 2011, up from 60.3% in 2005, an increase of 5.3% over the same period.

Table 2 and Table 3 provide additional views of the effects on manufacturing and service employment for states in the Midwest. Two constructs were calculated for each state and presented in each table: 1) states are ranked according to which state showed a) the greatest decrease in percentage of the workforce in manufacturing jobs (Table 2), and b) the greatest increase in percentage of the workforce in service jobs (Table 3) from 2005 to 2011; 2) the nominal ranking of each state in these job classifications in 2011 is shown in Tables 2 and 3. In Table 2, this ranking indicates the Midwestern states with the highest to lowest percentage of population working in manufacturing related occupations in 2011 with “1” being the highest and a ranking of “12” being lowest. In Table 3, the ranking indicates the Midwestern states with the highest to lowest percentage of population working in service industry occupations in 2011, with “1” being the highest and a ranking of “12” being lowest.
### Table 2
Manufacturing Employment
Change in Percentage of State Population Working in Manufacturing, Construction & Wholesale Trades

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>−17.05%</td>
<td>3</td>
</tr>
<tr>
<td>Missouri</td>
<td>−14.81%</td>
<td>9</td>
</tr>
<tr>
<td>Indiana</td>
<td>−13.92%</td>
<td>2</td>
</tr>
<tr>
<td>Ohio</td>
<td>−12.97%</td>
<td>4</td>
</tr>
<tr>
<td>Illinois</td>
<td>−12.73%</td>
<td>8</td>
</tr>
<tr>
<td>Minnesota</td>
<td>−12.63%</td>
<td>6</td>
</tr>
<tr>
<td>Kansas</td>
<td>−12.32%</td>
<td>7</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>−10.85%</td>
<td>1</td>
</tr>
<tr>
<td>Iowa</td>
<td>−10.82%</td>
<td>5</td>
</tr>
<tr>
<td>Nebraska</td>
<td>−9.22%</td>
<td>10</td>
</tr>
<tr>
<td>North Dakota</td>
<td>−9.03%</td>
<td>12</td>
</tr>
<tr>
<td>South Dakota</td>
<td>−6.45%</td>
<td>11</td>
</tr>
</tbody>
</table>

### Table 3
Service Employment
Change in Percentage of State Population Working in Professional, Management, Education, Health, Recreation, Food Service etc.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Missouri</td>
<td>14.74%</td>
<td>4</td>
</tr>
<tr>
<td>Indiana</td>
<td>13.88%</td>
<td>7</td>
</tr>
<tr>
<td>Michigan</td>
<td>13.19%</td>
<td>1</td>
</tr>
<tr>
<td>Ohio</td>
<td>11.70%</td>
<td>5</td>
</tr>
<tr>
<td>Iowa</td>
<td>11.56%</td>
<td>11</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>11.30%</td>
<td>10</td>
</tr>
<tr>
<td>Illinois</td>
<td>10.84%</td>
<td>2</td>
</tr>
<tr>
<td>Minnesota</td>
<td>10.71%</td>
<td>3</td>
</tr>
<tr>
<td>Kansas</td>
<td>10.31%</td>
<td>6</td>
</tr>
<tr>
<td>South Dakota</td>
<td>8.93%</td>
<td>8</td>
</tr>
<tr>
<td>Nebraska</td>
<td>7.13%</td>
<td>9</td>
</tr>
<tr>
<td>North Dakota</td>
<td>2.92%</td>
<td>12</td>
</tr>
</tbody>
</table>
Conclusions drawn from Tables 2 and 3 are more nuanced. Table 2 shows that states in the eastern part of the Midwestern region (Michigan, Missouri, Indiana, and Ohio) suffered the greatest decrease in percentage of employees in manufacturing jobs, while the western states in the region (South Dakota, Nebraska, and North Dakota) showed the smallest drop in this percentage. As noted previously, Kansas may have been less affected if it had avoided the manufacturing contraction in the Wichita-based air industry (Pett & Wolff, 2011). Table 3 shows an opposite service sector effect. Eastern most Midwestern states (Michigan, Missouri, Indiana, and Ohio) showed the greatest increases in percentage of the workforce in service employment, while western most Midwestern states (South Dakota, Nebraska, North Dakota, and Kansas) showed the smallest increase in service sector employment as a percentage of population.

PRIVATE VERSUS PUBLIC EMPLOYMENT

Just as shifts occur between in manufacturing and service employment sectors before, during, and after recessions, so too shifts arise between private sector employment and public sector (government) employment. We identified the number of employees in private and public sector occupations for the Midwestern states and the nation for 2005–2011. The number of individuals identified as private sector employees worked either 1) in private wage and salary positions or 2) as self-employed workers in non-incorporated businesses (U.S. Census private sector employees). Similarly, we extracted data regarding the number of employees in public sector occupations for the Midwestern states and the U.S. for 2005–2011. The workers listed as government employees in the U.S. Census database were considered public employees. Using this data, we calculated annual percentage changes in the national and regional private and public workforce. Graph 5 and Graph 6 show these outcomes.
From examining Graph 5, small but notable differences exist between the Midwestern region and the nation related to recessionary decreases in private sector employment and the 2011 post-recession increases in private sector employment. Graph 6, involving government employment, shows more deviation between the nation and region. The Midwest’s public sector employment increased and decreased noticeably with less volatility than the national changes. Additional observation shows that by the end of 2011, both the nation and region experienced similar trends in job loss and creation in the both the private and public sectors. Considering only the job categories outlined above, on a nationwide basis, public sector employment increased 5.71% from 2005 to 2011. On a regional basis the 2005–2011 public sector jobs grew 2.10%. Private sector employment experienced a 2.53% increase nationally while the Midwestern region experienced a 0.83% decline for the same period.

Table 4 and Table 5 provide additional views of the recessionary impact on private and public sector employment for states in the region. Two metrics were calculated for each state and presented in Table 4 and Table 5. First, the states were ranked according to greatest increase or smallest decline in the percentage of employment in the private sector (Table 4). Table 5 ranks states according to the greatest increase or smallest decrease in the percentage of employment in the public sector in 2005–2011. Second, the nominal rankings of each state in 2011 are calculated and presented in Table 4 and Table 5. Table 4, indicates which Midwestern states rank highest in percentage of population employed in private sector occupations in 2011, with a ranking of “1” indicating the highest percentage of population in the private sector while a ranking of “12” indicates the lowest percentage working in the private sector. Table 5 ranks Midwestern states by which employs the highest to the lowest percentage of population in public sector occupations in 2011, with a ranking of “1” indicating the highest
percentage of population in the public sector while a ranking of “12” indicates the lowest percentage working in the public sector.

**Table 4**  
**Private Sector Employment**  
**Change in Percentage of State Population Working as a Private Wage Earner or Self-Employed**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dakota</td>
<td>1.45%</td>
<td>11</td>
</tr>
<tr>
<td>Iowa</td>
<td>0.68%</td>
<td>8</td>
</tr>
<tr>
<td>Kansas</td>
<td>0.06%</td>
<td>10</td>
</tr>
<tr>
<td>Ohio</td>
<td>−0.01%</td>
<td>6</td>
</tr>
<tr>
<td>Michigan</td>
<td>−0.04%</td>
<td>2</td>
</tr>
<tr>
<td>South Dakota</td>
<td>−0.04%</td>
<td>12</td>
</tr>
<tr>
<td>Minnesota</td>
<td>−0.09%</td>
<td>3</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>−0.14%</td>
<td>4</td>
</tr>
<tr>
<td>Illinois</td>
<td>−0.27%</td>
<td>5</td>
</tr>
<tr>
<td>Indiana</td>
<td>−0.29%</td>
<td>1</td>
</tr>
<tr>
<td>Nebraska</td>
<td>−0.52%</td>
<td>9</td>
</tr>
<tr>
<td>Missouri</td>
<td>−0.61%</td>
<td>7</td>
</tr>
</tbody>
</table>

**Table 5**  
**Public Sector Employment**  
**Change in Percentage of State Population Working for the Government**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>South Dakota</td>
<td>12.58%</td>
<td>1</td>
</tr>
<tr>
<td>Nebraska</td>
<td>9.58%</td>
<td>4</td>
</tr>
<tr>
<td>North Dakota</td>
<td>5.77%</td>
<td>2</td>
</tr>
<tr>
<td>Missouri</td>
<td>5.27%</td>
<td>6</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>4.83%</td>
<td>9</td>
</tr>
<tr>
<td>Minnesota</td>
<td>4.16%</td>
<td>10</td>
</tr>
<tr>
<td>Indiana</td>
<td>4.09%</td>
<td>12</td>
</tr>
<tr>
<td>Kansas</td>
<td>3.70%</td>
<td>3</td>
</tr>
<tr>
<td>Illinois</td>
<td>2.72%</td>
<td>8</td>
</tr>
<tr>
<td>Iowa</td>
<td>0.64%</td>
<td>5</td>
</tr>
<tr>
<td>Ohio</td>
<td>−0.54%</td>
<td>7</td>
</tr>
<tr>
<td>Michigan</td>
<td>−5.28%</td>
<td>11</td>
</tr>
</tbody>
</table>
From 2005 to 2011, only three states (North Dakota, Iowa, and Kansas) showed increases in the percentage of private sector employment. Given that these states have a lower population when compared to others analyzed, the impact on the region was negligible. Overall the region declined (~0.83%) in the percent of employment in the private sector during the period. Excluding Michigan and Ohio, all states in the region increased their percentage of public sector employment. Overall public sector employment in the region increased 2.10%. Recent oil and gas exploration in North and South Dakota has led to population growth in these states, and likely caused a higher demand for an increase in public services such as police, fire, and education (Leigh & Blakely, 2013).

Nominal rankings in 2011 of Midwestern region states clearly show the western four states (North Dakota, South Dakota, Nebraska, and Kansas) as the states experiencing the highest percentage of public employment in the workforce and also as the lowest ranked states for percentage of private sector employment. Indiana, Michigan, Minnesota, and Wisconsin occupied the other end of the public/private employment spectrum as the four highest ranking states for employment in the private sector and as the four lowest ranking states for the employment in the public sector. Factors such as the density of population are believed to have played a role in these rankings. The four remaining states (Missouri, Ohio, Iowa, and Illinois) rank at the midpoint of states for both public and private sector employment.

One additional observation is made regarding private sector employment in the region. Five states (Indiana, Minnesota, Nebraska, South Dakota, and Wisconsin) experienced a decrease in the percentage of the workforce in the private sector (Table 4) yet experienced an overall increase in private sector employment (Appendix 2). In these states, a smaller percentage of private sector jobs combined with a growing population resulted in a net increase in private sector jobs.

**DISAPPEARING JOBS**

The general premise is that levels of employment decrease during recessionary periods (Elsby, Hobijn, & Sahin, 2011; Farber, 2010). Given the depth of the 2007–2009 recession, the previous noted job declines were not unexpected. In recessionary periods, some job losses are temporary and tend to be cyclical in nature, and there is an expectation that once the recession ends, jobs will return and people will be able to “get back to work.” However, research suggests that employment participation rates fall during these periods and lasting effects result for the long-term unemployed (Hotchkiss, 2013). Cyclical job losses would likely occur in areas such as construction, manufacturing, or related support industries. Losses could also be experienced in areas such as the restaurant sector, with loss of patronage arising from a decline in discretionary income. Other job losses are noncyclical. For example, in the case of a particular state or region, these noncyclical losses include losses from closed factories that do not reopen or
losses related to work that has been permanently moved to another state, region, or country.

Additional job losses (regardless of the state of the economy) could be related to the natural evolution of the workplace. Changes in demographics such as an aging population may cause an increase in jobs related to elder care while causing a decrease in jobs related to areas such as maternity care. Other factors such as technological change may increase individual productivity thereby eliminating some jobs altogether. Changes in technology also virtually guarantee that certain jobs will diminish and eventually disappear (VCR repair) while other jobs will exhibit growth potential (IT cloud-based employment). Finally, as mentioned previously, job losses (and job growth opportunities) arise as the U.S. transitions from a manufacturing base to a service-based economy.

National BLS employment data on the fastest growing and declining occupations inspired a straightforward analysis of estimated U.S. job losses related to these phenomena (BLS, 2012b; BLS, 2012c). The authors identified the 15 U.S. occupations with the greatest percentage decrease during the 2005–2011 time period. Excluded from the analysis were jobs with fewer than 100,000 employees. These smaller job categories could show a large percentage increase or decrease, but given the small number of employees in the category, have little impact on the state or national economies.

Review of the 15 most declining occupations showed seven of the occupations directly tied to the construction industry. This decline more than likely related to the dramatic downturn in construction during the recession (Keegan, Sorenson, Morgan, Daniels, & Hayes, 2011), while the remaining eight declining jobs could have indirectly been affected by the recessionary slowdown in construction industry. However, other causes may also have an effect on those occupational declines. The list of these 15 occupations, the total percentage change from 2005 to 2011, and the identification of construction related jobs is reported in Table 6.

Table 6 data indicate, notably, that other than construction related occupations, the declining positions include jobs that appear to be causalities of technological advances (e.g., computer operators, word processors, postal service mail sorters, and executive secretaries). The decline in sewing machine operators likely reflects a shift of manufacturing work to countries with lower labor costs and increases in technology.

Table 7 offers separate data analysis for construction/non-construction occupation categories for the U.S., the Midwestern region, and for individual states within the region. Table 7 presents the percentage job loss for the all 15 declining occupations from 2005–2011, and the job loss percentage for 2005–2011, separated for construction and non-construction jobs. Ranking in this analysis presents states with smallest to greatest loss percentage for all 15 occupations.
Table 6
Top 15 National Shrinking Jobs
Construction and Non-Construction Related
Top 15 National Shrinking Jobs

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Helpers-carpenters</td>
<td>−65.58%</td>
<td>Yes</td>
</tr>
<tr>
<td>Brick masons and block masons</td>
<td>−51.65%</td>
<td>Yes</td>
</tr>
<tr>
<td>Drywall and ceiling tile installers</td>
<td>−46.09%</td>
<td>Yes</td>
</tr>
<tr>
<td>Executive secretaries and administrative assistants</td>
<td>−46.01%</td>
<td>No</td>
</tr>
<tr>
<td>Healthcare support workers, all other</td>
<td>−44.02%</td>
<td>No</td>
</tr>
<tr>
<td>Carpenters</td>
<td>−42.41%</td>
<td>Yes</td>
</tr>
<tr>
<td>Computer operators</td>
<td>−42.17%</td>
<td>No</td>
</tr>
<tr>
<td>Helpers-electricians</td>
<td>−40.72%</td>
<td>Yes</td>
</tr>
<tr>
<td>Cabinetmakers and bench carpenters</td>
<td>−38.85%</td>
<td>Yes</td>
</tr>
<tr>
<td>Cement masons and concrete finishers</td>
<td>−38.03%</td>
<td>Yes</td>
</tr>
<tr>
<td>Word processors and typists</td>
<td>−37.11%</td>
<td>No</td>
</tr>
<tr>
<td>Telemarketers</td>
<td>−36.34%</td>
<td>No</td>
</tr>
<tr>
<td>Sewing machine operators</td>
<td>−35.01%</td>
<td>No</td>
</tr>
<tr>
<td>Postal service mail sorters, processors, and processing machine operators</td>
<td>−33.91%</td>
<td>No</td>
</tr>
<tr>
<td>Slaughterers and meat packers</td>
<td>−33.08%</td>
<td>No</td>
</tr>
</tbody>
</table>

As expected, North and South Dakota experienced the lowest percentage job losses with 12.56% and 12.59% respectively. The oil and gas related economic boom experienced in the Dakotas clearly buffered the Dakota’s job loss incidence, as previously mentioned. Further support for this premise arises in area of the percentage decrease in the Top 15 construction related jobs. Here, South Dakota only suffered a 7.55% decline while North Dakota was the only Midwestern state to show an increase in construction related jobs.

The non-construction job loss column depicts another interesting finding. For jobs listed in Table 6, there is a wide range of percentage job losses. These declines could be due in part to factors such as technological changes, demographic changes, and the movement away from a manufacturing-based economy. Minnesota reports the lowest percentage losses in this category at −19.27% and Wisconsin the highest at −51.26%. Future research should address the unanswered question of whether this type of shift, in the long run, benefits or harms the economy of a state experiencing the shift related losses. Part of that answer will depend on whether a state’s workers obtain education and training concomitant with new job opportunities. Another part of the answer resides
in whether the state actually develops employment opportunities for displaced workers in other, perhaps growing, industries. States and regions therefore must be willing to retrain and up-skill their workforce as do private firms. And, workers must be willing to take advantage of these education/training related opportunities.

### Table 7

*Top 15 National Shrinking Jobs Construction and Non-Construction Related by State*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>South Dakota</td>
<td>−12.56%</td>
<td>−20.24%</td>
<td>−7.55%</td>
</tr>
<tr>
<td>North Dakota</td>
<td>−12.59%</td>
<td>−26.42%</td>
<td>5.24%</td>
</tr>
<tr>
<td>Minnesota</td>
<td>−29.73%</td>
<td>−19.27%</td>
<td>−45.30%</td>
</tr>
<tr>
<td>Nebraska</td>
<td>−33.29%</td>
<td>−37.76%</td>
<td>−25.56%</td>
</tr>
<tr>
<td>Illinois</td>
<td>−38.11%</td>
<td>−34.45%</td>
<td>−44.52%</td>
</tr>
<tr>
<td>Ohio</td>
<td>−38.24%</td>
<td>−36.59%</td>
<td>−41.70%</td>
</tr>
<tr>
<td>Iowa</td>
<td>−39.19%</td>
<td>−36.46%</td>
<td>−44.24%</td>
</tr>
<tr>
<td>Indiana</td>
<td>−42.75%</td>
<td>−45.30%</td>
<td>−39.50%</td>
</tr>
<tr>
<td>Kansas</td>
<td>−43.41%</td>
<td>−48.44%</td>
<td>−30.88%</td>
</tr>
<tr>
<td>Michigan</td>
<td>−46.33%</td>
<td>−45.21%</td>
<td>−48.10%</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>−46.96%</td>
<td>−51.26%</td>
<td>−39.46%</td>
</tr>
<tr>
<td>Missouri</td>
<td>−49.93%</td>
<td>−46.54%</td>
<td>−25.56%</td>
</tr>
<tr>
<td>Region</td>
<td>−42.51%</td>
<td>−41.72%</td>
<td>−43.77%</td>
</tr>
<tr>
<td>Nation</td>
<td>−40.15%</td>
<td>−39.23%</td>
<td>−41.67%</td>
</tr>
</tbody>
</table>

**GROWING JOBS**

Even during a recession, the level of employment in certain jobs increases. Increases may arise from the recession itself (employees working in social service industries) or as described earlier, may be driven by demographic shifts, technology, the transition of the economy to services, or other causes. Using the same methodology we employed in the area of decreasing jobs, we utilized BLS data and identified the 15 occupations that had the greatest percentage increase in number during 2005–2011 (BLS, 2012a). Excluded from the analysis were jobs
with fewer than 100,000 employees. The list of these 15 occupations and the total percentage increase in the indicated jobs for 2005–2011 follows in Table 8.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Percentage Increase (2005–2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment, recruitment, and placement specialists</td>
<td>111.33%</td>
</tr>
<tr>
<td>Personal and home care aides</td>
<td>70.37%</td>
</tr>
<tr>
<td>Personal financial advisors</td>
<td>46.60%</td>
</tr>
<tr>
<td>Nonfarm animal caretakers</td>
<td>38.85%</td>
</tr>
<tr>
<td>Medical assistants</td>
<td>35.05%</td>
</tr>
<tr>
<td>Sales representatives, services, all other</td>
<td>33.92%</td>
</tr>
<tr>
<td>Coaches and scouts</td>
<td>30.74%</td>
</tr>
<tr>
<td>Health specialties teachers, postsecondary</td>
<td>30.73%</td>
</tr>
<tr>
<td>Food servers, non-restaurant</td>
<td>29.42%</td>
</tr>
<tr>
<td>Medical secretaries</td>
<td>29.24%</td>
</tr>
<tr>
<td>Securities, commodities, and financial services sales agents</td>
<td>26.93%</td>
</tr>
<tr>
<td>Medical and health services managers</td>
<td>26.00%</td>
</tr>
<tr>
<td>Pharmacy technicians</td>
<td>25.10%</td>
</tr>
<tr>
<td>Computer software engineers, applications</td>
<td>24.09%</td>
</tr>
<tr>
<td>Computer and information systems managers</td>
<td>23.30%</td>
</tr>
</tbody>
</table>

The 15 growing jobs paint a multifaceted picture of what occurred in the 2005–2011 timeframe. The fastest growing occupation (employment, recruitment, and placement specialists) includes individuals working to help others in the job market find employment. These individuals also assist employers in discharging current employees or, conversely, in retaining the current employees and/or hiring the right employees to fill open positions. The growth of this occupational area seems to be a natural outgrowth from the large-scale job losses experienced during the recession. Also, we note that six of the top 15 jobs growth areas relate to the medical profession. This employment expansion may largely be attributable to the aging baby boomer population and to the continuing change in how health care is delivered in the United States (Truffer, Keehan, Smith, Cylus, Sisko, Poisal, & Clemens, 2010). The growth of two other occupation areas (securities, commodities, financial services sales agents, and personal financial advisors) relates in part to the aging baby boomer generation. Those working in these jobs provide advice and assistance to individuals as they invest for retirement and other future financial needs. The remaining growing jobs result from changing technology and other growth stimuli.
The final analysis reports job percentage increases by region, states within the region, and for the nation for the top 15 growth occupations for the period of study. The states are ranked by percentage job gain from greatest to smallest in Table 9.

### Table 9

<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage Increase (2005–2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wisconsin</td>
<td>49.06%</td>
</tr>
<tr>
<td>Kansas</td>
<td>46.86%</td>
</tr>
<tr>
<td>Iowa</td>
<td>46.84%</td>
</tr>
<tr>
<td>Indiana</td>
<td>43.08%</td>
</tr>
<tr>
<td>Missouri</td>
<td>40.66%</td>
</tr>
<tr>
<td>Ohio</td>
<td>38.96%</td>
</tr>
<tr>
<td>North Dakota</td>
<td>38.16%</td>
</tr>
<tr>
<td>Minnesota</td>
<td>35.93%</td>
</tr>
<tr>
<td>Michigan</td>
<td>35.83%</td>
</tr>
<tr>
<td>South Dakota</td>
<td>34.87%</td>
</tr>
<tr>
<td>Illinois</td>
<td>30.18%</td>
</tr>
<tr>
<td>Nebraska</td>
<td>17.65%</td>
</tr>
<tr>
<td>Region</td>
<td>38.00%</td>
</tr>
<tr>
<td>Nation</td>
<td>38.87%</td>
</tr>
</tbody>
</table>

The most interesting aspect of this table’s information arises when we compare Table 9, state rankings for expansion in the top 15 growing jobs, to Table 7, state rankings for decline in the top 15 of shrinking jobs. For example, the top two states in top 15 job growth, Wisconsin and Kansas (Table 9) are also the top two states in Top 15 non-construction job loss (Table 7). Conversely, although not all states follow this trend, the four states with the smallest top 15 non-construction job loss (Table 7), South Dakota, North Dakota, Minnesota, and Illinois also ranked in the bottom half of included states regarding top 15 job growth (Table 9). Although it appears that most Midwestern states follow national trends in both job loss and job growth, many variables not noted herein may affect these numbers. Thus definitive conclusions can only be inferred. Additional analysis should be undertaken to further explain the relationship between types of jobs lost and/or gained within a state and region. Included should be analysis of the potential long-term positive and negative outcomes to states that actively
“lead” in the transition from shrinking job types to jobs experiencing growth, as opposed to those states that appear to make that transition more slowly.

CONCLUSION

As our investigation has shown, the effects of the most recent recession continue to persist in the U.S. economy and appear to have altered the make-up of the U.S. workforce, such as increases in human capital within the workforce, captured as increases in educational attainment. This may, in the long-term, benefit not only individuals but also states and regions as a whole. Shifts in the labor market also revealed changes in public versus private sector employment, showing an overall increase in public sector jobs during the period under investigation. A clear shift in employment from manufacturing jobs to service sector industries is also observed, although evidence to suggest that global manufacturing leaders such as China experience manufacturing to service shifting as well (BCG, 2011). This may, in part, influence certain niche manufacturing jobs to move back to U.S. shores; however, it would seem likely that the overall trend to off-shore manufacturing will continue into the near future.
## Appendix 1
### Population by State (2011)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>8,521,694</td>
<td>5,926,849</td>
<td>1,090,777</td>
<td>1,238,711</td>
<td>1,238,711</td>
<td>1,238,711</td>
<td>1,238,711</td>
<td>219,060</td>
<td>121,040</td>
</tr>
<tr>
<td>Indiana</td>
<td>4,255,459</td>
<td>2,934,500</td>
<td>540,443</td>
<td>777,643</td>
<td>777,643</td>
<td>777,643</td>
<td>777,643</td>
<td>110,860</td>
<td>52,110</td>
</tr>
<tr>
<td>Iowa</td>
<td>2,027,201</td>
<td>1,538,756</td>
<td>190,557</td>
<td>358,530</td>
<td>358,530</td>
<td>358,530</td>
<td>358,530</td>
<td>54,170</td>
<td>36,640</td>
</tr>
<tr>
<td>Kansas</td>
<td>1,852,094</td>
<td>1,389,038</td>
<td>185,209</td>
<td>293,087</td>
<td>293,087</td>
<td>293,087</td>
<td>293,087</td>
<td>59,360</td>
<td>28,170</td>
</tr>
<tr>
<td>Michigan</td>
<td>6,588,324</td>
<td>4,191,878</td>
<td>737,892</td>
<td>1,014,434</td>
<td>1,014,434</td>
<td>1,014,434</td>
<td>1,014,434</td>
<td>156,980</td>
<td>54,860</td>
</tr>
<tr>
<td>Minnesota</td>
<td>3,560,801</td>
<td>2,728,881</td>
<td>284,864</td>
<td>592,167</td>
<td>592,167</td>
<td>592,167</td>
<td>592,167</td>
<td>152,440</td>
<td>63,180</td>
</tr>
<tr>
<td>Missouri</td>
<td>4,008,554</td>
<td>2,742,057</td>
<td>497,061</td>
<td>553,896</td>
<td>553,896</td>
<td>553,896</td>
<td>553,896</td>
<td>127,060</td>
<td>51,070</td>
</tr>
<tr>
<td>Nebraska</td>
<td>1,196,112</td>
<td>943,643</td>
<td>107,650</td>
<td>184,954</td>
<td>184,954</td>
<td>184,954</td>
<td>184,954</td>
<td>32,860</td>
<td>26,090</td>
</tr>
<tr>
<td>North Dakota</td>
<td>448,145</td>
<td>370,830</td>
<td>41,677</td>
<td>63,783</td>
<td>63,783</td>
<td>63,783</td>
<td>63,783</td>
<td>10,210</td>
<td>10,690</td>
</tr>
<tr>
<td>Ohio</td>
<td>7,749,236</td>
<td>5,213,453</td>
<td>906,661</td>
<td>1,214,735</td>
<td>1,214,735</td>
<td>1,214,735</td>
<td>1,214,735</td>
<td>228,170</td>
<td>101,910</td>
</tr>
<tr>
<td>South Dakota</td>
<td>537,588</td>
<td>415,623</td>
<td>50,533</td>
<td>77,722</td>
<td>77,722</td>
<td>77,722</td>
<td>77,722</td>
<td>8,780</td>
<td>11,280</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>3,831,373</td>
<td>2,819,477</td>
<td>367,812</td>
<td>749,981</td>
<td>749,981</td>
<td>749,981</td>
<td>749,981</td>
<td>122,450</td>
<td>50,310</td>
</tr>
</tbody>
</table>
## Appendix 2
### Population Change by State (2005–2011)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>−64,646</td>
<td>−379,297</td>
<td>239,420</td>
<td>−39,124</td>
<td>20,595</td>
<td>50,780</td>
<td>−74,530</td>
</tr>
<tr>
<td>Indiana</td>
<td>−41,195</td>
<td>−200,333</td>
<td>146,662</td>
<td>5,736</td>
<td>13,613</td>
<td>33,380</td>
<td>−38,910</td>
</tr>
<tr>
<td>Iowa</td>
<td>−9,853</td>
<td>−80,999</td>
<td>72,664</td>
<td>33,043</td>
<td>1,362</td>
<td>17,280</td>
<td>−23,610</td>
</tr>
<tr>
<td>Kansas</td>
<td>−9,809</td>
<td>−72,594</td>
<td>65,218</td>
<td>27,614</td>
<td>8,136</td>
<td>18,940</td>
<td>−21,610</td>
</tr>
<tr>
<td>Michigan</td>
<td>−101,170</td>
<td>−420,294</td>
<td>77,335</td>
<td>−309,672</td>
<td>−28,039</td>
<td>41,410</td>
<td>−47,350</td>
</tr>
<tr>
<td>Minnesota</td>
<td>−14,724</td>
<td>−155,411</td>
<td>137,571</td>
<td>13,514</td>
<td>40,290</td>
<td>−26,730</td>
<td></td>
</tr>
<tr>
<td>Missouri</td>
<td>−62,380</td>
<td>−173,196</td>
<td>150,112</td>
<td>−18,077</td>
<td>18,949</td>
<td>36,730</td>
<td>−50,920</td>
</tr>
<tr>
<td>Nebraska</td>
<td>−8,883</td>
<td>−36,187</td>
<td>41,641</td>
<td>34,705</td>
<td>12,209</td>
<td>4,930</td>
<td>−13,020</td>
</tr>
<tr>
<td>North Dakota</td>
<td>−7,176</td>
<td>−11,896</td>
<td>18,547</td>
<td>34,800</td>
<td>3,361</td>
<td>2,820</td>
<td>−1,540</td>
</tr>
<tr>
<td>Ohio</td>
<td>−107,860</td>
<td>−357,637</td>
<td>187,786</td>
<td>−99,752</td>
<td>−3,732</td>
<td>63,970</td>
<td>−63,090</td>
</tr>
<tr>
<td>South Dakota</td>
<td>−4,840</td>
<td>−11,311</td>
<td>22,560</td>
<td>19,394</td>
<td>8,129</td>
<td>2,270</td>
<td>−1,620</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>−33,043</td>
<td>−159,220</td>
<td>127,931</td>
<td>31,559</td>
<td>16,513</td>
<td>40,300</td>
<td>−44,550</td>
</tr>
</tbody>
</table>
REFERENCES


The Importance of Expenditures for Higher Education Graduation Rates

Casey R. Abington
Northwest Missouri State University

ABSTRACT
The Great Recession of 2007–2009 left many colleges and universities with reduced appropriations and declining budgets. In addition, many institutions are moving toward some form of performance-based state funding. Facing these trends, institutions have had to make difficult decisions about where to spend and where to make cuts. A key question to consider is how expenditures affect student success. This paper addresses this question by analyzing the importance of expenditures for higher education graduation rates. Panel data covering 2007–2011 is employed to examine graduation rates at four-year public colleges and universities. Two functional expenditure categories are included in the fixed effects model along with other institutional and demographic variables considered important for graduation rates. The results suggest that expenditures on student services have a marginally significant, direct effect on graduation rates, while expenditures on academic support are shown to be insignificant. ACT scores and enrollment levels are shown to have the most important contributions to graduation rates.

Keywords: higher education, graduation rates, expenditures

INTRODUCTION AND LITERATURE REVIEW
The Great Recession has had a dramatic impact on higher education. The recession, beginning in 2007, resulted in a sharp decline in state revenues, which in turn led to a decrease in appropriations for higher education. In February 2009, President Obama signed into law the American Recovery and Reinvestment Act (ARRA), which helped offset the decline in state and local education funding. However, as the funds from the ARRA have been exhausted, state funding for higher education is about 4% lower than before the start of the
recession in 2007, and more than half of the states appropriated less for higher education in 2012 than five years prior (Kelderman, 2012). According to the National Association of State Budget Officers, full recovery from the decline in state revenues will likely take several years (SHEEO, 2012). Furthermore, in a report detailing trends in state funding for higher education, Mortenson (2012) claims, “Based on the trends since 1980, average state fiscal support for higher education will reach zero by 2059 … ” (p. 27). Given this information, it is probable that universities will continue to face tight budgets and have to make tough decisions regarding expenditures on various aspects of education.

Another trend facing colleges and universities is the possibility of performance-based funding. Until recently, most institutions received state funding based solely on enrollment levels, but now there is a shift toward adding a form of performance-based funding. The most common performance measures are retention and graduation rates, but others include time to degree, transfer rates, and the number of low-income or minority graduates (NCSL, 2013). According to the National Conference of State Legislatures (NCSL, 2013), there are 12 states that currently have performance-based funding—Illinois, Indiana, Louisiana, Michigan, Minnesota, New Mexico, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, and Washington. Additionally, four states—Arkansas, Colorado, Missouri, and Virginia—are transitioning to some form of performance-based funding. Given these trends, a key question to consider is how important funding and expenditures are for student success and performance.

This paper focuses on the relationship between higher education expenditures and graduation rates for four-year public colleges and universities in the U.S. Table 1 summarizes the change from 2007–2012 in full-time equivalent (FTE) enrollment and in education appropriations per FTE for public higher education. On average, these public institutions experienced five-year enrollment growth of 15.6%, while average higher education appropriations decreased by 23.0% over the same period. The increase in enrollment is not surprising since it is typical for higher education enrollment to increase during times of recession. This increase in enrollment coupled with the decrease in appropriations has led to a significant decline in higher education spending per student.

There are relatively few studies that focus directly on the relationship between higher education expenditures and graduation rates, but those that do tend to find a significant relationship. The inconsistencies in results are likely attributable to differences in methodology. Hamrick, Schuh, and Shelley (2004) find a significant positive relationship between expenditures on instruction, library, and academic support (minus library spending) and graduation rates at public baccalaureate institutions based on 1998 data. Scott, Bailey, and Kienzl (2006) compare graduation rates for public and private institutions and determine that public institutions appear to use resources more effectively than private. Gansemer-Topf and Schuh (2006) focus on private baccalaureate institutions
and show that institutional selectivity and institutional expenditures, especially those that contribute to academic integration, are important for graduation rates. Examining public four-year institutions, Zhang (2009) finds some evidence that state funding is significantly, positively related to graduation rates. Webber and Ehrenberg’s (2010) results show that student service expenditures help predict graduation rates and furthermore, the marginal effects are higher at institutions with lower entrance test scores and higher Pell Grant expenditures. Finally, Morrison (2012) finds that total expenditures per FTE have a positive relationship with graduation rates for both private and public institutions.

<table>
<thead>
<tr>
<th>U.S. Public Higher Education Enrollment and Appropriations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FY2007</strong></td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>Public Higher Education FTE Enrollment</td>
</tr>
<tr>
<td>Educational Appropriations per FTE</td>
</tr>
</tbody>
</table>

Source: SHEEO, 2012 Table 4 and Table 5.

Note: Appropriations are state and local support available for public higher education operating expenses.

This paper contributes to the literature by using updated panel data covering 2007–2011 to examine the relationship between expenditures and graduation rates at four-year public universities. The study focuses on the time period that includes the most recent recession which, as discussed previously, led to a decrease in state appropriations and budget cuts for many public colleges and universities. The analysis includes two separate functional components of higher education spending—academic support and student services—to examine the relationship with graduation rates. Relatively few studies that explore the determinants of graduation rates separate expenditures into the different functional components. Of the studies that do, there is not agreement on which particular areas of spending are important for graduation rates.

**METHODOLOGY**

**Model**

Graduation rates are a common outcome measure for studies of higher education. Graduation rates can be modeled as a function of a variety of institutional and student characteristics. This study includes expenditure variables along with other institutional and demographic variables that are
expected to, and have been shown to be, important determinants of graduation rates. Many studies have found that student characteristics are important determinants of graduation rates (Blose, 1999). For example, Astin and Oseguera (2002) find that test scores, race, and gender affect retention and graduation rates. Webber and Ehrenberg (2010) find financial aid (Pell Grant dollars per FTE), proportion African American students, and SAT scores to be significant variables. Furthermore, Scott et al. (2006) state that demographic characteristics such as race and gender are included in their model because the omission of these variables would lead to inaccurate results. They assert that individual graduation rates differ by gender and race, so it should be expected that colleges with unequal numbers of women or minorities are likely to have different graduation rates, ceteris paribus. The results of their 2006 study show that the size of the university, proportion of enrollment that is female, and proportion of enrollment that is minority all significantly impact graduation rates.

Institutional and demographic variables are included in this study to reflect differences across universities and students. The previous literature stresses the importance of accounting for these variables when modeling graduation rates. As such, the model and Equation (1) is specified as:

\[
\text{GRADRATE} = f(\text{ACADEMIC, STUDENT, ENROLL, FINAID, ACT25, FEMALE, MINORITY})
\]  

\( \text{(1)} \)

**Data**

Equation (1) was estimated using panel data spanning five years (2006–2007 to 2010–2011) for 402 public four-year colleges and universities in the U.S. All data are final release data from the IPEDS (Integrated Postsecondary Education Data System) published by the National Center for Education Statistics (2013). The dependent variable, GRADRATE, is the 6-year graduation rate of “total number of completers within 150% of normal time divided by the revised adjusted cohort” (graduation rate, n.d.). This rate reflects the proportion of students who complete a bachelor’s degree within 150% of normal time (National Center for Education Statistics, 2013). GRADRATE is the most common performance measure for higher education institutions.

Two functional expenditure components are included in the analysis. ACADEMIC is academic support expenditures per FTE and includes “expenses of activities and services that support the institution’s primary missions of instruction, research, and public service” (academic support, n.d.). STUDENT is student services expenditures per FTE and includes “expenses for admissions, registrar activities, and activities whose primary purpose is to contribute to students emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program” (student services, n.d.).
In addition to the expenditure variables, the model includes five variables that represent differences across institutions and students. ENROLL is the total number of full-time undergraduate students enrolled. This variable reflects the size of the university. FINAID measures the percent of full-time undergraduates who are receiving some type of financial aid. ACT25 is the ACT composite score at or below which 25% of students submitting scores to an institution scored. FEMALE is the percentage of undergraduate enrollment that is female. Finally, MINORITY is the percentage of undergraduate enrollment that is African American, Hispanic, Asian, Hawaiian, or Pacific Islander.

Prior to estimation, the data was examined to ensure that it meets the assumptions required for analysis. After inspection of the data, outliers were eliminated. Summary statistics for all variables are shown below in Table 2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRADRATE</td>
<td>2490</td>
<td>46.192</td>
<td>16.752</td>
<td>9</td>
<td>94</td>
</tr>
<tr>
<td>ACADEMIC</td>
<td>2485</td>
<td>1847.798</td>
<td>1096.954</td>
<td>129</td>
<td>10826</td>
</tr>
<tr>
<td>STUDENT</td>
<td>2485</td>
<td>1417.255</td>
<td>650.160</td>
<td>319</td>
<td>5283</td>
</tr>
<tr>
<td>ENROLL</td>
<td>2490</td>
<td>12333.870</td>
<td>10828.480</td>
<td>367</td>
<td>70440</td>
</tr>
<tr>
<td>FINAID</td>
<td>2490</td>
<td>83.252</td>
<td>10.817</td>
<td>42</td>
<td>100</td>
</tr>
<tr>
<td>MINORITY</td>
<td>2490</td>
<td>25.957</td>
<td>26.034</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>FEMALE</td>
<td>2490</td>
<td>56.425</td>
<td>9.009</td>
<td>8</td>
<td>91</td>
</tr>
<tr>
<td>ACT25</td>
<td>1884</td>
<td>19.575</td>
<td>2.624</td>
<td>9</td>
<td>28</td>
</tr>
</tbody>
</table>

**Estimation**

Equation (1) was estimated via a fixed effects model as well as a random effects model using STATA™. A Hausman test was performed to determine which model is preferred. The Hausman test indicates whether the models give similar and consistent results. The Hausman test showed that the results of the random effects model were quite different from those of the fixed effects model. This suggests that the random effects estimates are inconsistent and biased due to failure to control for omitted variables. Therefore, fixed effects is the preferred model. The fixed effects technique helps to control for omitted variable bias.

A modified Wald test was performed to detect the presence of heteroskedasticity. The test indicated that heteroskedasticity was indeed present. While heteroskedasticity does not result in biased parameter estimates, it can lead to biased standard errors. To control for the heteroskedasticity problem, the model was run with robust standard errors.
The data was also tested for multicollinearity using variance inflation factors (VIFs). The general rule of thumb is to be concerned about variables with VIFs greater than 10.0. The results show that none of the variables have a VIF greater than 1.99. So, there does not appear to be a multicollinearity problem.

Results

The fixed effects estimates of Equation (1) are shown below in Table 3. Coefficient estimates are given with the standard errors in parentheses below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Equation (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACADEMIC</td>
<td>0.0000317</td>
</tr>
<tr>
<td></td>
<td>(.0002671)</td>
</tr>
<tr>
<td>STUDENT</td>
<td>0.006037</td>
</tr>
<tr>
<td></td>
<td>(.0004114)</td>
</tr>
<tr>
<td>FINAID</td>
<td>.05788</td>
</tr>
<tr>
<td></td>
<td>(.0148344)</td>
</tr>
<tr>
<td>MINORITY</td>
<td>.0684945</td>
</tr>
<tr>
<td></td>
<td>(.0535725)</td>
</tr>
<tr>
<td>FEMALE</td>
<td>.0607632</td>
</tr>
<tr>
<td></td>
<td>(.0840169)</td>
</tr>
<tr>
<td>ACT25</td>
<td>.2788934**</td>
</tr>
<tr>
<td></td>
<td>(.1244375)</td>
</tr>
<tr>
<td>ENROLL</td>
<td>.0003266***</td>
</tr>
<tr>
<td></td>
<td>(.0000917)</td>
</tr>
<tr>
<td>Constant</td>
<td>31.87749</td>
</tr>
<tr>
<td></td>
<td>(5.6699888)</td>
</tr>
</tbody>
</table>

Note: * p < .10, ** p < .05, *** p < .01

The results do not support the hypothesis that academic support and student services expenditures will positively affect graduation rates. The fixed effects model estimation of Equation (1) shows that neither academic support nor student service expenditures are a significant predictor of graduation rates (p > .10). The sign on each coefficient is positive as expected from both a theoretical and intuitive viewpoint, but the insignificance of the variables is unexpected. Academic support expenditures include spending associated with instruction, research, and public service. It was expected that spending on instruction, in particular, would contribute significantly to graduation rates. However, this was not found to be the case. To explore this further, the same model was estimated using instruction expenditures in place of academic support expenditures. This
narrower spending category that focuses on instruction was found to have a positive yet still insignificant effect \( (p > .10) \) on graduation rates. A possible reason for this finding was proposed by Gansemer-Topf and Schuh (2006). They suggested that institutions may not be devoting enough funds to academic support expenditures for the expenditures to be effective. This appears to be a sensible explanation here given the lower budgets faced by many institutions.

Student services expenditures (STUDENT) include spending associated with “admissions, registrar activities, and activities whose primary purpose is to contribute to students emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program. Examples include student activities, cultural events, student newspapers, intramural athletics, student organizations, supplemental instruction outside the normal administration, and student records” (student services, n.d.). The estimation results show that student service expenditures have a positive yet insignificant effect \( (p > .10) \) on graduation rates. Given that the purpose of these expenditures is to increase students’ physical and emotional well-being, it was expected that they would be more important for graduation rates. However, this is an aggregated category that includes a wide variety of services. It is likely that some of the services included are more important for graduation rates than others. Perhaps the services that do have a significant positive impact are being overshadowed by those that do not. Ryan (2004) suggested that it is possible that student services expenditures are an insignificant determinant because the services included in the category may be areas where institutions have less experience and training, which causes spending to be less effective.

Another explanation for why the expenditure categories are not significant determinants is that student and institutional characteristics determine graduation rates rather than spending. Total full-time undergraduate enrollment (ENROLL) and ACT scores (ACT25) were shown to be the most important variables in determining graduation rates \( (p < .01 \text{ and } p < .05, \text{ respectively}) \). Larger enrollment and higher ACT scores are associated with higher graduation rates. These results both make theoretical and intuitive sense. Schools with large enrollments may have economies of scale in graduating students. Students with higher ACT scores may have greater abilities that increase their likelihood of academic success. In addition to enrollment and ACT scores, there may be other important institutional and student characteristics that help determine graduation rates.

Since it is possible that expenditures are not linearly related to graduations rates (i.e., there might be diminishing returns), another set of regressions was run using quadratic variables for both academic and student services expenditures. The estimation results were similar to those of Equation (1). The expenditure variables (ACADEMIC and STUDENT) and their quadratics were all shown to be insignificant in determining graduation rates.
CONCLUSION

The Great Recession led to a decline in state appropriations for higher education and left colleges and universities facing tight budgets. In addition, many institutions are moving toward some form of performance-based funding and away from a system that bases state funding solely on enrollment levels. In the midst of these trends, it is imperative that education dollars are spent efficiently. This paper examines the importance of expenditures on academic support and student services for graduation rates at four-year public institutions in the U.S. The results show that spending on neither academic support nor student services is statistically significant in determining graduation rates. This study suggests that expenditures on higher education at four-year colleges and universities have less impact on student success as measured by graduation rates than other factors such as enrollment levels and ACT scores. Therefore, the impact of the Great Recession on expenditures should not have had a significant effect on graduation rates, ceteris paribus.

This study has some limitations and raises many additional research questions. The most significant limitation is the aggregated nature of the expenditure categories. Both academic support and student services are comprised of many different types of spending on a variety of services and activities. Future research is necessary to determine which, if any, of the particular aspects of each functional category of spending are important predictors of graduation rates.

In addition to graduation rates, retention is another important performance measure for colleges and universities. Performance funding is often based on retention, not just completion of degrees. As such, this study could be extended to examine the impact of expenditures on retention rates. Another interesting question raised by the topic of performance-based funding is how colleges and universities respond to the incentives. Are schools lowering selectivity (i.e., lowering test score requirements) in order to increase enrollment? Or, are schools raising selectivity in order to increase retention and graduation rates? These and many other questions will be important for colleges and universities seeking to increase enrollment and student success while facing budget constraints.
REFERENCES


Relationships Between Students’ Psychological Capital, Mentoring, and Career Commitment

Linda Duke
William Woods University

Julie “J.P.” Palmer-Schuyler
Webster University

ABSTRACT
This research presents the results of a study investigating whether a relationship exists between mentoring experiences, psychological capital (PsyCap), and career commitment for students involved in a collegiate extra-curricular organization. Findings indicate that as levels of PsyCap increase, student career commitment increases; in addition, mentoring quality (as perceived by the mentee) partially mediates the relationship between PsyCap and career commitment. The hypothesized model was supported, indicating that mentoring and PsyCap interact in an important way to influence student career commitment, suggesting that students who participate in extra-curricular organizations such as Collegiate DECA may be more decisive about choosing a career path.

Keywords: students’ career commitment, mentoring, psychological capital

INTRODUCTION
Young people today face a great deal of uncertainty regarding their education and deciding upon career opportunities (Gutman & Schoon, 2012). A variety of constructs attempt to explain readiness for career decision-making (i.e., why some individuals experience difficulty in making career decisions and others do not) including career maturity (Super, 1990), vocational identity (Holland, 1997), career decision-making self-efficacy (Taylor & Betz, 1983), and career indecision (Jones, 1989). Over 30 years of research on mentoring has confirmed the value of mentoring relationships on these constructs, and this study extends
the study of mentoring specifically to perceptions of career commitment, which is theoretically and often empirically found to be a precursor to these constructs.

One goal of this study was to examine whether the mentoring received in an extra-curricular entrepreneurship organization (Collegiate DECA) influences students with regard to their career commitment. Collegiate DECA is a student organization that promotes leadership and provides differential career information, networking, and vocational experiences (Pittaway, Rodríguez-Falcon, Aiyegbayo, & King, 2011). Several questions that were addressed in this study included the following: In today’s economic and competitive times, does student membership in these types of organizations “jump-start” students into the best career fit? Are these students more committed to their careers? Does the impact of mentoring experienced through these types of organizations benefit students with regard to their career choices?

SUPPORTIVE LITERATURE

According to Clark (2005), students often choose classes related to their major, but do not spend much time focusing on a career. Many of these students falsely believe that a career will be waiting for them once they complete their degrees and may not believe that early career planning is necessary. Thus, it might additionally be relevant and important for today’s educators to address this issue with students to maximize their exposure to career types and present them with vocational information and opportunities to make a commitment to a career. For example, Gutman and Schoon (2012) suggest that uncertainty in career aspirations is related to fewer job opportunities in British students. One of the ways that faculty can assist students toward employability in their college years is to encourage students to join organizations beginning in their freshman year of college (McCorkle, Alexander, Reardon, & Kling, 2003). McCorkle et al. found that “B” average students that have more experience, training, and confidence often land better jobs than “A” average students, in part through their extensive involvement with organizations on campus.

MECHANISMS THAT INFLUENCE STUDENT CAREER DECISIONS

Multiple studies have shown support for the construct of mentoring affecting attitudes and actions regarding students’ decisions in career choices, and also indicate the added value of mentoring to the student and their choice of careers (Allen, Eby, Poteet, Lentz, & Lima, 2004; Dirsmith & Covaleski, 1985; Fagenson, 1989; Godshalk & Sosik, 2003; and Noe, 1988). Many universities today require their business students to participate in an internship. According to Coco (2000), internships are just one venue that allows college students a “natural bridge between college work and the work world” (p. 41) and three out of four students complete internships before their college graduation. Coco’s study is just one of several studies that call for more cooperative education as an extension of the
classroom for college students. Various types of experiential learning with the addition of faculty mentoring can assist students through increased exposure to career options upon graduation (Frazee, 1997; Gutman & Schoon, 2012). Internships are recognized as valuable for helping the student to be better prepared for his or her job(s) upon graduation because of the real-life experience obtained during the internship (Coco, 2000). Studies involving vocational education note that vocational graduates are better prepared for their careers, experience less unemployment, receive raises quicker, and average a higher monthly income (Kaufman & Lewis, 1969). According to Kaufman and Lewis there is a need for exploration and expansion of the vocational training theory even above the internship requirement for the traditional university student and there is a need for occupational training opportunities to accompany the textbook education. Students who have experienced both traditional university learning along with occupational training consider themselves better prepared for their first jobs (Frazee, 1997). Research regarding useful career advice and opportunity investigation suggests that these factors often decrease uncertainty in career aspirations and increase perceptions of vocational choice (Gutman & Schoon, 2012).

In a similar vein, many universities promote membership in extra-curricular collegiate business organizations such as Collegiate DECA to promote students’ hands-on learning and provide career information that may be in addition to, or in place of, the internship experience so graduates may be better equipped to select a career. Along with being better prepared for their first jobs, students who engaged in these extra-curricular organizations often have a higher confidence level, perform better, and are more likely to receive quicker promotions and raises (Kaufman & Lewis, 1969). Mixed methods of learning may assist students in choosing the best career path for their future and provide a more relevant experience, which may increase student levels of psychological capital through the quality mentoring provided in these types of collegiate organizations and experiences.

**RESEARCH QUESTION**

The primary research question this study investigated was: Is there a relationship between student PsyCap and student career commitment and does mentoring partially mediate that relationship?

Figure 1 illustrates the model proposed for this research. Most prior research has involved formal mentoring programs (internships) and its effects. This research instead focused on the informal mentoring provided by a faculty member serving as an adviser/mentor to university students involved in the entrepreneurship organization of Collegiate DECA and the mentoring received by other, more tenured students in these collegiate organizations. Following the model, each construct is briefly discussed independently before the hypotheses are presented.
According to Rogers, Monteiro, and Nora (2008), mentoring is an important skill for faculty and should be included in future development of academic programs. Similarly, Allen et al. (2004) noted that positive mentoring has been shown to benefit students across their entire lifespans. Jacobi (1991) suggests that mentoring and enrichment strategies for undergraduate and graduate education include subgroups such as student organizations and that these serve as an informal mentoring process that increases student learning and also provides career development opportunities. Recent mentoring research by Dougherty, Dreher, Arunachalum, and Wilbanks (2013) and Gutman and Schoon (2012) suggest that mentoring quality differentially affects career aspirations and vocational identity, and both studies call for more research regarding the extent to which mentoring may affect individual outcomes related to one's career choice.

Thus, to address these calls for more research, this study investigated whether perceptions of mentoring quality was related to perceived career commitment in a collegiate student organization. While the concept of mentoring has been traced back to the Greek myth of Odysseus, this study used a contemporary conceptualization of mentoring offered by Kram (1983) who suggests that “Mentoring ... serves to provide career development and psychosocial assistance in the form of coaching, protection, exposure, and career opportunities” (p. 45).

Parson (1909) was perhaps the first to begin studying career indecisiveness and designed unique methods of identifying individuals as career-decided or career-undecided. Since Parson’s seminal research, studies involving career indecisiveness has greatly expanded. According to Feldt, Ferry, Bullock, Carmarotti-Carvalho, Collingwood, Eilers, Meyer, Nurre, and Woelfel (2010), college students face one of the most important decisions they will ever make when they decide on a career. Smart, Feldman, and Ethington (2006) indicate that the interest in contextual factors affecting student success after college suggests a need for continued research regarding mentoring influences of the
college environments and how certain aspects of the college environment may affect commitment toward a career. Furthermore, Smart et al. (2006) suggest that both psychological and sociological components are necessary for student stability, satisfaction, and achievement and that psychological considerations may very well surpass attention to sociological consideration; while the college environment is an important part of ensuring college student’s success, there needs to be equal attention given to the psychological components that add to the student’s commitment and success. An even stronger statement was made by Feldman and Newcomb (1969) that these types of generalizations can and should be made across studies of major-field effects:

“The evidence is clear … that differential experiences in the several major fields do have impacts beyond those attributable to initial selection into those fields. Perhaps the most convincing evidence of this is the prevalence of the accentuation of initial major-field differences. It has been shown that preexisting differences in characteristics typical of student initially choosing different curricular tend to become more pronounced follow experience in terms of those major fields” (p. 193, as quoted by Feldman & Newcomb, 1969 in Holland, 1997).

Larson, Toulouse, Ngumba, and Fitzpatrick (1994) and Ng and Feldman (2009) indicate that there are content areas that need to be included when assessing how individuals cope with career indecision: their subjective career distress and the obstacles they perceive, their active problem solving, and their academic self-efficacy. Sampson, McClain, Musch, and Reardon (2014) call for more research into factors that create a high level of readiness for career choice and then contribute to career decision-making and career commitment (Dougherty, et al., 2013).

Smart et al. (2006) insist that a student’s success is more than learning, growth, or test scores and grades. In addition, they suggest that college classroom education should be more diverse with the addition of student-based learning outside of the classroom. This study extended these calls for more research on experiential learning and suggests that students’ psychological capital may be related to career commitment and also may be affected by the mentoring that a student receives in an extra-curricular organization.

**Psychological Capital (PsyCap)**

PsyCap uses the theoretical framework of social cognitive theory (Bandura, 1997) and is summarized by Luthans, Norman, Avolio, and Avey (2008) as a meta-construct that has many different relationships with outcome variables that may predict work attitudes and behavior. Luthans et al. (2008) define PsyCap as:
“An individual’s positive psychological state of development that is characterized by: (a) having confidence (self-efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (b) making a positive attribution (optimism) about succeeding now and in the future; (c) persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (d) when beset by problems, and adversity, sustaining and bouncing back and even beyond (resilience) to attain success” (p. 432).

PsyCap, together with positive individual support, is essential for individuals to achieve related growth and performance, which can often be aggregated to the organizational level. According to Luthans and Youssef (2004), a supportive climate is a necessity and Luthans et al. (2008) further indicate that each component of PsyCap shares positive expectancies regarding the future. Additionally, the amount of support that one receives is a key component with respect to how PsyCap influences individual outcomes, and by extension, mentoring may in fact be perceived as a type of positive individual support that interacts with PsyCap to affect individual outcomes related to their careers.

Page and Donohue (2004) discuss the overlapping values of these PsyCap components and their corresponding importance to assisting management practitioners. If managers understand the dimensions and the affective state associated with the four dimensions, PsyCap may in fact be a valuable tool as well as an indication of organizational worth (Page & Donohue, 2004). Page and Donohue (2004) also conclude that there is a large degree of overlap regarding the elements of PsyCap, but the model consists of various dimensions of human contributions to organizations in distinct ways that are all interrelated constructs partially responsible for positive outcomes in organizations. It seems logical to suggest that, on an individual basis, PsyCap may be related to the individual outcome of career commitment as each of the four components of PsyCap (hope, optimism, resiliency, and efficacy) share expectancies regarding the future, which arguably is one of college students’ primary concerns.

Hypotheses

The following hypotheses were derived from the model (Figure 1):

Hypothesis 1: PsyCap is positively related to students’ career commitment.

Hypothesis 2: Mentoring partially mediates the relationship between students’ PsyCap and students’ career commitment.

METHODOLOGY

Approval from the University’s Institutional Review Board was granted to conduct a pilot study, which consisted of administering a written survey in
person by the researchers using a questionnaire at a Collegiate DECA state competition in 2012. This purposive sample included university students, most of whom are business students, although the organization and related events are not limited to business students. All students were undergraduates who were active members of Collegiate DECA and who attended the competition. After receiving feedback from the participating students, substantial changes were made in the survey for the research to be conducted subsequently on a larger, more diverse population at Collegiate DECA International Competition.

IRB approval for the second study was acquired and the 50 question survey (in four versions) was administered in person to the Collegiate DECA students who attended the International Conference and were active members of Collegiate DECA at their respective universities. As an incentive, participating students were entered into a drawing for one of two $100 prizes. No other type of compensation or credit was offered for completing the survey; however, students who participated were given 30 minutes that had been formally scheduled during the International Conference agenda.

**Measurements of Data Gathered for Study**

The survey contained 50 questions using five-point Likert scales (A = “Strongly Disagree” to E = “Strongly Agree”). Four reordered versions of the survey (with respect to the ordering of the questions presented) were administered to minimize survey fatigue with respect to the variables. For example, Survey Version A included the mentoring questions immediately following the demographic questions, Survey Version B included the PsyCap questions immediately following the demographic questions, and so on. Demographic questions comprised the first 14 questions of the survey (additional questions for the purposes of information for the Collegiate DECA organization were added and included questions regarding number of years as a participant, past competitions attended, and so on but were not used in this analysis).

**Demographics**

Demographics included students’ number of years in Collegiate DECA, previous work experience, high school DECA experience, and current class standing.

**Mentoring**

Perceptions of how strongly Collegiate DECA students believe their involvement positively assists them as a form of informal mentoring were accessed by adapting the Berk, Berg, Mortimer, Walton-Moss, and Yeo (2005) 12-item mentoring relationship scale. Sample items include: (a) “Collegiate DECA is helpful in providing direction and guidance of professional issues” (e.g., networking), and (b) “Collegiate DECA and/or my adviser challenged me to extend my abilities.” The Cronbach’s Alpha for this scale is .92.
Psychological Capital

The 16-item Luthans et al. (2008) psychological capital scale was used to measure levels of each component of psychological capital (efficacy/confidence, hope, optimism, and resiliency). Sample items include: a) “My experience with Collegiate DECA helps me to feel confident,” and b) “My experience with Collegiate DECA helps me to see myself as being pretty successful at going forward.” The Cronbach's Alpha for this scale is .93.

Career Commitment

Eight items were adapted from Blau’s (1985) Career Commitment Questionnaire. Sample items include: (a) “I do not feel a strong sense of belonging to my current career choice” (reverse-coded), and (b) “I think I could easily become attached to another career as opposed to what I am participating in with Collegiate DECA” (reverse-coded). The Cronbach's Alpha for this scale is .71.

DATA ANALYSIS & RESULTS

An a priori power analysis (Cohen, 1988) was performed to determine the appropriate sample size necessary given the specified model and the number of scale items and constructs. G*Power 3 (web-based stand-alone power analysis program) indicated that with a 90% confidence level desired, and a 5% margin of error, a sample size of 230 (of the 1,000 possible survey participants at the conference) was adequate. Addressing the second concern beyond sample size, Nunnally’s (1978) suggestion that the subject to item ratio for factor analysis to be no less than 10 to 1 indicates a sample size of 360 (given the 36 items comprising the three constructs under investigation) while other psychological research statisticians such as Hatcher (1994, p. 325–339) recommend a minimum subject to item ration of at least 5 to 1, which would indicate a sample size of 180. Conservatively, the authors attempted to reach a sample size as suggested by Nunnally’s (1978) subject to item ration and thus, the targeted sample size was 360.

SPSS Version 21.0 was used to check data for normality, examine frequencies, perform correlation analysis, exploratory and confirmatory factor analyses, and regression analyses. There were 921 surveys distributed with a return of 281. Of those 281 completed surveys, 16 cases were removed from the analysis as there was no student consent recorded, which was necessary under the terms of the Institutional Review Board's approval. The sample fell short of reaching a subject to item ration of 10 to 1 but exceeded the ration of 5 to 1. The final response rate of 265 surveys completed was 28.8%.

Table 1 presents the means, standard deviations, and intercorrelations among the study variables for each of the three variables in the model with the four control variables (class standing, work experience, high school DECA experience,
and Collegiate DECA experience). Cronbach’s alpha coefficients for the scales are presented along the diagonal in parentheses. All scales met the acceptable standards of reliability (above .70; Hair, Anderson, Tatham, & Black, 1998).

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Means, Standard Deviations, and Zero-Order Correlations Among Study Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>1. Class Standing</td>
<td>2.69</td>
</tr>
<tr>
<td>2. Work Experience</td>
<td>3.70</td>
</tr>
<tr>
<td>3. High School DECA Exp.</td>
<td>1.76</td>
</tr>
<tr>
<td>4. Collegiate DECA Exp.</td>
<td>1.71</td>
</tr>
<tr>
<td>5. Mentoring</td>
<td>4.16</td>
</tr>
<tr>
<td>6. PsyCap</td>
<td>3.91</td>
</tr>
<tr>
<td>7. Career Commitment</td>
<td>3.16</td>
</tr>
</tbody>
</table>

Note- * p < .05, ** p < .01 Two-Tailed Test. 
Note- Coefficient alpha values are placed along the diagonal in parentheses.

FACTOR ANALYSIS

Some of the correlations as seen in the zero-order correlation table indicated that a factor analysis was necessary (i.e., those higher than .30). A principal components factor analysis was performed using 36 items (16 items measuring PsyCap, eight items measuring career commitment, and 12 items measuring mentoring) comprising the three scales to investigate any obviously high correlations and ensure that they are in fact separate constructs. Results of the principal components factor analysis indicated three factors emerged, which suggested that three distinct constructs are present. In addition, loadings were scrutinized and only two items from the PsyCap scale cross-loaded. Subsequently, a factor analysis was performed on each scale independently.

Factor analysis results for the independent variable mentoring revealed a KMO of .925 (which is above the acceptable level of .70) and the Bartlett’s test of sphericity was significant ($\chi^2 (66) = 1654.63, p < .05$). Finally, the communalities were all above .3, further confirming that each item shared some common variance with other items. Lastly, one factor accounted for approximately 53% of the variance.
### Table 2
Factor Analysis Results for Mentoring

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
</tr>
<tr>
<td>1</td>
<td>6.387</td>
<td>53.227</td>
</tr>
<tr>
<td>2</td>
<td>.977</td>
<td>8.142</td>
</tr>
<tr>
<td>3</td>
<td>.812</td>
<td>6.766</td>
</tr>
<tr>
<td>4</td>
<td>.620</td>
<td>5.167</td>
</tr>
<tr>
<td>5</td>
<td>.591</td>
<td>4.924</td>
</tr>
<tr>
<td>6</td>
<td>.519</td>
<td>4.323</td>
</tr>
<tr>
<td>7</td>
<td>.453</td>
<td>3.774</td>
</tr>
<tr>
<td>8</td>
<td>.403</td>
<td>3.361</td>
</tr>
<tr>
<td>9</td>
<td>.362</td>
<td>3.013</td>
</tr>
<tr>
<td>10</td>
<td>.328</td>
<td>2.736</td>
</tr>
<tr>
<td>11</td>
<td>.318</td>
<td>2.650</td>
</tr>
<tr>
<td>12</td>
<td>.230</td>
<td>1.916</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.

The following factor analysis results for the independent variable PsyCap reveal three factor loadings (rather than four sub factors of hope, efficacy, resilience, and optimism that the scale purports to measure). However, the KMO (.950) and the Bartlett’s test of sphericity ($\chi^2$ (276) = 3867.50, $p < .05$) indicate whole scale reliability and validity (no hypotheses directly address sub factors). Finally, the communalities for each sub factor were all above .4, further confirming that each item shared some common variance with other items measuring the same sub factor. Lastly, three factors accounted for approximately 61% of the variance.

### Table 3
Factor Analysis Results for PsyCap

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
</tr>
<tr>
<td>1</td>
<td>11.264</td>
<td>46.932</td>
</tr>
<tr>
<td>2</td>
<td>2.121</td>
<td>8.837</td>
</tr>
<tr>
<td>3</td>
<td>1.314</td>
<td>5.474</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
Factor analysis results for the dependent variable career commitment revealed a KMO of .811 (which is above the acceptable level of .70) and the Bartlett’s test of sphericity was significant ($\chi^2 (6) = 445.17, p < .05$). Finally, the communalities were all above .5, further confirming that each item shared some common variance with other items. Lastly, one factor accounts for approximately 68% of the variance.

![Table 4](image)

**Table 4**

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
</tr>
<tr>
<td>1</td>
<td>2.735</td>
<td>68.380</td>
</tr>
<tr>
<td>2</td>
<td>.511</td>
<td>12.770</td>
</tr>
<tr>
<td>3</td>
<td>.445</td>
<td>11.129</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.

**Hypothesis Testing**

Hypothesis 1: PsyCap is positively related to students’ future career commitment.

Linear regression was performed and the following sequence was followed. Step 1 of the regression included entering all four control variables simultaneously (year of participation in Collegiate DECA, previous work experience, high school DECA experience, and current class standing). The $R^2$ value with control variables in equation one was .046. Next, step 2 in the regression involved the addition of the independent variable PsyCap. The $R^2$ value for the regression equation with the IV was .275, resulting in an $R^2$ change of .229, which was significant ($p = .000$), Therefore, hypothesis 1 is supported.

In Table 6, the beta for the IV is .376 ($p = .000$). One control variable (class standing) was also significant with a beta of $-0.051 (p = .039$); however, class was controlled for in model 2.

Hypothesis 2: Mentoring partially mediates the relationship between PsyCap and career commitment

Testing for hypothesis 2 followed the guidelines established by Baron and Kenny (1986) to examine mediating effects. Three regression equations were estimated by “first regressing the mediator on the independent variable; second, regressing the dependent variable on the independent variable; and third, regressing the dependent variable on both the independent variable and on the mediator” (p. 1177). Demographic control variables for the analysis included a) class standing, b) work experience, c) high school DECA experience, and d) Collegiate DECA experience.
### Table 5
Model Summary—Regressing Career Commitment on PsyCap

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.215 a</td>
<td>.046</td>
<td>.031</td>
<td>.39768</td>
<td>.046</td>
<td>2.931</td>
<td>4</td>
<td>241</td>
</tr>
<tr>
<td>2</td>
<td>.524 b</td>
<td>.275</td>
<td>.260</td>
<td>.34748</td>
<td>.229</td>
<td>75.670</td>
<td>1</td>
<td>240</td>
</tr>
</tbody>
</table>

| Models: (Constant),
| D-Q13: “What year of participation in Collegiate DECA is this for you?”
| D-Q11: “Please indicate the amount of work experience below”
| D-Q12: “Did you participate in DECA in high school?”
| D-Q8: “What is your current class standing?”

#### a. Predictors:
- D-Q13: “What year of participation in Collegiate DECA is this for you?”
- D-Q11: “Please indicate the amount of work experience below:
- D-Q12: “Did you participate in DECA in high school?”
- D-Q8: “What is your current class standing?”

### Table 6
Regression Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>3.772</td>
<td>.144</td>
<td>26.182</td>
</tr>
<tr>
<td></td>
<td>D-Q8: What is your current class standing?</td>
<td>−.051</td>
<td>.025</td>
<td>−.140</td>
</tr>
<tr>
<td></td>
<td>D-Q11: Please indicate the amount of work experience below:</td>
<td>.043</td>
<td>.022</td>
<td>.124</td>
</tr>
<tr>
<td></td>
<td>D-Q12: Did you participate in DECA in high school?</td>
<td>−.095</td>
<td>.060</td>
<td>−.101</td>
</tr>
<tr>
<td></td>
<td>D-Q13: What year of participation in Collegiate DECA is this for you?</td>
<td>.050</td>
<td>.028</td>
<td>.123</td>
</tr>
<tr>
<td>2</td>
<td>(Constant)</td>
<td>2.330</td>
<td>.208</td>
<td>11.190</td>
</tr>
<tr>
<td></td>
<td>D-Q8: What is your current class standing?</td>
<td>−.036</td>
<td>.022</td>
<td>−.099</td>
</tr>
<tr>
<td></td>
<td>D-Q11: Please indicate the amount of work experience below:</td>
<td>.021</td>
<td>.019</td>
<td>.063</td>
</tr>
<tr>
<td></td>
<td>D-Q12: Did you participate in DECA in high school?</td>
<td>−.067</td>
<td>.053</td>
<td>−.071</td>
</tr>
<tr>
<td></td>
<td>D-Q13: What year of participation in Collegiate DECA is this for you?</td>
<td>.030</td>
<td>.024</td>
<td>.073</td>
</tr>
<tr>
<td></td>
<td>PsyCapTotalVariables</td>
<td>.376</td>
<td>.043</td>
<td>.485</td>
</tr>
</tbody>
</table>

Dependent Variable: Career Commitment
Following Beer’s (n.d.) approach, which noted that a reduction between equation one and equation three’s betas, indicates partial mediation, Table 7 provides the mediation results for hypothesis 2. Since the (standardized) regression coefficient for mentoring was reduced by .042 (.376 – .334) at $p < .005$, a significant partial mediation was found.

<table>
<thead>
<tr>
<th>Table 7</th>
<th>Mediation Results for Hypothesis 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adj. $R^2$</td>
</tr>
<tr>
<td>1. Regressing mentoring on PsyCap</td>
<td>.628</td>
</tr>
<tr>
<td>2. Regressing career commitment on PsyCap</td>
<td>.260</td>
</tr>
<tr>
<td>3. Regressing career commitment on mentoring, controlling for PsyCap beta for PsyCap</td>
<td>.465</td>
</tr>
<tr>
<td>Difference between beta in equation 2 and equation 3</td>
<td></td>
</tr>
</tbody>
</table>

A bootstrap of the standardized coefficients showed that the beta coefficients for both PsyCap and mentoring were significant at $p < .01$. Additionally, the 95% confidence intervals show that the true indirect effect is likely to fall between 0.165 and 0.085. The indirect effect is significant and there is partial mediation in the model. This data, combined with the Baron and Kenny (1986) partial mediation test, confirms Hypothesis 2, suggesting that mentoring partially mediates the relationship between PsyCap and future career commitment.

**DISCUSSION AND CONCLUSIONS**

For this study, the extra-curricular organization of Collegiate DECA was the context used to investigate relationships between PsyCap, mentoring, and career commitment. The support for the first hypothesis suggests that in fact there is a significant direct relationship between students’ PsyCap and students’ career commitment.

Support for the second hypothesis suggests that mentoring partially mediates the relationship between students’ PsyCap and students’ career commitment; in other words, mentoring acts as the vehicle through which PsyCap affects student career commitment. This may be an indicator of the likelihood that students who experience mentoring may be more committed to their career, and thus more decisive about their career path.

**Limitations of the Research**

Limitations of the research include the risk of common method variance because all data points were drawn from the students’ own perceptions of their learning.
experiences. Another limitation is that the data were obtained from university students in attendance at Collegiate DECA International Competition, who may be better equipped to be informed and committed to their careers as opposed to students who were not in attendance. These students are already top students by qualifying in the state/regional level or top in their respective chapters to enter into international competition, which may have created a ceiling effect (Alreck & Settle, 1985).

**Future Research**

One recommendation for future research is to extend this study to include students who are not involved in an extra-curricular organization as well as students engaged in formal mentoring programs to determine whether differences in career commitment exist. A second recommendation would be to compare data using other variables and/or moderating factors that might influence a student’s perceived career commitment, such as affective occupational commitment or social identity with a particular referent group. A third recommendation might include a long-term study by following students throughout their careers to determine whether the mentoring received was in fact beneficial to their career commitment (measure stability in careers or satisfaction with career). Finally, a larger sample size might suggest increased generalizability to students who receive mentoring in other collegiate organizations (non-business related).

**Conclusions**

This research extended Pittaway et al.’s (2011) call by examining how mentoring in an extra-curricular organization is related to student career commitment, which can be construed as a valuable practical outcome for organizations to be aware of, as they may find value in hiring individuals who have a higher level of commitment to a particular career. Certainly we would all agree that it is concerning to all stakeholders that many college students today attend college and graduate expecting that a career will be waiting for them, when often, this is not the case, especially in today’s times of competitive employment (Larkin, LaPort, & Pines, 2007). It is also feasible to suggest that most of us would agree with Clark’s (2005) suggestion that these nontraditional approaches to higher education such as entrepreneurial organization(s) should be important to today’s educators and students to maximize the student’s ability to be the best hire with a keen idea of their commitment to a career.
REFERENCES


Website Design and Environmental Imagery: An Investigation Using Oil and Gas Firms

John A. Pendley
Barbara Woods McElroy
Susquehanna University

ABSTRACT
This paper reports on a critical analysis of the websites of energy companies that are heavily involved in hydrofracking oil and gas wells. The purpose of this research is to identify repeated images and symbols that are created by the purposeful manipulation of content on the websites of natural gas companies. By analyzing the web content in this way, we hope to gain insight into the messages that these companies intend for their relevant stakeholders. The websites of three natural gas drilling companies are examined. Universally, the companies created elaborate images and textual metaphors that stress the needs of investors in the companies’ securities and deflect attention away from the environmental risks inherent in the companies’ operations. However, despite the heavy investor emphasis of the firms’ web content, the analysis did indicate that important individual-firm differences do exist with respect to other stakeholder groups. In particular, some of the selected firms have designed specialized websites for specific stakeholder groups (e.g., landowners), which may suggest the possibility for enhancing the reporting to non-investor groups. Specialized reporting to specific stakeholder groups also indicates that large-sample generalizations that are common in empirically based social reporting research may be difficult to apply to specific environmental activities, such as natural gas drilling in the Marcellus shale.

Keywords: websites, environmental reporting, natural gas companies

Acknowledgements: The authors thank participants at the 2012 American Accounting Association Annual Meeting and the 2012 American Accounting Association Public Interest Section Midyear meeting for comments on previous versions of this paper.
INTRODUCTION

In this study, the underlying symbolism and imagery exhibited by the websites of three large publicly traded natural gas companies are described. Virtually all public companies maintain a general corporate website to describe the company and to communicate with stakeholders (Ashbaugh, Johnstone, & Warfield, 1999; Beattie & Pratt, 2003). In the critical accounting literature, it is known that many stakeholder interests are neglected in current reporting requirements (Young, 2006) and that companies carefully craft messages to target stakeholder groups pursuant to specific organizational goals (Deegan, 2002). We examined the web content that energy companies designate for stakeholders. We conducted this evaluation in the hopes of learning more about the intended audiences for content on environmental issues. Underlying themes and symbols should lead to a better understanding of which groups are targeted with environmentally related web content, and perhaps more importantly for critical perspectives researchers, which groups are ignored.

For the study, we examined and interpreted environmental content for energy companies that are drilling hydraulically fractured oil and gas wells in the Marcellus Shale region of Pennsylvania. Our interest arose because of the close proximity of Marcellus development to our schools and homes. However, hydraulic fracturing (i.e., fracking) is a technology that is deployed across the United States. Thus, even though much of our discussion arises from research on the Marcellus shale, the problems and issues apply to any major shale play.

Drilling in the Marcellus shale has polarized the community along environmental, economic, social, and political lines. The drilling activity invokes very emotional responses from a wide variety of stakeholder groups, running the spectrum from mixed and conflicting responses from a single individual to vehement and angry responses from normally staid and quiet community groups. Because the polemics, although strong, are not currently weighted toward one view versus others, there is considerable latitude in the approach that natural gas companies can take in communicating with the public. As a result of the varied contextual characteristics, a study of accounting disclosures made by firms involved in drilling activities may yield considerable insight into companies’ motivations to disclose environmental information, including the methods of legitimizing and reactions to specific stakeholder groups.

We concentrated on content included in company websites since the internet is often the principal method of communicating with stakeholders (Rowbottom & Lymer, 2009). Virtually all companies have a corporate website (Pendley & Rai, 2009) and utilize the site to deliver information and to address public relations goals (Bollen, Hassink, & Bozic, 2006). It is important, therefore, to examine websites since companies use them extensively to bolster their image, tailor messages to groups considered most important, and to shape the perception of the organization with the public at large. Of particular importance is the fact that
web-based disclosures are far less regulated than other types of disclosures such as audited financial statements. This lack of regulation means that companies disclose what, and to whom, they find most effective in addressing their goals. Therefore, similarity or variation in disclosures can be interpreted as intentional and meaningful.

Prior research has deconstructed annual reports (Preston, Wright, & Young, 1996; David, 2001), company websites (Craig, Garrott, & Amernic, 2001), and CEO letters (Amernic, Craig, & Tourish, 2010) in order to analyze the rhetoric that managers use to mold the public image of the corporation. A similar critical analysis was employed by this study. Concentrating on environmental content on company websites, we documented the structure (what pages exist and how they are linked) and the design (use of color, text, graphics, and hyperlinks) of the sites.

This study adds to the literature on environmental disclosure in several ways. First, an assessment was made of websites, a communication medium that has not received much attention in the prior accounting literature on environmental and social disclosure. Second, the use of qualitative measures allows us to evaluate a broader set of information. Third, we investigated the relationship between drilling companies and affected constituents (or “relevant publics;” Neu, Warsame, & Pedwell, 1998). Websites allowed us a lens to consider company motivations that are not directly observable. We investigated the role that environmental content and environmental imagery play in this relationship, thus advancing the knowledge of how business organizations respond to their relevant publics.

NATURAL GAS DRILLING IN THE MARCELLUS SHALE

The Marcellus shale formation is a vast area of sedimentary rock underlying portions of New York, Pennsylvania, West Virginia, and Ohio in the Eastern United States. These geologic formations contain significant amounts of natural gas. Early estimates ranged as high as 516 trillion cubic feet (Finkel, 2011) though more recently, estimates have been revised dramatically downward to 84 trillion cubic feet—around 20% the earlier estimate (Urbina, 2011; Goodell, 2012).

Prior to 2000, it was impossible to cost-effectively extract natural gas from these shale formations. Only with the innovations involving hydraulic fracturing (fracking) did it become economically feasible to tap these gas reserves. Fracking forces water and chemicals into the shale formations and fractures the surrounding stone. Doing so releases the trapped natural gas, which is collected and sent to the surface via the well bore. Since 2006, over 3,000 wells have been fracked in Pennsylvania bring both economic boon and a host of environmental headaches (Marcellus Shale Advisory Commission, 2011).
The environmental concerns surrounding fracking are large and looming. Drilling one well requires high-pressure injection of two to nine million gallons of water mixed with sand and various chemicals, some of which are toxic to animals and humans. In addition to the chemicals added by drilling companies, the “flowback” brings back from underground a variety of naturally existing contaminants, including bromide, methane, and radioactive elements. Natural gas companies maintain that the process is safe. Opponents of drilling disagree and point to documented cases of spills and contamination of streams and groundwater resources to show the inherent danger of fracking (Coman, 2012; Sierra Club, 2014).

Beyond concern for water use and contamination, there are other environmental and social concerns including: increased truck traffic, increased carbon emissions, damaged pristine wilderness, unacceptable noise levels, and general disruption of life in formerly quiet and safe rural communities.

In contrast to the environmental concerns are the numerous benefits to shale gas development. On a national level, the growth in natural gas production has brought the United States closer to “energy independence.” The Energy Information Administration states that technically recoverable shale gas reserves have the potential to satisfy domestic consumption for up to thirty years (Schmidt, 2011; Grottenthaler, 2011). From a financial perspective, hydraulic fracturing has re-invigorated domestic oil and gas production, improving the earnings of natural gas companies and making the companies’ securities more attractive to current and prospective investors. Finally, benefits accrue at the local level. Pennsylvania State University (PSU) estimates the economic benefits at over one trillion dollars and 140,000 jobs and projects that for every billion dollars in royalty income paid by gas companies, almost 8,000 new jobs will be created (Maher, 2011). The net result is that jobs have increased in a relatively impoverished region, not only in areas directly related to drilling but also through spillover benefits such as increased demand for professional services and increased revenues in restaurants, hotels, and retail establishments.

The contrast of health and environmental costs with economic benefits makes drilling in the Marcellus shale an extremely polarizing event. How natural gas firms that operate in this area respond to stakeholders is the central question addressed in this research.

DEFINING THE STAKEHOLDERS IN THE MARCELLUS SHALE CONFLICT

Based on the above discussion, the primary stakeholders that are affected by Marcellus drilling are (in no particular order): 1) Current and potential investors, 2) land owners, 3) residents and communities near drilling sites, 4) current and potential employees, 5) environmentalists, and 6) regulators and policy makers. Others groups are affected (hunters and fishermen, for example); however, we...
consider the six groups identified above as having the most significant interest in drilling issues.

**METHODOLOGICAL APPROACH**

Our purpose in the paper is to contribute to the understanding of environmental disclosures by closely examining the corporate websites of a small group of Marcellus Shale drillers. We collected data on the websites’ structure and design, and commented on the thematic elements underlying the sites’ design.

We examined the websites of three large natural gas companies that have widespread operations in the State of Pennsylvania. We identified these companies from a list provided by the Pennsylvania Department of Environmental Protection (2011) of organizations that have drilling permits to explore and extract natural gas from the shale formations within the state. This list identified a total of 82 organizations holding or having applied for 8,513 permits. We selected the top three permit holders. These three organizations held 3,101 permits (or 36.4% of the total). Drilling operations are often conducted through subsidiaries or joint ventures. Since permits are issued to these subsidiary organizations, we searched news stories and business reports on the internet to identify parent companies. For the three cases selected, the permit-holding organizations were wholly owned subsidiaries of their respective parent companies. Pertinent introductory data about the three firms is provided in Table 1.

<table>
<thead>
<tr>
<th>Permit Holder</th>
<th>Number of Permits</th>
<th>Parent Company</th>
<th>Company Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chesapeake Appalachia LLC</td>
<td>1484</td>
<td>Chesapeake Energy Corporation</td>
<td><a href="http://www.chk.com">www.chk.com</a></td>
</tr>
<tr>
<td>Range Resources Appalachia</td>
<td>821</td>
<td>Range Resources Corporation</td>
<td><a href="http://www.rangeresources.com">www.rangeresources.com</a></td>
</tr>
<tr>
<td>Talisman Energy USA Inc.</td>
<td>796</td>
<td>Talisman Energy Inc.</td>
<td><a href="http://www.talisman-energy.com">www.talisman-energy.com</a></td>
</tr>
</tbody>
</table>

For these firms, we conducted a close examination of their websites. First, the structure and organization of the websites were documented. Starting at the home page and navigating to all areas of the site, we documented the overall appearance and structure of the site, including the relationship of the pages (how pages are linked) and identified the relevant financial and environmental content that exists on those pages. For the three companies, we noted differences in the way that the sites are constructed and the methods that these three companies have chosen to communicate to users.
Data gathering for the project was completed in the final months of 2011. Preliminary work was conducted in September and October; the structural study and analysis was performed in November and December of that year.

These sites were evaluated on two dimensions. First, we examined content placement and information accessibility. The degree that information can be found is an important design element and web designers have considerable control over accessibility (Faraday, 2000). The second dimension used to evaluate the site is thematic—we examined various content elements to uncover imagery and metaphors inherent in the site’s design. Since these three companies are similar (based on size and industry), we found them embracing very similar themes in their websites. There were, however, notable differences that are discussed below.

**CONTENT PLACEMENT AND ACCESSIBILITY**

All three company websites contained a section for investors. These pages contained financial statements, regulatory filings, press releases, stock price and exchange data, and stockholder FAQs. Structure of these pages was very uniform, and was consistent with investor relation web pages for most public corporations (Heinze & Hu, 2006; Pendley & Rai, 2009). Consistent with other companies, the three sample company sites were heavily oriented toward investors (Rowbottom & Lymer, 2009). Considerable amounts of traditional quantitative financial information were provided in this section of the website.

Given the industrial nature of the companies’ business, many pages were devoted to operations—how natural gas is located, extracted, and processed. These pages commonly showed technical aspects of the drilling process. Drawings of the fracking process were provided by Chesapeake and Talisman. Range’s site contained a time-lapse video of a drilling rig being set up. Chesapeake heavily integrated operational aspects into a complex set of pages on corporate strategy. Safety was mentioned frequently but only in a general and non-specific manner (e.g., “The company believes … ”).

A set of pages for “the community” appeared on all three websites. The U.S. companies, Chesapeake and Range, treated these pages as advertisements for their philanthropic activities. In a manner different from their U.S. competitors, Talisman, based in Canada, published considerable rhetoric on aboriginal relations. Neu, Warsame, and Pedwell (1998) note also the importance of aboriginal communities to companies operating in environmentally sensitive areas of Canada.

On all three sites, the content was well organized, professionally designed, and virtually mistake-free; however, the firms did use the diversity and complexity of web media in different ways and for different effects:
Chesapeake utilized a relatively straightforward, direct, and business-like approach, concentrating on the technical aspects of the drilling process, and the integration of operations with other aspects of the business.

Range employed a much more emotional, interpersonal approach showing lots of common, everyday people in their natural settings. Range quoted or recorded these individuals talking about their lives and how they are (positively) affected by Range.

Talisman had the greatest amount of content. Some of this content was purposely duplicated and hyperlinked repeatedly. The intent, it appears, was transparency—to show the willingness of the company to share information with outsiders. Interestingly, Talisman avoided overly technical content (as is the case with Chesapeake) and avoided emotional and interpersonal content (as in Range’s site).

We noted that two of the companies (Chesapeake and Range) have deployed separate websites for specific stakeholder audiences. These sites were linked to both Range’s and Chesapeake’s main corporate site. These sites are important since, as discussed below, the deployment of a specialized, stakeholder-specific site could deliver more relevant information to that stakeholder group.

THEMES AND METAPHORS

Thematically, it is clear that the predominant audience for the three websites is investors. All three sites prominently showed stock information (ticker symbol, share price, frequency of update) in the upper right portion of the home page. The main hyperlink menu on the company home page emphasized the importance of the investor: Range had the link for “investor relations” third in a main horizontal menu, after “our company” and “operations;” Chesapeake had their “investors” link first, and Talisman, like Range, provided the “investor relations” link third after “about us” and “operations.” Words such as “value,” “growth,” and “opportunities” support the classical shareholder orientation. This phraseology permeated all sections of the site.

Additional site design features suggest a strong secondary theme of cleanliness, purity, and environmental serenity. The color scheme of all three sites was blue/green. The color palette suggests the outdoors: clean air, green grass, and clear blue skies. Range, for example, created a home page with a background of a soft blue sky fringed lightly with fluffy white clouds. Placed on this background is a series of rotating images depicting picturesque hills, sculptured and verdant fields, and rustic farm scenes. Notable for their absence in the rotation were photos of drilling rigs or wells. On the Chesapeake home page, a banner with green and blue chevrons superimposed on forest scenes is placed on a simple white background. Talisman relied the least on photographed landscapes,
relying instead on pictures of clean and smiling employees. Talisman does, as the other companies do, use a blue and green color motif. David (2001) notes that associating beauty with commerce or industry is a common metaphorical approach. Embedding these images in the site and repeating them, as is common in rotating banner images, attempts to link nature’s beauty with a production process that is, in truth, dirty and dangerous.

The metaphor of natural beauty continued deeper into the sites. For example, all three companies showed various long focus photographs of drilling rigs, set in pristine settings, seemingly dropped in from the sky without upsetting the ecosystem of the surrounding forest. In the career section, Chesapeake had photographs of “beautiful corporate campus,” a gleaming office building with manicured lawns, trees, and flower beds in bloom.

In summary, the environmental content that appeared on the subject sites is intended to legitimize the companies’ operations for those close to or already associated with the company. David (2001) states that these individuals understand that the company engages in risky and dangerous activities. They prefer, however, not to be reminded of the fact. Thus, the environmental content serves little other purpose than to make stockholders and employees groups feel better about being associated with these companies. There is little or no attempt to communicate with stakeholders other than stockholders and employees.

SYNTHESIS AND DISCUSSION

A comparison of the three companies’ web reporting strategies and the metaphorical emphases that support the strategy are shown in Table 2.

<table>
<thead>
<tr>
<th>Website</th>
<th>Primary Emphasis</th>
<th>Secondary Emphasis</th>
<th>Other Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chesapeake</td>
<td>Financial returns</td>
<td>Nature and beauty</td>
<td>Bifurcated websites (sites for specialized stakeholder communication)</td>
</tr>
<tr>
<td>Range</td>
<td>Financial returns</td>
<td>Nature and beauty</td>
<td>Bifurcated websites (sites for specialized stakeholder communication)</td>
</tr>
<tr>
<td>Talisman</td>
<td>Financial returns</td>
<td>Aboriginal relationships</td>
<td>Regulatory compliance</td>
</tr>
</tbody>
</table>

The three companies employed their websites to support traditional shareholder communication that is rich in classical economic allusions and imagery (i.e.,
profits, growth, returns, value creation, costs, and so on). This is consistent with the first commercial use of the internet—companies create websites to talk about shareholder returns and to deliver regulatory reports and financial statements (Ashbaugh, Johnstone, & Warfield, 1999). Secondarily, the two U.S. based companies, Chesapeake and Range, employed idealized images of natural and pastoral beauty, consistent with past observations of use of photographic images in corporate annual reports (Preston, Wright, & Young, 1996; David, 2001). Further, the nature and beauty theme appeared cued to rural scenes in the areas where Marcellus drilling occurs. As a secondary emphasis, Talisman, a Canadian company, showed photographic images of indigenous peoples in Canada and Peru (but not rural Pennsylvania) to foster a belief in equitable treatment of aboriginal interests. Significant rhetoric about aboriginal relations is a finding that is not inconsistent with other studies of Canadian firms (Neu, Warsame, & Pedwell, 1998).

These findings support and extend the critical and environmental reporting literature several ways. We offer the following points of synthesis:

1. The content on the sites we examined are designed for two audiences: shareholders and employees (and prospective employees). Rowbottom and Lymer (2009) find that these two groups are, in fact, the most frequent users of corporate sites; thus, it is reasonable that the sites we examined stress these two relevant publics. Landowners may be accommodated with specialized sites (see point 3 below). Environmental and community groups received scant attention from the companies.

2. The natural gas companies in our sample did not engage in legitimizing behavior with the groups that most oppose their operation in the Marcellus Shale region. There is no attempt at reasoned discussion to address the issues brought about by key environmental groups. The company websites that we examined cited no scientific research on effects of fracking on the environment. It may be as David (2001) suggests that separate industry associations engage in specific and purposive image building that effectively buffers its member from contentious and damaging situations. A key industry group, The Marcellus Shale Coalition (marcelluscoalition.org), fits this description. By funding an industry coalition to address the most vehement controversies, companies can engage in legitimizing discourse with stakeholders/employees who have favorable inclinations toward the company but may have mixed feelings or mild doubts. In substance, companies would ignore environmentalists and target company discourse for those groups for whom legitimacy would have the greatest effect. This appeared to be the case for our Marcellus Shale sample. If this practice were widespread, it could explain the finding of Cho and Patten (2007) who found no difference in non-monetary environmental disclosures between good versus bad performers in environmentally sensitive industries. Our observations suggested that this might occur if all firms in an industry
(both good and bad performers) engage in metaphorical platitudes in equal measure, and collectively fund an industry group to protect all firms (good and bad) from the firms’ most damaging critics.

3. We documented in this paper that two of the sample companies (Chesapeake and Range) are using separate websites to address specific stakeholder interests. Legitimization appears, based on the brief examination, to be the motivation behind much of the content on these sites. Despite this possibility, custom sites in theory hold considerable promise. Although these specialized sites are manifested in a different manner, they do conform, in a general way, to early thinking about how the internet could substantively improve the financial reporting process (Financial Accounting Standards Board, 2000; Lymer & Debreceny, 2003; Unerman & Bennett, 2004). Early studies in internet financial reporting described how a digitized environment powered by the internet would allow reporting firms to deliver tailored information without waiting for it to be produced through the traditional channels (Ettredge, Richardson, & Scholz, 2001; Lymer & Debreceny, 2003). Some researchers suggested that more qualitative and forward-looking disclosures were technologically possible (Xiao, Jones, & Lymer, 2002; Beattie & Pratt, 2003). Despite that legitimizing behavior appears to be the motivation behind current specialized sites, the fact that Chesapeake and Range have created them is an interesting trend. Future research should address the contents, structure, and embedded themes in these sites, as well as the relationship of the specialized structures to the corporate site.

CONCLUSION

This study involved the assessment of corporate environmental communication in their websites on a small sample of energy companies engaged in controversial drilling practices. The small sample sizes allowed a close examination of how environmental issues are portrayed in web-based business reporting. The controversial practice that forms the environmental context of the study is hydraulic fracturing (fracking). On one side of the debate are environmentalists who vehemently denounce fracking as an irresponsible activity that will critically damage environmental resources. On the other side are industry officials, local politicians, and many citizens in the region that strongly support drilling activities due to an increase in jobs and other economic benefits. Though each side recognizes that the region is relatively impoverished, they disagree on whether the benefits (jobs and other economic benefits to a limited number of residents) outweigh the costs (environmental degradation, destruction of wildlife, and potential chemical pollution).

We found that environmental disclosure has a surprising inward orientation—that the content serves to legitimize the organization’s values for investors and employees, but not citizens affected by drilling activity or environmental groups.
Thus, the individuals most likely to view the content are close to the organization but not directly impacted by the pollution-creating activities. Our analysis suggests that the main purpose of environmental content is to shield investors and employees from the unpleasant realities of the companies’ production processes while creating an image of the organization as a clean and wholesome organization doing nothing but good things for local citizens and the country as a whole.

We did note that there is a positive trend toward creating specialized websites for specific stakeholders, in this case landowners. This creates the possibility that companies can address equitability and transparency within these specific sites. Whether this occurs or not must be the subject of future research.
REFERENCES


Ahren Johnston
Missouri State University

ABSTRACT
This study examines trends in inventory efficiency of wholesalers as measured by inventory turnover. The primary research question is whether inventory efficiency has increased concurrently with the increased focus of management on logistics and supply chain management that began in the late 1970s and early 1980s. Using 30 years of panel data from publicly traded retailers and a fixed effects econometric model, this research reveals that most increases in inventory turnover can be explained by the presence of economies of scale and/or scope that have been exploited by an increase in average firm size.

Keywords: inventory turnover, wholesale, logistics

INTRODUCTION
One of the key focuses of both logistics and supply chain management is inventory management, and an examination of the Council of Supply Chain Management Professionals’ (CSCMP) most recent State of Logistics report reveals a compelling reason for this. Nearly one third of total logistics costs in the United States are attributable to inventory carrying costs, and close to two thirds are attributable to transportation costs (CSCMP, 2013). Therefore, any firm attempting to minimize total logistics costs should focus on managing the trade-offs between these two cost categories. The purpose of this study is to explore the net impact to wholesalers’ inventory levels and efficiency resulting from changes to managerial decisions over the past 30 years related to logistics and supply chain management. A key gap in the literature that will be filled by this study is that studies exploring temporal trends in inventory efficiency have not controlled for firm size. This should be of interests to managers because if previously identified improvements in inventory efficiency are the result of
economies of scale and/or scope rather than overt managerial action, there may well exist additional opportunities for improved inventory efficiency.

As U.S. firms began focusing on logistics management in the late 1970s and early 1980s, two of the key tradeoffs analyzed by firms were managed by adjusting the speed and reliability of transportation and adjusting order quantities. As the speed and reliability of transportation is increased, transportation costs generally increase because the carrier generally needs to hire additional drivers and/or purchase more equipment to achieve faster, more reliable service, but for a given customer service level, inventory levels and thus carrying costs could decrease due to a reduction in average inventory levels. Additionally, as the order quantity is increased, annual inventory carrying costs increase with a higher average inventory level, and annual ordering costs decrease as fewer orders need to be placed throughout the year. As a result of these tradeoff analyses, many firms found their total costs could be decreased by switching from rail carriers to motor carriers, who on average are more expensive per ton-mile but are also faster and more reliable (Coyle, Novack, Gibson, & Bardi, 2011, p. 345). Such a change would lead to an increase in transportation expenditures but would reduce average inventory levels and, subsequently, inventory carrying costs. Furthermore, with the increased use of Electronic Data Interchange (EDI), ordering costs have been significantly reduced (Lee, Padmanabhan, & Whang, 1997), enabling firms to reduce their order quantities, average inventory level, and inventory carrying costs.

Other changes of the past 30 years that likely reduced firms’ inventory levels and inventory levels throughout supply chains are the increased use of Enterprise Resource Planning (ERP) systems to more accurately track inventory levels and improved forecasting techniques including the increased use of Point of Sale (POS) data, Vendor Managed Inventory (VMI), and Collaborative Purchasing, Forecasting and Replenishment (CPFR). While the aforementioned changes likely led to decreased inventory levels on individual items, there has been a trend of increased product proliferation, which would tend to increase a firm’s overall inventory levels. Additionally, lengthening supply chains with long lead times and greater variability have led to increased inventory levels.

One of the most commonly used measures of the efficiency of a firm’s inventory management is inventory turnover (IT), measured as the ratio of Cost of Goods Sold (COGS) to average inventory value and is typically reported as an annual measure. For a given level of demand and the corresponding COGS, reductions in inventory levels would lead to an increase in inventory turnover, so a higher value indicates greater inventory efficiency.

Looking at average levels of inventory turnover for publicly traded wholesalers over the last 30 years, as shown in Figure 1, reveals that average wholesaler inventory turnover has been increasing over time. However, this trend does not control for differences between individual wholesalers and other factors that
impact inventory turnover. The analysis presented in this paper will control for these differences in order to reveal the average of the net impact to each wholesaler’s inventory turnover over time. Additionally, a goal of this analysis is to verify previously published results as to the relationship between inventory turnover and a variety of control variables (Gaur, Fisher, & Raman, 1999, 2005; Rumyantsev & Netessine, 2007; Gaur & Kesavan, 2009).

![Figure 1](image.png)

Source: Standard and Poor’s Compustat North America

**LITERATURE REVIEW**

While not a major focus of empirical research, there is a modest body of literature related to wholesale inventory performance, a few papers that focus on retail inventory performance over time, and some papers that mention inventory performance incidentally while focusing their research elsewhere. This section provides a brief overview of much of the existing research of relevance.

Gaur et al. (1999) wrote a working paper exploring retail performance in terms of long run stock return. From one of their models comes an investigation into the relationship between gross margin and return on equity. The authors hypothesize that “firms with high gross margin have low inventory turns and vice versa” (Gaur et al., 1999, p. 12). Results of their analysis confirmed an inverse logarithmic relationship between the two measures and show that 64% of the variation in inventory turnover can be explained by gross margin. These results motivate the inclusion of gross margin in later studies seeking to explain inventory turnover.

Rajagopalan and Malhotra (2001) researched whether raw materials, work in process, and finished goods inventories decreased between 1961 and 1994 and whether they have decreased more significantly since 1980 when management began focusing heavily on just in time and inventory reduction. Results of their
analysis showed that raw materials and work in process inventories decreased in most industry sectors between 1961 and 1994 and more rapidly between 1980 and 1994. However, finished goods inventories decreased in some sectors, increased in others, and showed no significant trends in over half of the industry sectors examined.

Chen, Frank, and Wu (2005) performed an analysis of manufacturers’ inventories similar to Rajagopalan and Malhotra’s (2001) using a different level of detail and time period (1981–2000) and found consistent results. They found that raw material and work in process inventories declined significantly and finished goods inventories remained steady. Chen et al. (2005) also found that poor long-term stock returns are associated with both abnormally high and low inventories.

Gaur et al. (2005) investigated the correlation between retailers’ inventory turnover and gross margin, capital intensity, and sales surprise (sales divided by forecast) in a time series study spanning 1985–2000. In addition to confirming an inverse logarithmic relationship between gross margin and inventory turnover, Gaur et al. (2005) found that both capital intensity and sales surprise have a logarithmic relationship with inventory turnover. Furthermore, by using time specific dummy variables, they found that inventory turnover has been decreasing over time. While their study focused on retailers, it motivated the inclusion of both gross margin and capital intensity as control variables in this study.

Rumyantsev and Netessine (2007) examined inventory levels for a variety of manufacturers, wholesalers, and retailers between 1992 and 2002. Their results confirmed that firms with higher gross margins had lower inventories and, as suggested by inventory theory, firms with more uncertain demands and longer lead times had larger inventories. They further found evidence for economies of scale in that larger firms have relatively less inventory than smaller firms. These results motivated Gaur and Kesavan (2009) to include firm size, measured as annual sales, as an explanatory variable in their model investigating inventory turnover. Using retailer data from 1985–2003, Gaur and Kesavan (2009) confirmed the results of Gaur et al. (2005) and found evidence for diminishing returns to scale.

Chen, Frank, and Wu (2007) investigated inventory performance of retailers and wholesalers for a time period of 1981–2004 and found that while manufactures and wholesalers had seen improvements in inventory performance, retailers experienced no change in their inventory turnover until approximately 1995. The current study extends the work of Chen et al. (2007), using a slightly longer time span of 1981–2012, to see if the increasing trend of wholesalers’ inventory performance found by Chen et al. (2007) is impacted by controlling for firm size in the estimated model and if the increasing trend has continued in more recent years.
HYPOTHESIS DEVELOPMENT

This section explains the hypotheses that relate wholesalers’ inventory turnover to their gross margin, capital intensity, growth index, and firm size. It is important to note that the model focuses on year to year changes within each firm rather than across firms, which may be associated with additional factors such as accounting policy and management styles. In the analysis that follows, the firm effects are removed from the model using the within transformation or looking at each firm’s distance from its average values of each variable. This transformation removes any unexplained differences between firms based on other factors such as management style from the analysis and allows for more efficient estimation.

Hypothesis 1: Inventory turnover is negatively correlated with gross margin.

Gaur et al. (2005) do an admirable job of explaining the rationale behind Hypothesis 1. While their study was based on retailers, the same logic applies to wholesalers who utilize a similar business model of buying large quantities at a low price and selling smaller quantities at a higher price. They first note that, based on surveys of retailing firms, managers frequently tradeoff inventory turns and gross margin in their decision making as evidenced by the use of gross margin return on inventory (GMROI) to set business targets. Gaur et al. (2005) go on to explain this hypothesis based on results of academic literature. First, the classical newsboy model states that an increase in gross margin implies an increase in average inventory level, which would lead to a decrease in inventory turnover. Second, an increase in price should lead to an increase in gross margin but a decrease in quantity demanded and an increase in the variation of quantity demanded. This increased variation of demand should lead to increased safety stock levels and thus decreased inventory turnover. Thirdly, according to academic literature (e.g., Chamberlin, 1950), increases in product variety should lead to increased consumer utility, implying increased prices (Kotler, 1986; Nagle, 1987), and gross margins. However, based on the theory of risk pooling, this increase in variety also implies increased safety stock levels that should lead to increased inventory levels and decreased inventory turnover. Finally, a shorter product life cycle implies rapid changes to products to match consumer requirements and provide additional utility (Pashigian, 1988). This should also increase prices and gross margin, but the difficulty in forecasting product requirements with little historical demand should also lead to increases in safety stock and thus decreases in inventory turnover (Gaur et al., 2005). Therefore, from a variety of perspectives, it becomes clear that a tradeoff exists between gross margin and inventory turnover.

Hypothesis 2: Higher capital intensity increases inventory turnover.

Gaur et al. (2005) hypothesize that higher capital intensity increases inventory turnover based on the facts that investments in information technology...
should enable more efficient inventory management, investments in logistics management systems should also enable more efficient inventory management, and investment in distribution centers should lead to reduced inventory investment due to risk pooling. A corollary with wholesalers is that increased investments in existing distribution centers should reduce inventory investment due to risk pooling, while increased investments in additional distribution centers should lead to increased inventory investment relative to the cost of goods sold or a decrease in inventory turnover. It is not possible to differentiate between the various types of property, plant, and equipment investments due to limitations of the data set used in this study, but it will be possible to test the net impact on inventory turnover of changes to capital intensity.

Hypothesis 3: Inventory turnover is positively correlated with a firm’s growth.

If the sales of a wholesaler in a given period are higher than in the previous period, it is likely that they will also be higher than forecast levels. If this is the case, then average inventory level in that period will be lower than expected, leading to an increase in inventory turnover. Conversely, if sales of a wholesaler in a given period are lower than in the previous period, it is likely that they will also be lower than forecast levels. In this case, the inventory level in that period will be higher than expected leading to a decrease in inventory turnover. While this logic holds for some of the commonly used averaging forecasting techniques, such as exponential smoothing, with more weight given to more recent sales, it would not hold if wholesalers tend to use a more optimistic forecasting technique, and Hypothesis 3 would be rejected.

Hypothesis 4: Inventory turnover is positively correlated with firm size as measured by sales.

Following the logic of Gaur and Kesavan (2009), increases in firm size could lead to increases in both economies of scale and economies of scope, allowing for more efficient inventory management and increased inventory turnover. While they provide counter-arguments for this reasoning (e.g., a firm without excess capacity in its supply chain may not realize increase in economy of scale or scope with an expansion), the results of their analysis support a positive correlation between firm size and inventory turnover. Due to the rapid increase in average sales of publicly traded U.S. wholesalers after adjusting for inflation beginning after 1997, as shown in Figure 2, it is likely that any increases in inventory turnover over time can be attributed to the aforementioned increases in economies of scale and scope associated with the increase in average firm size.
Hypothesis 5: Inventory turnover has been increasing over time.

Chen et al. (2007) found that wholesaler inventory performance has been improving over time, and Figure 1 shows that average inventory turnover of publicly traded U.S. wholesalers has been increasing over time. Based on this evidence, it is hypothesized that, even after controlling for gross margin, capital intensity, and annual growth, inventory turnover has been increasing over the past 30 years. However, average firm size has also been expanding rapidly as shown in Figure 2. This rapid expansion could be associated with an increase in efficiency realized through the exploitation of economies of scale and scope leading to decreased inventory levels. Therefore, after controlling for firm size, in addition to gross margin, capital intensity, and annual growth, the trend of increasing inventory performance may be mitigated.

DATA

The majority of the data for this study was obtained from Standard and Poor's Compustat North America (2013). Data from annual income statements and quarterly balance sheets for publicly traded U.S. wholesale establishments (identified through Standard Industrial Classification (SIC) codes 5000–5190) were obtained over a time period from 1980 through 2012. Specific data obtained from the annual income statements included total revenue and gross income. Specific data obtained from the annual balance sheets included net fixed assets, inventory, and total assets. The only additional data used in this study was the implicit price deflator (IPD) obtained from the Federal Reserve Bank of St. Louis (2013). All of the measures employed as independent and dependent variables in the models were then calculated using this data.

The dependent variable used in all models of this study was inventory turnover. This is a commonly used measure of inventory efficiency; the natural logarithms
of other measures of inventory efficiency such as days of inventory and inventory to sales ratio are highly correlated with the natural logarithm of inventory turnover. Because the natural logarithm transformation will be employed in the analysis, using any of these alternate measures of inventory efficiency as dependent variables would yield much the same results as using inventory turnover. Because of these correlations and the fact that inventory turnover is a more widely used measure of inventory efficiency, inventory turnover will be used as the dependent variable. Furthermore, inventory turnover indicates the speed with which inventory moves through a network, and a higher number indicates less revenue relative to sales or greater efficiency. This leads to a more straightforward interpretation of the results of the study relative to inventory efficiency than less common, alternative measures.

Independent variables used by Gaur et al. (2005) and shown to impact inventory turnover will include gross margin and capital intensity index (as defined by Stickney & McGee, 1983). Gaur and Kesavan (2009) suggested using sales as a measure of firm size and growth index rather than sales surprise index as used by Gaur et al. (2005) because the two measures are highly correlated and growth index is easier to calculate. Therefore, sales adjusted for inflation and growth index will be used as additional independent control variables in this study.

In order to explain the calculations of the variables used in the analysis, let $COGS_i$ be the cost of goods sold by firm $i$ in year $t$, $I_i$ be defined as the inventory investment of firm $i$ in year $t$, $S_i$ be defined as the sales of firm $i$ in time period $t$, $PPE_i$ be the net property plant and equipment of firm $i$ in year $t$, $TA_i$ be the total assets of firm $i$ in year $t$, and $IPD$ be the implicit price deflator in time period $t$ obtained from the Federal Reserve Bank of St. Louis (2013), where $IPD_{2009} = 1$. With the exception of the implicit price deflator, these data were obtained from Standard and Poor's Compustat North America (2013). Given these definitions, the dependent and independent variables used in the various models can be defined as follows:

- **Inventory Turnover:** $IT = \frac{COGS}{(I_0 + I_1)/2}$
- **Gross Margin:** $GM = \frac{(S - COGS)}{S}$
- **Capital Intensity:** $CI = \frac{PPE}{TA}$
- **Growth Index:** $GI = \frac{S_t}{S_{t-1}}$
- **Adjusted Sales:** $AS = \frac{S}{(IPD/100)}$

Inventory turnover is calculated based on average annual inventory levels to account for changes in inventory levels throughout each year. The growth index captures increases or decreases in sales volume from year to year, but unlike sales
growth in dollars, this index can never take on a negative value for positive sales, allowing for the calculation of the natural logarithm for each observation. Finally, sales are adjusted for inflation using the implicit price deflator to exclude the impact of inflation from the analysis.

Table 1 lists the number of observations and average value and standard deviation of each of the independent and dependent variables for select years throughout the sample period and for the entire sample. As can be seen from Table 1, there is a significant variance within each variable. The initial data set contained observations from 1980–2012. The final data set consisted of 2,749 observations on a total of 145 firms between 1981 and 2012 after removing the first annual observation of each firm, when growth index could not be calculated, removing observations for any firms with less than five observations, and removing outliers. Of course as new firms entered the market through IPOs and firms exited the market through bankruptcies, mergers, and privatization, the number of firms sampled each year varied from only 39 in 1981 to a maximum of 135 in 2008.

<table>
<thead>
<tr>
<th>Year</th>
<th># obs</th>
<th>$\mu_{IT}$ ((\sigma_{IT}))</th>
<th>$\mu_{GM}$ ((\sigma_{GM}))</th>
<th>$\mu_{CI}$ ((\sigma_{CI}))</th>
<th>$\mu_{GI}$ ((\sigma_{GI}))</th>
<th>$\mu_{AS}$ ((\sigma_{AS}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982</td>
<td>40</td>
<td>6.20 (5.94)</td>
<td>0.24 (0.14)</td>
<td>0.27 (0.17)</td>
<td>1.01 (0.20)</td>
<td>2.01 (4.76)</td>
</tr>
<tr>
<td>1987</td>
<td>50</td>
<td>7.25 (9.45)</td>
<td>0.26 (0.16)</td>
<td>0.23 (0.17)</td>
<td>1.20 (0.53)</td>
<td>1.90 (3.94)</td>
</tr>
<tr>
<td>1992</td>
<td>54</td>
<td>11.28 (31.13)</td>
<td>0.23 (0.15)</td>
<td>0.20 (0.15)</td>
<td>1.16 (0.52)</td>
<td>2.03 (3.27)</td>
</tr>
<tr>
<td>1997</td>
<td>94</td>
<td>20.61 (59.72)</td>
<td>0.22 (0.15)</td>
<td>0.16 (0.14)</td>
<td>1.25 (0.48)</td>
<td>2.27 (4.00)</td>
</tr>
<tr>
<td>2002</td>
<td>118</td>
<td>15.63 (39.07)</td>
<td>0.24 (0.18)</td>
<td>0.18 (0.17)</td>
<td>1.06 (0.39)</td>
<td>3.58 (9.80)</td>
</tr>
<tr>
<td>2007</td>
<td>133</td>
<td>16.04 (29.93)</td>
<td>0.23 (0.18)</td>
<td>0.14 (0.14)</td>
<td>1.17 (0.62)</td>
<td>5.08 (13.70)</td>
</tr>
<tr>
<td>2012</td>
<td>121</td>
<td>13.36 (22.37)</td>
<td>0.22 (0.16)</td>
<td>0.15 (0.14)</td>
<td>1.05 (0.17)</td>
<td>6.87 (16.94)</td>
</tr>
<tr>
<td>Total</td>
<td>2,759</td>
<td>14.62 (34.79)</td>
<td>0.23 (0.16)</td>
<td>0.17 (0.15)</td>
<td>1.18 (1.21)</td>
<td>3.75 (10.46)</td>
</tr>
</tbody>
</table>

IT = Inventory Turnover, GM = Gross Margin, CI = Capital Intensity, GI = Growth Index, and AS = Sales Adjusted for Inflation

*Listed in Billions of 2009 Dollars
MODEL DEVELOPMENT

Upon calculation of all the dependent and independent variables for each firm and each year, the natural logarithm of each observation was calculated. The reasoning behind this transformation is that many of the relationships between independent variables and inventory turnover were curvilinear, and the log transformation allows for easier interpretation of the results because each estimated coefficient will reveal the elasticity or percent increase in inventory turnover associated with a 1% increase in the associated independent variable. For the time specific dummy variables, each estimated coefficient can be interpreted as the percent increase in turnover from 1981 after accounting for the independent variables, and when using year as an independent variable, the estimated coefficient can be interpreted as the average annual percentage increase in inventory turnover.

Additionally for each variable, each firm’s average value over time was subtracted from each observation. This “within transformation” removes individual firm effects from the data and allows for the examination of only the variation in inventory turnover over time. The following equations detail how this transformation was carried out on each variable: 

\[ IT^\prime = \ln(\text{IT}) - \ln(\text{IT}_{\text{avg}}); \quad GM^\prime = \ln(GM) - \ln(GM_{\text{avg}}); \quad CI^\prime = \ln(CI) - \ln(CI_{\text{avg}}); \quad GI^\prime = \ln(GI) - \ln(GI_{\text{avg}}); \quad AS^\prime = \ln(AS) - \ln(AS_{\text{avg}}); \quad Y^\prime = Y - Y_{\text{avg}}; \]

\( C = C_{\text{avg}}; \) and \( F = F_{\text{avg}} + C_{\text{avg}} \). In these equations, \( F_{\text{avg}} \) is the firm specific dummy variable removed by the transformation, \( C_{\text{avg}} \) are year specific dummy variables, and \( Y_{\text{avg}} \) is year.

The general model estimated is \( IT = f(F, C, GM, CI, GI, AS, Y) \), where \( IT \) is inventory turnover, \( F \) is matrix of firm specific dummy variables, \( C \) is a matrix of year specific dummy variables, \( GM \) is gross margin, \( CI \) is capital intensity, \( GI \) is growth index, \( AS \) is adjusted sales, and \( Y \) is the year of observation. However, the within transformation eliminates \( F \) and any intercept term, which both remain constant for each firm across all observations. Furthermore, some of the coefficients associated with the remaining variables are restricted to zero for each of the models estimated, resulting in the following four models.

Model 1: 
\[ \sum \alpha_j C_j + \beta_{GMj} GM_j + \beta_{CIm} CI_j + \beta_{GIf} GI_j + \epsilon_i \]  
(1)

Model 1(a): 
\[ \sum \beta_j Y_j + \beta_{GMj} GM_j + \beta_{CIm} CI_j + \beta_{GIf} GI_j + \epsilon_i \]  
(2)

Model 2: 
\[ \sum \alpha_j C_j + \beta_{GMj} GM_j + \beta_{CIm} CI_j + \beta_{GIf} GI_j + \beta_{ASi} AS_i + \epsilon_i \]  
(3)

Model 2(a): 
\[ \sum \beta_j Y_j + \beta_{GMj} GM_j + \beta_{CIm} CI_j + \beta_{GIf} GI_j + \beta_{ASi} AS_i + \epsilon_i \]  
(4)

Model 1 follows the model developed by Gaur et al. (2005) to determine the average industry-wide relationships between inventory turnover and both the control variables and time for U.S. publicly traded wholesalers, while Model 2, additionally, includes each firm’s inflation adjusted annual revenue to control for size as suggested by Gaur and Kesavan (2009). In both of these models, a
dummy variable for each year other than 1981 is included to allow for a detailed analysis of how average wholesaler inventory turnover has changed since 1981. A dummy variable for 1981 is excluded to avoid the “dummy variable trap.” Because the dependent variable of both of these models is the natural logarithm of inventory turnover, the coefficients associated with GM, CI, GI, and AS will reveal the percentage change in inventory turnover associated with a 1% change in the respective variable, and the coefficients associated with each year’s dummy variable will reveal the approximate percentage change in inventory turnover from the 1981 level after controlling for the other independent variables. Conducting a transformation described by Kennedy (1981) provides an even closer approximation, and results of this transformation of the coefficients are reported in the results section. Rather than multiplying the estimated coefficient, \( c \), by 100 to find the percentage increase over the base year, the following calculation is conducted:

\[
exp\left(\frac{-1}{2} \text{Var}(\epsilon)\right) - 1.
\]

It should be noted that the impact of this transformation is only significant for estimated coefficients with larger values. Models 1(a) and 2(a) use year as an independent variable rather than the matrix of dummy variables to test for any overall trends in wholesaler inventory turnover between 1981 and 2012. In the case of these models, the coefficient associated with year in each secondary model will reveal the average annual percentage change in inventory turnover.

**ESTIMATION AND RESULTS**

Equations 1–4 were estimated using the iterative Pool command in Shazam econometric software. This pooled cross section time series estimation corrects for autocorrelation with a different value of rho (autocorrelation parameter) for each cross section (firm) and heteroskedasticity between cross sections. Preliminary statistical tests of the data provided justification for these assumptions of the models.

Table 2 details the results of the analyses, which will be employed to test Hypotheses 1 through 5. Estimated coefficients for both models are listed as well as the percent change in inventory turnover associated with a 1% (GM, CI, GI, AS) or one unit (\( Y, C \)) change in the independent variable. As would be expected, the inclusion of the size variable (Model 2 and 2a) resulted in a higher Buse (1973) \( R^2 \) value even though, unlike a traditional measure of \( R^2 \), the Buse (1973) \( R^2 \) does not always increase with the addition of more variables. Because the firm effects were subtracted from the data, the listed values of \( R^2 \) reflect only the amount of intra-firm variation in inventory turnover explained by the models.

Results of the analysis were very similar across all four models, and testing of Hypotheses 1–3 yield the same results for all four models. Hypothesis 1 is supported, and there is a negative relationship between gross margin and inventory turnover. On average, a 1% increase in gross margin is associated with a 16% decrease in inventory turnover. This confirms previous findings by
Gaur et al. (2005) that there does appear to be a tradeoff between gross margin and inventory turnover. Hypothesis 2 is also supported, and there is a positive relationship between capital intensity and inventory turnover. On average a 1% increase in capital intensity is associated with a 4–5% increase in inventory turnover. This also is consistent with previous literature and indicates that the net impact of capital investments in property, plant, and equipment is reduced inventory investment. Hypothesis 3 is supported also, and there is a positive relationship between growth index and inventory turnover. On average, a 1% increase in growth index is associated with a 35–39% increase in inventory turnover. Again, this is consistent with previous impact and indicates that inventory levels decrease when sales are higher than expected.

Hypothesis 4 can only be tested by Models 2 and 2(a), and hypothesis testing yields the same results for both models. Hypothesis 4 is supported and confirms previous work by Gaur and Kesavan (2009). There is a positive relationship between firm size and inventory turnover, indicating that some level of economies of scale or scope exist in the U.S. wholesale industry. On average a 1% increase in sales results in a 9–10% increase in inventory turnover.

Hypothesis 5 can be tested by all four models and the results vary significantly between Models 1/1(a) and 2/2(a). Models 1 and 1(a) do not control for firm size but do control for gross margin, capital intensity, and growth index. Hypothesis 5 is supported by both of these models. According to Model 1, average inventory turnover was not significantly different from the 1981 level between 1982 and 1992 but was significantly higher than the 1981 level between 1993 and 2012. In fact average inventory turnover in 2012 was 20.12% higher than in 1981.

According to Model 2, average inventory turnover has increased an average of 0.54% every year since 1981. Figure 3 graphically illustrates the results of the analysis of Models 1 and 1(a). The solid line illustrates the coefficient estimates of each year’s dummy variable and the vertical lines represent a 95% confidence interval of those estimates. The dashed grey line shows the percentage increase of inventory turnover above 1981 levels for each year of the study using the estimation described by Kennedy (1981) and the dashed black line shows the trend line obtained from Model 1(a). Therefore after controlling for gross margin, capital intensity, and growth index, average inventory turnover for publicly traded U.S. wholesalers has been increasing since 1981.
### Table 2
**Full Estimation Results – Coefficient**
(Percent Change in IT for a 1 Percent/Unit Change in Variable)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 1(a)</th>
<th>Model 2(a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GM</td>
<td>$\beta_{GM}$</td>
<td>-0.163* (−16.30%)</td>
<td>-0.156* (−15.63%)</td>
<td>-0.163* (−16.32%)</td>
<td>-0.158* (−15.80%)</td>
</tr>
<tr>
<td>CI</td>
<td>$\beta_{CI}$</td>
<td>0.047* (4.70%)</td>
<td>0.045* (4.46%)</td>
<td>0.042* (4.24%)</td>
<td>0.035* (3.50%)</td>
</tr>
<tr>
<td>GI</td>
<td>$\beta_{GI}$</td>
<td>0.390* (39.00%)</td>
<td>0.349* (34.91%)</td>
<td>0.399* (39.90%)</td>
<td>0.355* (35.48%)</td>
</tr>
<tr>
<td>AS</td>
<td>$\beta_{AS}$</td>
<td>-</td>
<td>-</td>
<td>0.095* (9.48%)</td>
<td>-</td>
</tr>
<tr>
<td>Y</td>
<td>$\beta_{Y}$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.005* (0.54%)</td>
</tr>
<tr>
<td>C1982</td>
<td>$\alpha_{1982}$</td>
<td>-0.014 (−1.38%)</td>
<td>-0.012 (−1.17%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1983</td>
<td>$\alpha_{1983}$</td>
<td>-0.009 (−0.87%)</td>
<td>-0.004 (−0.40%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1984</td>
<td>$\alpha_{1984}$</td>
<td>-0.005 (−0.57%)</td>
<td>-0.002 (−0.25%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1985</td>
<td>$\alpha_{1985}$</td>
<td>-0.024 (−2.39%)</td>
<td>-0.020 (−2.02%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1986</td>
<td>$\alpha_{1986}$</td>
<td>-0.035 (−3.49%)</td>
<td>-0.031 (−3.06%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1987</td>
<td>$\alpha_{1987}$</td>
<td>-0.026 (−2.59%)</td>
<td>-0.023 (−2.32%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1988</td>
<td>$\alpha_{1988}$</td>
<td>-0.011 (−1.13%)</td>
<td>-0.015 (−1.57%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1989</td>
<td>$\alpha_{1989}$</td>
<td>0.003 (0.29%)</td>
<td>-0.010 (−1.06%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1990</td>
<td>$\alpha_{1990}$</td>
<td>0.023 (2.26%)</td>
<td>0.002 (0.20%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1991</td>
<td>$\alpha_{1991}$</td>
<td>0.026 (2.56%)</td>
<td>0.005 (0.42%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1992</td>
<td>$\alpha_{1992}$</td>
<td>0.031 (3.07%)</td>
<td>0.008 (0.77%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1993</td>
<td>$\alpha_{1993}$</td>
<td>0.065** (6.65%)</td>
<td>0.039 (3.89%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1994</td>
<td>$\alpha_{1994}$</td>
<td>0.097* (10.15%)</td>
<td>0.063* (6.48%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1995</td>
<td>$\alpha_{1995}$</td>
<td>0.092* (9.57%)</td>
<td>0.048 (4.92%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1996</td>
<td>$\alpha_{1996}$</td>
<td>0.084* (8.66%)</td>
<td>0.029 (2.86%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1997</td>
<td>$\alpha_{1997}$</td>
<td>0.092* (9.57%)</td>
<td>0.025 (2.45%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1998</td>
<td>$\alpha_{1998}$</td>
<td>0.091* (9.49%)</td>
<td>0.009 (0.87%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C1999</td>
<td>$\alpha_{1999}$</td>
<td>0.095* (9.88%)</td>
<td>0.002 (0.16%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2000</td>
<td>$\alpha_{2000}$</td>
<td>0.128* (13.63%)</td>
<td>0.028 (2.74%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2001</td>
<td>$\alpha_{2001}$</td>
<td>0.137* (14.67%)</td>
<td>0.032 (3.20%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2002</td>
<td>$\alpha_{2002}$</td>
<td>0.142* (15.23%)</td>
<td>0.038 (3.77%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2003</td>
<td>$\alpha_{2003}$</td>
<td>0.162* (17.51%)</td>
<td>0.054 (5.47%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2004</td>
<td>$\alpha_{2004}$</td>
<td>0.192* (21.05%)</td>
<td>0.074* (7.64%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2005</td>
<td>$\alpha_{2005}$</td>
<td>0.189* (20.73%)</td>
<td>0.061 (6.25%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2006</td>
<td>$\alpha_{2006}$</td>
<td>0.191* (21.00%)</td>
<td>0.052 (5.31%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2007</td>
<td>$\alpha_{2007}$</td>
<td>0.193* (21.18%)</td>
<td>0.044 (4.43%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2008</td>
<td>$\alpha_{2008}$</td>
<td>0.205* (22.71%)</td>
<td>0.050 (5.06%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2009</td>
<td>$\alpha_{2009}$</td>
<td>0.186* (20.41%)</td>
<td>0.033 (3.34%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2010</td>
<td>$\alpha_{2010}$</td>
<td>0.198* (21.80%)</td>
<td>0.048 (4.83%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2011</td>
<td>$\alpha_{2011}$</td>
<td>0.198* (21.78%)</td>
<td>0.040 (4.03%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C2012</td>
<td>$\alpha_{2012}$</td>
<td>0.184* (20.12%)</td>
<td>0.020 (1.99%)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Estimated using year as an independent variable to see overall trend in inventory turnover.

*p < 0.01

**p < 0.05

Buse R²: 0.439 0.451 0.415 0.431
On the other hand, Hypothesis 5 is not supported by either Model 2 or 2(a). With the exception of 1994 and 2004, the average inventory turnover was not significantly different from 1981 levels for any year in the sample period. Average inventory turnover was 6.48% higher in 1994 and 7.64% higher in 2004 than 1981 levels. Model 2(a) revealed a negative but non-significant downward trend in inventory turnover of publicly traded U.S. wholesalers between 1981 and 2012. Figure 4 show a graphical representation of these results following the same format as Figure 3. Comparing the results of testing Hypothesis 5 for both Models 1 and 2 shows that the majority of the increases in wholesalers’ inventory turnover since 1981 can be explained by economies of scale and/or scope in that larger wholesalers can more efficiently manage their inventory simply because of their larger scale and/or scope.
CONCLUSION

Results of this study confirmed that previously found results relating retailers’ gross margin, capital intensity, growth index, and size can also be applied to wholesalers. Specifically, that a tradeoff does exist between gross margin and inventory turnover, and that increases in capital intensity, growth, and firm size all lead to increases in inventory turnover. These results imply that if inventory turnover is used as a key metric in inventory management, it would be appropriate to use an adjusted inventory turnover (AIT) similar to that suggested by Gaur et al. (2005). This AIT would be computed as the residual plus the time effect and could be computed at every point in the data set. Using AIT rather than inventory turnover could impact a firm’s ranking as related to both their competitors and themselves in prior years. For exemplary purposes, Figure 5 shows that industry average AIT is lower than and has increased less over time than IT.

![Figure 5: Industry Average IT vs. AIT](image)

Source: Standard and Poor’s Compustat North America

Results of this study further reveal that, after controlling for gross margin, capital intensity, growth, and firm size, no long-term time trend of inventory turnover in U.S. wholesalers exists. Increases in inventory efficiency from an increased focus on inventory reduction, inventory management, and information technology have apparently been offset by other changes to firms such as increased product proliferation and increased offshore sourcing leading to longer and less reliable supply chains. Specifically, increased product proliferation should lead to decreased inventory efficiency as a firm would be forced to maintain safety stock for each additional product it sells in order to maintain customer service levels. Additionally, increased offshore sourcing and longer, less reliable supply chains would force a firm to maintain higher levels of safety stock to maintain customer service levels during the longer, less certain lead time. However, since
data on these factors was not included in this study, it is possible that the lack of improvements in inventory efficiency can be explained by other factors.

While these results are counter to those of Chen et al. (2007), those authors did not control for firm size. The importance of controlling for firm size when examining trends in inventory turnover levels can be seen by comparing Model 1 with Model 2. The strong increasing trend in Model 1 is eliminated after controlling for firm size in Model 2.

Based on these results, the primary contribution of this study is revealing that most of the apparent improvements in the inventory improvements of publicly traded U.S. wholesalers can be explained by the increase in size of these companies. The implications of this are that comparing firms’ inventory efficiency based on inventory turnover is of limited value, so calculating an adjusted inventory turnover for comparisons is more appropriate. Further contributions of this study are verifying that results of previous studies into the relationship between inventory performance and various factors of retailers also exist in the wholesale industry. Specifically that there is a negative relationship between gross margin and inventory turnover and positive relationships between inventory turnover and capital intensity, growth index, and firm size.
REFERENCES


Book Reviews
The Brain and Emotional Intelligence: New Insights

By Daniel Goleman
More Than Sound, Florence, MA © 2011

Reviewed by Doug S. Russell

Daniel Goleman continues his research of Emotional Intelligence (EI), with updates on the key findings that further inform our understanding of EI. The short book is aimed at leaders, coaches, managers, and educators who want to learn how to apply the EI skill set.

In The Brain and Emotional Intelligence: New Insights, Goleman cites studies that support his argument that EI is a phenomenon separate from Intelligence Quotient (IQ). For example, Goleman lists several characteristics that help make up EI, which are distinctly different from a person’s IQ. Among those characteristics are: creativity, drive, persistence, motivation, rapport, and empathy. He cites several documented research studies that he says, “tell us there are brain centers that govern EI, which distinguishes this set of human skills from academics (verbal, math, and spatial) intelligence, or IQ.”

Goleman also talks about the importance of self-awareness in EI. He relates the story of a brain-damaged lawyer whose intellect was unaffected, but who was unable to make even simple decisions. Unable to connect his thoughts with his emotions, he was reduced to being unable to tell good decisions from bad. In order to make good decisions, we need to have feelings or emotions about our thoughts. Since most decisions involve ethical consideration, Goleman also talks about the importance of “gut feelings” in making the right ethical decision—especially in business and leadership positions.

In the chapter, “Self-Mastery: The Right Brain State for the Job,” he presents his research on various positive and negative mental states. For example, in
positive states of mind we are more creative, but may also be less discriminating. In negative moods we may be unpleasant to be around, but we also pay more attention to detail. Goleman also discusses how the amygdala, which is responsible for the “flight or fight” reflex, can hijack the entire brain, which leads to increased stress and panic. In the workplace, Goleman identifies the top five amygdala triggers: being treated unfairly, condescension/lack of respect, lack of appreciation, unable to meet unrealistic deadlines, and believing you are not being listened to. To make the amygdala less likely to be hijacked, you can use the tools of self-awareness, self-talk, empathy, and mediation.

Additionally, Goleman reviews research on such topics as stress, motivation, rapport, empathy, creativity, and sociopath behavior. For example, in regard to rapport, online business interactions can be so much more argumentative than face-to-face encounters. EI is more prevalent in face-to-face meetings, as they are deemed more personal. Further, one of the most important aspects of EI for leaders, says Goleman, is creativity. In a world of cubicles, cookie-cutter office buildings, and filing cabinets, creativity may not be the first thing you think about. While we may not all be brilliant artists or musicians, Goleman says, “we’re all creative to one extent or another.” A leader’s ability to foster innovation in their group is essential to having companies thrive.

Finally, *The Brain and Emotional Intelligence: New Insights* is an excellent short read on the continuing research of Daniel Goleman. If you are looking for some information that will help you in understanding the brain, and more importantly, the biology and psychology of the brain, then this book is for you. The ever-changing corporate world can use the interesting findings of Goleman’s EI research. He hits a homerun with his ability to take complex neuroscience and academic material, and relate it to everyday business decisions.
Too Big to Ignore: The Business Case for Big Data

By Phil Simon

*John Wiley & Sons, Hoboken, NJ © 2013*

Reviewed by Joni Adkins

Big data is getting a lot of attention today, and Phil Simon’s *Too Big to Ignore: The Business Case for Big Data* provides an excellent overview of how big data is impacting today’s businesses and organizations. Insurance companies, baseball franchises, and city governments are using big data analytics to discover patterns and make better decisions. Driving forces of big data include the always-on consumer, plummeting technology costs, rise of data science, Google and infonomics (study of quantifying, managing, and leveraging information), the platform economy, social media, and 11/12 watershed. The 11/12 watershed refers to November 2012 where big data played an important role in predicting Hurricane Sandy and predicting Obama’s sizeable presidential win.

Data are not only increasing in size but also changing in type. Most databases previously held only structured data. We now see more unstructured data, often due to social media data that is created outside the organization. Big data is dynamic, consumer driven, and incomplete. The format of big data is forcing data mining tools to be updated. Big data techniques include statistical techniques and methods like regression and A/B testing, data visualization including heat maps and time series analysis, and semantics like natural language processing and text analytics. Simon gives an overview of these various techniques and how they are used with big data. The chapter on big data solutions provides a solid foundation so business executives can speak basic big data language. Simon discusses Hadoop, Cloudera, MapR, NoSQL, NewSQL, and columnar databases to provide fundamental information about these timely technologies.
Three case studies about Quantcast, Explorys health care, and NASA demonstrate successful initiatives using big data. The cases highlight how small data tools do not work on big data, how small companies can benefit from big data, the importance of using the open source community, and how big data storage costs can be significantly lower than using traditional relational database systems. While open source tools like Hadoop are free, Simon stresses that new big data initiatives must be supported with a budget including employee development and outside consulting. There is a shortage of employees with big data skill sets, so developing your own high potential employees might be better than trying to hire qualified experts.

As with all technology initiatives, security and privacy are concerns. Simon reminds us that “Yes, big data is cool, but it is also scary; it is concurrently beneficial and potentially malevolent” (p. 195). Companies need to be aware of these issues and take steps to protect the data. Simon shares examples of companies that have faltered in their security and privacy attempts.

A company that wants to begin analyzing big data does not have to start with a major initiative. Simon recommends starting small with an inefficient or expensive process where benefits might quickly be realized. Big data does not lend itself well to a set of step by step directions, so those experimenting with big data should be prepared to work multiple iterations to discover information to support decision making.

Research has consistently shown that many people use heuristics to make decisions. Simon argues that decision makers in organizations will need to start embracing big data as they make decisions or their companies may perish. This will be difficult, as relying on data to make decisions challenges the expertise and experience that many professionals use. Big data is at its beginning, but there is tremendous opportunity with big data if users will embrace its insights and use it to make better decisions.

This book is appropriate for a business student or leader to understand some of the basic terminology about big data as well as read about some real world applications of big data. Simon uses clear language making the book easy to read; a background in information technology or programming is not necessary. It does not provide a tutorial on using any specific software as its goal is not providing “how to” instructions. I recommend this book for anyone who wants to learn more about the big data trend impacting organizations. Those who do read this book will be able to have an intelligent conversation about big data.
Lean In: Women, Work, and the Will to Lead

By Sheryl Sandberg

Random House, NY © 2013

Reviewed by Cindy Kenkel

Chief Operating Officer of Facebook, Sheryl Sandberg, has written what started off as a fairly controversial book about women and work. Before it hit the shelves, it was receiving criticism for not focusing enough on the institutional and social barriers women face. The book provides a plethora of current research that indicates men and women have different communication styles, personality tendencies, societal expectations, work relationships, and career opportunities. She uses an easy-to-read style to recount stories that focus primarily on internal obstacles women face and ways they tend to hold their own careers back. However, despite the initial criticism that she is blaming women for this, she has also focused on how company culture, societal expectations, and systems impact this issue. Sandberg does focus primarily on internal struggles women face but frames the entire discussion within the context of the reality women face. She summarizes her focus well by stating, “I am encouraging women to address the chicken, but I fully support those who are focusing on the egg” (p. 9).

Sandberg believed feminist from the sixties and seventies had already laid the groundwork for her generation to achieve equality, so when she attended college in the eighties, she certainly did not identify herself as a women’s activist. Later, while working at Google, Sandberg realized she needed to tackle the issue of gender equality head on. She has even referred to this book as a “sort of feminist manifesto” and when asked by former colleagues if this is her thing, she now responds “yes.”

Sandberg encourages women to “Sit at the Table” and behave as participants instead of spectators. What Sandberg noticed, and research confirmed, is that
men volunteer for opportunities more often and faster than women do. She recalls a story to perfectly illustrate this behavior. At the conclusion of time allotted for a question and answer segment of one of her speaking engagements, she realized many hands were still up in the audience so she informed the group of the time limitation. Who put their hands down? The women. The men kept theirs up and many were able to ask their question. The real sting of this situation transpired after the event while she conversed with those willing to wait for an opportunity to talk to her. One woman told her she learned a tremendous lesson at the speech. She told Sandberg that in the future, she would keep her hand up instead of politely withdrawing it when a group is told there is not enough time left to answer all of the questions. Institutions and individuals need to encourage and champion women based on this knowledge. “If we want a world with greater equality, we need to acknowledge that women are less likely to keep their hands up” (p. 36).

Research about success and likeability of men versus women is upsetting. The bottom line is that “success and likeability are positively correlated for men and negatively correlated for women” (p. 40). A case study backed up this view. Participants were provided with the same data regarding career accomplishments of “Heidi” and “Howard” with gender as the only variable. While both were respected, Heidi was seen as selfish while Howard was viewed positively. The impact of this on a woman’s career is colossal because it plays a critical role in career success ranging from one’s likelihood of earning invitations to join a high priority project, to their ability to achieve a fair rating on a peer performance appraisal. Popular interview advice given to women that they promote their qualifications by citing examples of what they have previously achieved may actually be backfiring on them. “In fact, a woman who explains why she is qualified or mentions previous successes in a job interview can lower her chances of getting hired” (p. 44). This element comes into play and is one reason women are less likely to negotiate than men. Sandberg also said she sees this bias play out frequently on performance evaluations. When she sees a comment like, “While she’s really good at her job, she’s just not as well-liked by her peers” she realizes this likeability factor may be bias at work (p. 153).

Sandberg bravely acknowledges the realities of mentor/mentee relationships and gender. Men have an easier time finding a mentor, and they are more likely to be satisfied with their rate of advancement (p. 67). She admits the typical advice given to women to recruit a mentor is often misguided as they frequently solicit mentors before they have gotten to know them. Sandberg has had complete strangers ask her to serve as their mentor. One report referenced in the book indicates women who found their mentor through a formal program were 50% more likely to have received a promotion. Lastly, she points out “there are some tricky issues to be solved here, including the perceived sexual context of male-female relationships” (p. 72). Throughout the book, Sandberg gives tremendous credit to those who have served as a mentor.
While Sandberg admits the truth hurts, she still spends an entire chapter encouraging readers to “Seek and Speak the Truth” (chapter 6 title). The author acknowledges that we are rarely lucky enough to work at a place where people are actually speaking the truth. This point is not to suggest employees are inherently dishonest but that employees are, by and large, afraid to speak up because of the impact their views will have on the relationships they have developed. Women are more likely to be concerned with hurting another’s feelings than men are.

Several self-deprecating stories are shared to highlight how Sandberg learned this lesson. Throughout the book, Sandberg makes it clear that like most women, she does care (sometimes too much) about what others think about her, and she admitted there has even been a time or two where this brought her to tears.

Another critical point made in the book is “Women rarely make one big decision to leave the workforce. Instead, they make a lot of small decisions along the way, making accommodations and sacrifices they believe will be required to have a family. Of all the ways women hold themselves back, perhaps the most pervasive is that they leave before they leave” (p. 93). The author makes it clear she is not suggesting women should stop scaling back in order to balance work and family, but she shares examples of women who have withdrawn their name from positions or project because they will be starting a family in the future. She points out “What I am arguing is that the time to scale back is when a break is needed or when a child arrives—not before, and certainly not years in advance” (p. 95). She encourages open dialog regarding issues of balancing work and family and fears employers are too often handcuffed with human resource requirements to have a candid discussion about this issue. When referring to laws that protect women and minorities from discrimination Sandberg says, “I have also witnessed firsthand how they can have a chilling effect on discourse, sometimes even to the detriment of the people they are designed to defend” (p. 151).

For true equality at work, Sandberg believes men need to be more empowered at home. She believes women inadvertently discourage husbands from doing their share of the household and childcare duties. The author says she tries to focus completely on her kids on weekends, and she admits she and her husband have a fairly typical division of labor with her husband paying the bills, handling the finances, and technical support. She schedules the kids’ activities, buys groceries, and plans birthday parties. Sandberg admits, “I still struggle with the trade-offs between work and home on a daily basis. Every woman I know does, and I know that I’m far luckier than most” (p. 134). A few interesting statistics were contained within this chapter. The first is that when a wife earns half the family income and a husband does half of the housework, their rate of divorced is reduced by half (p. 118). Perhaps the next statistic would take some of the pressure off of women. In 1975, stay-at-home mothers spent eleven hours a week focused completely on their children, which is exactly the same amount of time women who work outside the home today spend devoted to the same activities (p. 134).