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Interdisciplinary Journal on Risk and Society

Accounting Conversations: A Case Study in Auditor Communications 1

Sarah Bee, Syeda Iram Jafry, and Gabriel Saucedo

Rehiring the Retired: An Examination of Double Dipping in Public School Districts 13

Nina T. Dorata, Cynthia R. Phillips, and Joan Fico

Corruption and Culture: Empirical Analyses of Long-Term Indulgence and Corrupt Systems 30

Charles Lanier and Mary Kirchner

Institutions in the Shark Fin Market: Externalities and Incentives 44

Nathaniel Grimes

Minimizing Insider Threat Risk with Behavioral Monitoring 61

I. Hilmi Elifoglu, Ivan Abel, and Özlem Taşseven

Regional Growth and Transportation Infrastructure from Greenways to Public Transit 74

Robert Salvino, Trevor Tarleton, Nicole Kuhn, and Raegan Kauffman

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FROM THE DEPARTING EDITOR

It has been my pleasure to work with so many of you during my tenure as Editor as I write this final “From the Editor” letter.

I want to thank the many authors and reviewers who helped us publish memorable articles during my ten-year tenure as the Editor of the *Review of Business (ROB)*. Since the future holds many promises, I would like to have a look back to the beginning of *ROB* before introducing you to the new Editor.

Our first monthly publication in May 1964 was entitled *Business Newsletter* and it covered the area of Queens, New York, reporting on a variety of local business news and statistics edited by the recently-retired Professor Francis A. Lees. In the first issue, St. John’s University President, Very Rev. Edward J. Burke, C.M., wrote a prescient message, “Through this publication and other means St. John’s hopes to foster a mature understanding of the problems which confront our business community. With the cooperation of business leaders, we shall strive to embrace our aggregate knowledge and business acumen so that both the community and St. John’s may grow stronger and prosper together.” He added further that “the College of Business Administration faculty is but one example of the rich academic and professional endowment of resources which St. John’s brings to support of community service.”

In January of 1968, the *Business Newsletter* was renamed the *Review of Business* and expanded its focus to cover business and financial activity in the greater metropolitan area, including business forecasting. On the cover of the first page, Professor Francis J. Lees wrote, “It is our hope that, through expanded coverage and in-depth analysis of the business scene, the *ROB* will prove of even greater service.”

Since then, several editors confirmed the service to the community and thus focused on practical application of scholarship by publishing articles across many business fields. The scope became national, and it contained insightful interviews with business leaders that embarked on change as well as articles dedicated to the applications of best practices.

My tenure began in 2008 during a challenging year as the economy slumped into the Great Recession, resulting in many articles concerning financial and business changes in the U.S. economy. We expanded our Review Board internationally and made our publication a strict peer-reviewed academic journal that also focused on applicability of research ideas. Our journal had many international authors, and it expanded globally with its online presence, and yes, true to our Vincentian values, we are still here to be of service to the broad community.

I turn over the editorship of *ROB* to Professor Nicos Scordis, an excellent professional and scholar, who will introduce the articles in this issue and take the *ROB* forward.

With sincere thanks,
Igor M. Tomic

FROM THE INCOMING EDITOR

Professor Igor M. Tomic merits all credit for the robust reputation of the journal, for its broad reach, and for its successful indexing. Professor Tomic has solidly established the journal's intellectual and scholarly credentials. This makes it easy for an incoming editor, but at the same time creates a legacy to uphold. My sincere thanks and appreciation to Igor M. Tomic for all that he has accomplished for this journal.

While only one of the papers in this issue uses the term *risk* in its title, all the papers engage with behaviors and actions that generate or propagate risk. Such behaviors range from failed audits because of ineffective communication, to entrenchment that leads to double dipping by retirees, to ill-defined property rights encouraging the market for shark fins. There are also papers at the intersection of risk and society as they explore issues in the evolution of corruption and in the link between suburbanization and environment. In fact, a reading of recent issues reveals a journal that broadly engages with risk in business and in society. Thus, the orientation of the journal.

This journal, the *Review of Business: An Interdisciplinary Journal on Risk and Society*, aspires to publish original work that engages with the role/impact of risk and/or uncertainty in business decision-making and/or on society. The journal welcomes research from all the diverse ways business engages with risk and uncertainty as well as how such engagement, in turn, impacts society. The journal welcomes all research methodologies and writing styles.

The journal encourages a distinction between risk and uncertainty. Distinguishing between risk and uncertainty (as first done by Willett, 1901,¹ Knight, 1921,² and Keynes, 1937³) leads to a better understanding of our world. The distinction matters because the analysis tools for risk are different from those for uncertainty (see, for example, Klein, 1998,⁴ or Friberg, 2015⁵). Furthermore, our cognitive biases influence us to behave differently toward risk than toward uncertainty (see, for example, the body of work originating with Tversky and Kahneman, 1971,⁶ or Douglas and Wildavsky, 1982⁷).

The journal's peer-review process focuses on providing a manuscript's authors with an understanding of the actions they may need to take, if any, to improve their manuscript. Thus, the outcome of the review process is specific, authoritative, and actionable. The journal's reviewers continue to be mindful of how a good review helps turn a weakness in a manuscript into a strength, or how a good review can help highlight a manuscript's strength.

Do not hesitate to e-mail me (ROBjournal@stjohns.edu) with any questions you may have.

Have a great summer,
Nicos A. Scordis

¹Willett, A. 1901. *The Economic Theory of Risk and Insurance*. New York, NY: Columbia University Press.

²Knight, F. 1921. *Risk, Uncertainty and Profit*. Cambridge, MA: Riverside Press.

³Keynes, J. M. 1937. The General Theory of Employment. *Quarterly Journal of Economics*, 51(2), 209–223.

⁴Klein, G. 1998. *Sources of Power: How People Make Decisions*. Cambridge, MA: MIT Press.

⁵Friberg, R. 2015. *Managing Risk and Uncertainty: A Strategic Approach*. Cambridge, MA: MIT Press.

⁶Tversky, A., and Kahneman, D. 1971. Belief in the Law of Large Numbers. *Psychological Bulletin*, 78(2), 105–110.

⁷Douglas, M., and Wildavsky, A. 1982. *Risk and Culture*, Oakland, CA: University of California Press.

Accounting Conversations: A Case Study in Auditor Communications

Sarah Bee

Syeda Iram Jafry

Gabriel Saucedo

Abstract

This case requires students to exhibit their ability to effectively communicate and request accounting information as part of an operational audit. As internal auditors for ABC Inc., students will coordinate all agendas and logistics for three separate meetings with the fixed asset manager: a kickoff meeting, a walk-through meeting, and a closing meeting. During each meeting students demonstrate different effective communication techniques to achieve the goals of the audit. Upon the conclusion of each meeting, students receive quantitative and qualitative feedback in alignment with the communication competencies of the AICPA and IIA. Accounting involves looking beyond the numbers and includes gathering, preparing, and communicating reliable information to stakeholders. Furthermore, communicating the right message can be the difference between an audit team playing a largely reactive or proactive role. This case will help students develop their communications skill set, which is one of the most important success factors desired in accounting professionals.

COMPANY OVERVIEW

ABC Inc. is a regional manufacturer of wood furniture products, located just outside of Seattle, Washington. The company is well known in the Pacific Northwest because of its commitment to quality and its use of sustainable forest products. It was founded in 1979 by R. C. Wilson, who still governs the company as president and CEO. ABC Inc. products are sold throughout the West Coast of the United States, and in recent years the company has expanded distribution to Alaska and Hawaii, as well as other major metropolitan markets such as Austin,

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We would like to thank employees of Nordstrom's Internal Audit Department for providing feedback on this case, and for volunteering as the client in the case pilot. We would also like to separately thank delegates of the 2017 Global Business Research Symposium for their comments and suggestions on earlier versions of this case.

Denver, and Chicago. Sales in the latter markets have been driven by the overwhelming domestic demand for environmentally conscious products.

ABC Inc. carefully manages its inventory in order to reduce waste and avoid unnecessary costs. In addition to the administrative group, it has seven primary departments, including purchasing, manufacturing (located in Everett, WA), sales and marketing, human resources, finance, IT, and R&D.

ABC Inc. is an unlisted company, with 25 private shareholders, but the company is equally balanced, with financing from both shareholder investments and bank loans. R. C. Wilson reinvests profits back into the business, but also distributes a significant portion of income to shareholders via dividends every year. The company is U.S. GAAP compliant and has received a clean financial statement audit opinion from a notable mid-tier accounting firm every year since its inception.

The relationship between ABC's management and the external audit engagement team has been good during previous audits. The financial statement audit is a debt covenant requirement imposed by the company's lenders, but R. C. Wilson also favors the annual audit as a sign of strong corporate governance. Fixed assets represent the single largest component of the company's balance sheet. Selected financial results for ABC Inc. are provided in Figure 1.

ABC Inc. is committed to maintaining its production in the United States. As such, the company is always looking for ways to reduce costs and to be as efficient as possible in all aspects of its business. The company has maintained a small internal audit department for more than 20 years. The core internal audit function is made up of certified internal auditors knowledgeable in both financial accounting and operational processes.

While the internal audit department does not have the resources to conduct a full-scope audit of all accounts and processes every year, the internal audit plan does cover high-risk accounts and processes annually, and all accounts and processes are scoped in every five-year cycle. ABC Inc. has been able to maintain its costs even during downward economic trends, and has not experienced any major restructuring or layoffs.

CASE REQUIREMENTS

You are a staff member in the ABC Inc. internal audit department, about to commence an operational audit of fixed assets. While fixed assets have been audited by the external auditors for financial statement purposes every year, it has been two to three years since fixed assets underwent operational review by the internal audit function.

At this time, the specific scope of your fixed assets audit is *the acquisitions process only*. Other fixed assets sub-processes are being audited by other members of the internal audit function.

You are responsible for the timely coordination of all agendas and logistics for three separate meetings with ABC Inc.'s fixed asset manager. During each meeting you will demonstrate different effective communication techniques to achieve the goals of the audit. The chief internal auditor will provide you all necessary deliverables prior to each meeting.¹ The chief internal auditor will also

¹The chief internal auditor will be role-played by your course instructor or case facilitator. The fixed asset manager will be role-played by an accounting professional at the designation of your course instructor or case facilitator.

FIGURE 1. Selected Financial Results for ABC Inc.

ABC Inc. Income Statement (in \$U.S. thousands) For the Current and Prior Year Ended December 31			ABC Inc. Balance Sheet (in \$U.S. thousands) Current and Prior Year December 31		
	Current Year	Prior Year		Current Year	Prior Year
Revenue	32,658	29,293	Cash and cash equivalents	550	536
Cost of sales	18,221	16,372	Accounts receivable	2,500	2,548
Selling, general, and administrative expenses	10,388	9,128	Total inventories	5,498	4,927
Other expense (income)	537	464	Other current assets	6,659	6,886
Net income	\$3,512	\$3,329	Fixed assets, net	25,355	24,919
			Total assets	\$40,562	\$39,816
			Accounts payable	4,880	5,197
			Other accrued liabilities	6,204	5,254
			Long-term debt	9,347	9,417
			Total liabilities	20,431	19,868
			Total stockholders' equity	20,131	19,948
			Total liabilities and stockholders' equity	\$40,562	\$39,816

ABC Inc. Condensed Fixed Assets Register (in \$U.S. thousands) Current Year Ended December 31	
	Ending Balance
Land	2,499
Buildings	3,323
Leasehold improvements	1,664
Machinery	16,263
Computing equipment	619
Furniture and fixtures	987
Total fixed assets, net	\$25,355

facilitate the initial introduction between your audit team and the fixed asset manager.

A condensed fixed assets register has already been furnished to you by the fixed asset manager, so you can get a general understanding of the type and dollar magnitude of ABC Inc.'s fixed assets.² In summary, the three meetings you will conduct include:

Kickoff Meeting. During the kickoff meeting you are expected to build a relationship with the fixed asset manager, outline roles and expected contributions for the audit, establish goals and an action plan, and ensure that all parties have a clear and shared understanding of the audit process and the necessary deliverables.

Walkthrough Meeting. The fixed asset manager will take you and the audit team through one fixed asset acquisition transaction. For this specific walkthrough, the chief internal auditor has selected fixed asset requisition #175-222/352. The fixed asset manager will provide the supporting

²While often included in a fixed assets register, disposals and depreciation are outside the scope of this case. Therefore, those amounts are not included here.

documentation for the acquisition only upon specific request by you and the audit team. The chief internal auditor expects you to make sufficient inquiries of the fixed asset manager to confirm you fully understand the acquisitions process. You should also articulate to the fixed asset manager that follow-up may be necessary to ascertain a complete understanding of the process (including process strengths and potential weaknesses).

Closing Meeting. During the closing meeting you are expected to communicate your audit findings, including the basis of your recommendation and the significance of the findings to the process. You should also justify your role in adding value to the process, and bring closure to the audit engagement, including a final agreed-upon action plan with the fixed asset manager.

At the conclusion of each meeting, you should submit all meeting materials to the chief internal auditor for inspection. The chief internal auditor will have separate discussions with the fixed asset manager in which he or she will provide the chief internal auditor both qualitative and quantitative feedback regarding your meeting.

This feedback is likely to include how well you coordinated meeting times and agendas, detailed objectives and articulated the scope of work, established action plans, followed through on commitments, provided necessary deliverables, and resolved any concerns.

Your feedback will also be assessed using core communication competencies published by the American Institute of Certified Public Accountants (AICPA) and the Institute of Internal Auditors (IIA). (See footnote 5.)

It is now time to begin preparations for your kickoff meeting. Please consult the chief internal auditor for the informative documentation needed to conduct your first meeting with the fixed asset manager.

LEARNING OBJECTIVES

While ABC Inc. is a fictitious company, the details in this case are based loosely on a real audit client. The case is structured to meet two overarching objectives driven by core competencies set forth by the Institute of Internal Auditors (IIA, 2013) and the American Institute of Certified Public Accountants (AICPA, 2017):

1. Communicate with impact.
2. Actively listen and effectively deliver information tailored to the intended audience.

In summary, this case exposes future accounting professionals to the oral and written communication skills commonly required to conduct a thorough, informative, and value-added operational audit. Therefore, at the end of the ABC Inc. case, students will understand the importance of professional and timely communication during an audit.

During the ABC Inc. case, students communicate with an accounting professional (or instructor designee) role-playing the fixed asset manager of ABC

Inc. Given the importance and validity of such interactions in the profession, it seems logical to provide students the opportunity to practice these skills during their formal education.

This argument is supported by the Big Four international accounting firms (e.g., Deloitte, 2015; Ernst & Young, 2017), as well as companies hiring internal auditors (Clune and Gramling, 2012). Across all three meetings, students will perform the following:

- Plan, coordinate, and disseminate meeting requests and agendas.
- Evaluate and synthesize relevant accounting content, as well as identify accounting and accounting-process related issues.
- Design and deliver appropriate action plans related to identified accounting issues.

MOTIVATION AND RELATED CASES

This case is designed to expose accounting students to the requisite skills to communicate accounting information as part of an audit process. Furthermore, this case affirms that new professionals, with their fresh perspectives and unique points of view, are important team players throughout the entire audit process. Outside of an analytics mindset, one of the most common skills sought from new accounting graduates today is the ability to effectively communicate (Ovaska-Few, 2017).

For example, in a survey of over 3,300 chief audit executives, the second most-desired skill was communication at 51% (analytical/critical thinking was number one at 64%; accounting was third at 43%) (Institute of Internal Auditors Research Foundation, 2015).

To our knowledge, only a handful of cases (or other pedagogical manuscripts) *directly* addressing communications in an accounting context have been published in major accounting journals (i.e., *Issues in Accounting Education* and *Journal of Accounting Education*, and more recently *Current Issues in Auditing*) over the last fifteen years: written communication skills (e.g., Ashbaugh, Johnstone, and Warfield, 2002; Reinstein and Houston, 2004; Stout and DaCrema, 2004); oral communication skills (e.g., Grace and Gilsdorf, 2004); negotiations (e.g., Johnstone and Muzatko, 2002; Trotman, Wright, & Wright, 2005); and a framework for integrating writing activities into accounting courses (Matherly and Burney, 2009).

This case differs from previous cases as it provides a comprehensive, hands-on, and interactive scenario through a small-scale operational audit. Though our case facts are loosely based on a typical scenario at an actual client, ABC Inc. provides exposure to a real-world setting that students are likely to encounter in practice. Our case also promotes the analysis of evidence and the communication of final results to client management. This format supports the development of not only day-to-day critical thinking skills expected of successful auditors, but also oral and written communication and deliberation proficiencies required of any new associate.

Furthermore, the learning and efficacy assessments within the case map directly to IIA (2013) and AICPA (2017) core competencies. As such, these ma-

terials provide for a broader scope of thinking and action in an audit setting, while at the same time integrating accounting-based competencies (Lawson, et al., 2014).

IMPLEMENTATION GUIDANCE AND EVALUATION

Implementation Guidance

This case was originally designed for use in a graduate-level accounting communications course, but it can easily be implemented and/or adapted for use in both undergraduate- and graduate-level auditing (internal auditing or financial statement auditing) courses.³

The timing of implementation within a course is largely flexible, but based on the content of the case materials, students should have a requisite knowledge of fixed asset accounting, as well as the general audit cycle. While students in this case assume the role of an internal auditor, very similar processes are undertaken by external auditors in the financial statement audit process.

For example, Arens, et al. (2017) summarize the typical financial statement audit in four phases:

- Phase I—Plan and design an audit approach
- Phase II—Perform tests of controls and substantive tests of transactions
- Phase III—Perform substantive analytical procedures and tests of details of balances
- Phase IV—Complete the audit and issue an audit report

Similarly, internal audit texts (e.g., Reding, et al., 2013) assert the engagement process includes planning, performing, and communicating.

This case consists of three separate meetings between students (i.e., the internal audit team or auditor) and the fixed asset manager (i.e., the client). The number of students on each audit team can vary dependent upon course enrollment and/or the level of work desired of each student.

We believe audit teams of four to six students is appropriate for an equitable share of work across the three client meetings. One client is assigned to each audit team at the discretion of the course instructor. We encourage instructors to recruit accounting professional contacts (e.g., Big Four audit managers, controllers, CIAs, etc.) to role-play the client.

The benefit of such recruitment is three-fold:

1. It increases the external validity of the case.
2. The feedback from each meeting is more objective (as compared to the course instructor acting as the client).
3. It showcases student abilities with external stakeholders, which can benefit both the department and student recruitment.

³ABC Inc. was developed with the assistance of the Vice President of Internal Audit and internal audit staff members of a leading fashion retailer headquartered in the western United States. The case was also reviewed by two different managing directors in the risk assurance practice of a Big Four international accounting firm, a risk advisory consultant for a reputable regional accounting firm, an internal audit manager for a notable Internet company, and an accounting manager from a significant computer networking company.

Alternatively, other accounting professors or experienced graduate students can easily fill the role of the client, as needed, but such substitutions can have diminishing returns on the benefits noted above. Each selected client should be very familiar with the case materials and have some proficiency in general role-playing to mimic an actual meeting scenario. In our experience, our appointed clients could easily draw upon their personal experiences as auditors to generate a very real setting for their audit team pairings.

The case flow and materials roadmap in Figure 2 summarizes the timing and materials for each meeting.⁴ The actual meeting time may vary by group, but approximate times have been given based on student feedback from previous uses of the case materials. All handouts for the audit team and the client are included in the exhibits, and should only be distributed by the course instructor or the client as outlined.

The client should receive all noted materials from the course instructor well in advance of each meeting. Audit team members may or may not receive materials, depending on whether they specifically request the audit documents. For example, refer to the walkthrough section of the case flow and materials roadmap in Figure 2.

We recommend the course instructor outline the purpose and general expected outcome of each meeting before each meeting is to take place. The first in-class pre-meeting discussion should specifically include an initial introduction to the case materials, reading/discussion of the AICPA and IIA communication competencies, and a class brainstorming session of communication practices that would lead to a positive auditor/client relationship.⁵

As this case specifically involves an operational audit of a fixed assets process, students may benefit from performing a simple Internet search of what a fixed asset audit entails. Each in-class pre-meeting discussion should also include the purpose of the meeting (as defined by AICPA and IIA guidance), a review of the meeting checklist provided in Table 1, and a brainstorming session of how students can meet the communication competencies for that specific meeting.

Course instructors should then take appropriate time to debrief each meeting, and provide client feedback (see “Evaluation” below), after all audit teams have completed their meetings. Each in-class debrief should include a discussion of what went well during the meetings, what did not go well during the meetings, what students can improve upon for upcoming meetings, and their opinion if the meeting objectives were met.

To elevate the case across classes, instructors may allow audit teams to practice their conversations in class prior to their official engagement meetings as a sort of “dress rehearsal.” If time allows, clients may also allow audit team members to retry their conversations again, but with increased difficulty (e.g., more hesitant client, client withholding information, etc.).

⁴All case exhibits and evaluation materials can be obtained from the corresponding author, Gabriel Saucedo, at saucedog@seattleu.edu.

⁵AICPA and IIA competencies can be found at <https://www.aicpa.org/interestareas/accountingeducation/resources/corecompetency.html> and <https://global.theiia.org/about/about-internal-auditing/Pages/Competency-Framework.aspx>, respectively.

FIGURE 2. Case Flow and Materials Roadmap

Meeting	In-Class Pre-Meeting Discussion	Meeting Prep (Outside of Class)	Meeting Time	In-Class Debrief
Kickoff	60 minutes*	30 minutes	30 to 45 minutes	30 minutes
Auditor (Student) Materials		Client Materials		
Exhibit A	Fixed Assets Overview	Exhibit A	Fixed Assets Overview	
Exhibit 1	Kickoff Meeting Prep—Auditor	Exhibit A-1	Fixed Assets Detail—Client	
Other Notes				
<p>Given the Fixed Assets Overview and Fixed Assets Detail—Client materials, the client will primarily just respond to auditor questions during the kickoff meeting. To mimic a common audit kickoff meeting, we suggest that the client begin the meeting reluctantly (e.g., “We were just audited a few years ago, why do we have to do this again? We really don’t have time for this. What will we get out of this?”). At some point during the kickoff meeting, the client can also interrupt the auditor with an “important” phone call (i.e., set cell phone alarm so it goes off in the middle of the meeting).</p>				
↓				
Meeting	In-Class Pre-Meeting Discussion	Meeting Prep (Outside of Class)	Meeting Time	In-Class Debrief
Walkthrough	30 minutes	30 minutes	45 to 60 minutes	30 minutes
Auditor (Student) Materials		Client Materials		
Exhibit 2	Walkthrough Meeting Prep—Auditor	Exhibit B	Fixed Assets Capital Expenditure Plan & Budget Flowchart	
All other materials are the same as client (see right), but the auditor will only receive them if specifically requested from the client. If the auditors have failed to specifically request materials by the end of the walk-through meeting, we recommend the client give the auditors the missing materials and tell them why they would be important for a walkthrough.		Exhibit C	Fixed Assets Acquisition Process Flowchart	
		Exhibit D	Capital Expenditure Budget	
		Exhibit E	Capital Expenditure Purchase Requisition	
		Exhibit F	List of Authorized Vendors	
		Exhibit G	Purchase Order	
		Exhibit H	Receiving Report	
		Exhibit I	Fixed Assets Register	
		Exhibit J	Vendor Invoice	
↓				
Meeting	In-Class Pre-Meeting Discussion	Meeting Prep (Outside of Class)	Meeting Time	In-Class Debrief
Closing	30 minutes	45 minutes	30 to 45 minutes	30 minutes
Auditor (Student) Materials		Client Materials		
Exhibit K	Internal Audit Observations—Fixed Asset Acquisitions	Exhibit K	Internal Audit Observations—Fixed Asset Acquisitions	
Exhibit 3	Closing Meeting Prep—Auditor			
Other Notes				
<p>The observations list is provided to the client as a reference prior to the meeting, but it is up to the audit team to walk the client through the suggested operational observations, as well as any additional observations found by the audit team. The auditors may come up with additional observations other than the primary operational observations suggested, but the auditors should follow the format of discussing/categorizing the sub-process, observation, impact, recommendation, benefit, and risk rating. The auditors may also construct a comprehensive audit report at their own discretion, or at the request of the course instructor.</p>				

*As discussed in the “Implementation Guidance,” the first in-class pre-meeting discussion timing also includes: (1) the initial introduction to the case materials; (2) reading/discussion of the AICPA and IIA communication competencies; and (3) a class brainstorming session of communication practices that would lead to a positive auditor/client relationship.

TABLE 1. Audit Meeting Checklist

Reminders	Kickoff Meeting	Walkthrough Meeting	Closing Meeting
Purpose	The purpose of the kickoff meeting is to ensure that all audit team members and the client have a common understanding of the project and their roles. The auditors should introduce the purpose and benefits of the audit, outline the process under review, and gain rapport and build relationships with the client.	The purpose of a walkthrough meeting is to gain a clear understanding of the process under review. At each stage of the process, the auditor makes inquiries, observes activities, and examines completed documents and records.	The purpose of a closing meeting is to share with the client the audit findings and conclusions, ensure understanding and agreement with the results, and commit to a timeframe for remediation of audit findings. Auditors may also share recommendations regarding audit items that they did not elevate to an audit finding, but recognize as an area for improvement.
Meeting Checklist	Before	<ul style="list-style-type: none"> • Learn about the account/process. • Identify key client personnel. • Agree on meeting time and date. • Secure meeting room. • Send agenda to client. 	<ul style="list-style-type: none"> • Identify key client personnel. • Agree on meeting time and date. • Secure meeting room. • Send agenda to client.
	During	<ul style="list-style-type: none"> • Select a meeting note taker. • Introduce audit team to client. • Outline purpose/benefit of the audit. • Establish target timelines. • Establish communication protocols. 	<ul style="list-style-type: none"> • Select a meeting note taker. • Share findings and conclusions with client. • Provide recommendations. • Set a timeframe for remediation.
	After	<ul style="list-style-type: none"> • Distribute minutes/notes of meeting. 	<ul style="list-style-type: none"> • Distribute minutes/notes of meeting. • Follow up on remediation items.

Evaluation

At the conclusion of each meeting, the client evaluates the audit team across a series of metrics and provides both quantitative and qualitative feedback to the course instructor. The skills listed for evaluation map directly to IIA (2013) and AICPA (2017) core communication competencies. Instructors may choose to scale these evaluations into a formal grading rubric, but we used the client feedback as a way to inform and educate students, giving full case points for showing effort and contribution to the audit team.

Audit teams should witness increased composite scores across all three meetings as their oral and written communication skills develop, regardless of the fact that each meeting has a different purpose. We also encourage clients to give audit team members informal feedback at the end of each meeting (e.g., “You did XXX really well.” or “You may have considered asking for ZZZ document at such time.”).

After the closing meeting, the client completes a final debriefing questionnaire (following Trotman, et al., 2005) in order to elicit feedback on their satisfaction with the audit process, the auditor/client relationship, and overall auditor/client communications.⁶

CLASSROOM VALIDATION AND STUDENT FEEDBACK

Learning metrics from our case were collected using various methods to obtain evidence regarding case efficacy. The case was piloted with 45 students across 2 separate classes at the home institution of the co-authors, which is a highly

⁶Each auditor completes a similar debriefing questionnaire as described in the following “Classroom Validation and Student Feedback” section.

ranked university in the Pacific Northwest United States.⁷ All students completed pre- and post-case questionnaires to provide direct evidence of learning from the case materials.

One week prior to the first ABC Inc. meeting (i.e., the kickoff meeting), students were given a self-assessment directly related to the case learning objectives documented in the previous section. The pre-assessment was given with no discussion regarding the details or logistics of the ABC Inc. case at that point in the curriculum.

Upon completion of the case, all participating students were given a similar follow-up post-case assessment. On the 5-point Likert-type scale, students self-assessed a nearly 30% increase in communication ability (statistically significant with $t = 2.22$; $p = 0.017$).⁸

In additional untabulated results, 81% of students indicated that they learned a lot from the case, 88% enjoyed working through the case materials, and 81% would recommend the case be used in future courses at their university, as well as other universities. Furthermore, 81% of students found the case difficulty appropriate for their level of education and experience. Students also indicated:

1. They felt pushed outside of their normal comfort zone with the ABC Inc.
2. They thoroughly enjoyed and appreciated the opportunity to work through the case with actual audit professionals (role-playing the fixed asset manager).
3. The ABC Inc. case gave them the experience of working as part of an audit-like engagement team.

The consistent note for improvement for future uses of the case was to allot as much time as possible to reviewing the documents and correspondence of ABC Inc. before each meeting in class. This may be of specific importance to those students that may not have had an audit internship, or perhaps not even taken an audit class. Once students understood the scope and content of the documents, they were very motivated to proceed with their client meetings.

CONCLUSION

Communication skills are one of the most sought after employee talents in the field of accounting, but also one of the hardest behavioral skill sets to learn. The Institute of Internal Auditors specifically notes that communication skills can be harder to assess and develop than technical skills, and that the proper development of communication skills requires a different mix of classroom teaching, on-the-job experience, and continued coaching (IIARF, 2015).

Employers recognize that communication skills are integral to an accountant's competency set, and such skills give an accountant the ability to, first,

⁷Appropriate internal review board (IRB) approval was obtained for data collection.

⁸Students were asked to assess their confidence in both oral and written communication skills, ability to prepare for audit meetings, ability to evaluate and synthesize accounting information, ability to design and deliver action plans, and attainment of the proper oral and written communication skills to conduct a thorough, informative, and value-added audit.

apply technical knowledge, and then communicate what has been applied to stakeholders (IIARF, 2015; Ovaska-Few, 2017). As the accounting profession moves toward a higher proportion of risk-based auditing, as well as more advisory and consultative work, accountants will need to have a solid base of both oral and written communication skills.

The purpose of this case is to give students—future accounting professionals—the opportunity to build their oral and written communication skills in a setting that closely mimics a real-world scenario between an auditor and a client. Working as an audit team, students coordinate all communications for three separate meetings with an audit client, including a kickoff meeting, a walkthrough meeting, and a closing meeting.

During each meeting students demonstrate different effective communication techniques to achieve the goals of that specific meeting, but also the goals of the overall audit. Initial feedback and efficacy measures indicate that upon completing this case, students did in fact increase their communication abilities, as measured through self-assessment and third-party evaluations.

Furthermore, students overwhelmingly signaled that they learned a lot from the ABC Inc. case, found the case enjoyable and interesting, and would recommend the ABC Inc. case to students at other universities.

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Rehiring the Retired: An Examination of Double Dipping in Public School Districts

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Abstract

This study provides a data analysis to identify the prevalence of double dipping in the New York State education system. Pension data, earnings in retirement, and hand-collected governance data are used in the statistical analyses. Collectively, and to our knowledge, these data sources have not been used in prior school district research. Findings from the univariate and cross-sectional analyses used to explore the association between school-board governance characteristics and double dipping suggest that the presence of budget committees, superintendent tenure, and school-board size may impact decisions to rehire retirees. This research contributes to the extant literature by providing the first comprehensive study of the economic impact of double dipping. School district administrators and state regulators may find the analysis helpful for evaluating decisions to hire recent retirees to fill school district vacancies and for evaluating policy implications to preserve the integrity of government pension plans.

INTRODUCTION

This study provides a data analysis to identify the prevalence of double dipping among certified staff in school districts in the New York State (NYS) education system, which includes teachers and superintendents of education. Relationships between double dipping and governance characteristics are also examined.

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Double dipping occurs when a public-sector employee is simultaneously receiving a retirement pension and actively working and drawing a salary funded from the same system, or in some cases, the same employer within that system. Double dippers retire to receive their pensions and are then rehired, sometimes after only a short waiting period, and paid a salary, resulting in the retired employee receiving double pay. This employment scenario may be interpreted as taxpayers paying twice for the services of the same individual. In spite of this view, double dipping is legal and is a common practice among public-sector employees. We explore the prevalence of double dipping and the pros and cons associated with this practice.

The pension data used in this study covers the years 2008 through 2013 and was collected using publicly available data. Survey instruments and information through FOIL requests from school districts were used to obtain school district governance characteristics that existed at June 30, 2010. Univariate and cross-sectional regression tests were used to determine whether the presence of governance characteristics is associated with the use of long-tenured temporary employees in New York State.

This paper contributes to the literature as the first study to report and analyze the economic effects of double dipping in NYS, to the best of the authors' knowledge. Specifically, we evaluate the following research questions:

1. To what extent are school districts in NYS engaging in the practice of double dipping?
2. What relationships exist between the number and cost of double dipping events and governance characteristics of school district boards of education in NYS?

The results show that employment positions assumed by retirees appear to be long term, and the rehired retirees earned significant compensation while simultaneously collecting pension benefits from the same employer, New York State. Further, school district governance characteristics, such as tenure of the superintendents of education and of business and budget committee oversight, do matter with respect to retiree earnings.

The paper is organized as follows:

- Background
- Research Methodology
- Results of the Statistical Analysis
- Summary and Conclusions

BACKGROUND

Double Dipping

The practice of double dipping is a widespread, national phenomenon. A retired school superintendent in Illinois who serves as president of a public boarding school receives a combined \$410,000 each year in pension payments (\$184,000) and salary (\$225,900). In a Michigan school district, 10 administrators retired, started drawing pension checks and immediately returned to work as contract

employees. The executive director at a state agency in Texas is receiving a \$123,000 annual salary while receiving a government pension for the past eight years (Associated Press, 2011). According to *USA Today* (December 3, 2009), states identified thousands of double dippers at the same time the nation's state and local retirement systems lost about \$800 billion (Heath, 2009). The *Seattle Times* reported on two top employees who had "retired" for a mandatory 30-day waiting period and then immediately returned to work. Their desks were never cleaned out and their positions were not advertised, suggesting there was never any intention of retiring. Upon rehire, both employees were collecting sizable pensions in addition to their \$100,000 annual salaries (Sostek, 2003).

These are just a few examples of the state and public school employees across the country who are double dipping, drawing taxpayer-funded paychecks along with their pensions. At least 66,000 of these double dippers are in five states alone, California, New York, Texas, Florida, and Michigan. Data reviewed by the Associated Press revealed that, in 2010, more than 11,100 school retirees in Michigan simultaneously received pension payments totaling \$227 million and salaries totaling \$71 million, and double dipping continued to be pervasive even after a law limiting the practice took effect in July 2010. More than 12,500 workers in government or public education jobs in Florida received pensions totaling nearly \$232 million in addition to their annual salaries. In Texas, more than 6,100 state government employees were receiving salaries, plus \$145 million in pensions. Double dippers comprised about 10 percent of the employees in four Texas state agencies (Associated Press, 2011). One additional example from New Jersey includes a superintendent of education, who after retiring at age 56, held 23 jobs as an interim superintendent at public school districts in eight different counties, drawing six-figure salaries from taxpayers along with \$1.4 million in state pension checks (Lagerkvist, 2013).

This study addresses double dipping in one segment of local government, school districts, and focuses on data from NYS and Long Island (LI). The primary and secondary education systems in LI are funded through property taxes paid by homeowners and businesses, and LI property taxes are among the highest in the country.¹ Nassau County, one of two counties that comprise LI, is ranked second of the 3,143 counties in the United States based on median property taxes. The median annual property tax in Nassau County is \$8,711 for a home worth the median value of \$487,900. The average property tax paid by Nassau County residents represents approximately 8.26 percent of their annual or yearly income (see http://www.tax-rates.org/new_york/nassau_county_property_tax).

The magnitude of taxpayer dollars involved underpins the importance of examining double dipping. We focus this study on certified staff because most double dippers come from this category of employees as it requires the highest level of skill sets and thus absent skill sets when these school district professionals retire. Certified staff not only includes teachers, but also the superintendent of education, who serves as the "CEO" of a school district.²

¹Approximately two-thirds of property tax bills represent public school taxes.

²As an example of that skill set, in NYS to be certified staff requires a series of examinations for certification. The tests measure knowledge and skills in the liberal arts and sciences, in teaching theory and practice, and in the content area of the certificate title. See <http://eservices.nysed.gov/teach/cerhelp/ReqDescription.do%3FmetaValueId%3D205%26crcId%3D19> for description of certification requirements.

School district superintendents are among the highest-paid government employees in the country, earning significantly more than teachers, state governors, and the President of the United States. This rising pay is in the backdrop as school districts face declining enrollments, decreased funding, and declining academic performance. According to the Bureau of Labor Statistics Occupational Employment Statistics, the Nassau-Suffolk, NY Metropolitan Division has the highest annual compensation of elementary and secondary education administrators in the United States.³

The system of allowing school districts to rehire retirees is intended to help districts fill key vacancies with experienced teachers and administrators as they search for permanent replacements. This is common practice among school districts. The laws governing this practice are referred to as “retire-rehire” laws and have been enacted in many states to avert or resolve the problem of teacher and administrator shortages in school districts. At their best, retire-rehire laws work as a powerful tool to attract qualified retirees back into the workforce to fill critical shortages or to address unexpected vacancies. At their worst, the laws may encourage exploitation of the system (Sostek, 2003).

Although working in retirement is not unusual in the public and private sectors, the practice of double dipping in the public sector is questioned when it occurs in a single state system that is funded by taxpayers. The economic impact of double dipping manifests itself as a financial burden born by the taxpayer, who appears to be paying double for the same output. Furthermore, as noted previously, there have been examples that indicate an intention to retire in form, but not in substance.

New York State has seen its fair share of double dipping controversy. In 2008, an investigation was launched into double dipping practices in LI school districts, the purpose of which was to determine whether double dippers were engaging in fraudulent activities and to “shine a light on questionable employment practices” in school districts. The investigation was subsequently expanded to include all 685 school districts in NYS and triggered new legislation targeted to reduce double dipping.⁴

Then Attorney General Cuomo’s ongoing investigation of pension fraud had already revealed that many lawyers remained on school districts’ or Boards of Cooperative Educational Services (BOCES) payrolls for extended periods of time, or were included on the payrolls of so many school districts or BOCES simultaneously, that they accumulated substantial credits in the New York State Employees’ Retirement System.

As awareness of the prevalence and financial and social impact of double dipping increases, state lawmakers have implemented measures to curb the practice of exploiting pension systems. Measures differ from state to state and include bans on double dipping, lengthy waiting periods before retirees can return to work, and limits on how much of their pensions retired employees can receive if they return to work (Heath, 2009; Associated Press, 2011; Lagerkvist, 2013). Other approaches include requiring evidence of a shortage before a retiree is rehired (Sostek, 2003) and imposing an excise tax on double dipping

³<http://www.bls.gov/oes/current/oes119032.htm>

⁴See <https://ag.ny.gov/press-release/attorney-general-cuomo-expands-double-dipping-investigation-every-school-district-new>

compensation to curb the practice (Miller, 2009). To curb the exploitation of the retirement system, some states have simply repealed their retire-hire laws, including Louisiana and New Hampshire (Sostek, 2003).

New York State has also taken steps to address the issue of double dipping. In 2008, bill S.8669 was signed into law. This legislation curbs double dipping in the state-pension system, and requires school districts to disclose employees who are simultaneously receiving a NYS pension under various waiver restrictions permitted by law. The law makes clear that retired persons can only be hired in certain circumstances and then only temporarily until a qualified non-retiree is identified to fill the permanent vacancy. In addition, retired government workers under age 65 who return to public employment in New York are no longer permitted to receive pension payments when their annual earnings reach \$30,000. Despite this law, 2,345 retirees were on the state payroll and received pensions as of May 2011, according to data compiled by the state comptroller. A new centralized tracking system will be used by the New York Comptroller Thomas DiNapoli to monitor compliance with legal regulations and “shut off what he believes is a major avenue for fraud” (Associated Press, 2011).

The Debate

At the root of the double dipping issue is the fundamental definition of retirement. Retirement has traditionally been perceived as permanently ending one’s working or professional career. The practice of double dipping is contrary to this definition of retirement, suggesting that a new paradigm may be emerging.

Proponents of double dipping argue that property taxpayers benefit when a retiree is rehired because the experienced retiree fills an immediate critical personnel need at a lower cost, saving on health and retirement benefits, which are not part of the rehiree’s compensation package. Proponents also argue that as long as employees have reached retirement age, they have earned their pensions and should be able to draw on those funds regardless of subsequent employment status. Others view pensions as deferred compensation that is the right of entitlement to the earner at any age. Regardless, because the practice of double dipping is legal and allowable, retirees may interpret this as permission to simultaneously collect a pension and a salary. In fact, in the NYS retirement handbook, candidates are encouraged to take advantage of double dipping.⁵

Opponents of double dipping view it as an unethical “gaming” of the system to increase compensation for the same level of productive output. The list of concerns related to double dipping far outnumbers the list of pros found in the literature. From a philosophical standpoint, opponents of double dipping argue that pensions were intended to provide retirement security and should, therefore, provide replacement income, not dual income (Miller, 2009). As such, pension systems should be used only after employees stop working for good. The fundamental philosophical issue is whether individuals who are perfectly capable of working should be allowed to collect pension benefits while simultaneously earning a salary. Finally, some may view double dipping as reducing employment opportunities for budding administrators.

⁵See <https://www.nystrs.org/NYSTRS/media/PDF/working.pdf>

The double dipping debate goes far beyond the differences discussed thus far. According to an article published by the Institute for Internal Auditors, there are two major risks of double dipping: negative actuarial impact and noncompliance with IRS pension rules (Knight, 2008). With respect to actuarial impact, the practice of drawing a pension while earning a salary puts a financial strain on public retirement plans. Public pension funds are *defined benefit plans* whereby future benefits are guaranteed by the employer or the system, which assumes the actuarial and investment liability associated with the plans. Most defined-benefit retirement plans were not designed to have participants who do not contribute and, therefore, have a negative impact on the fund's sound fiscal management (Knight, 2008). The argument rests in the fact that retired rehires draw from the system but do not contribute to the system and take the place of workers who otherwise would be paying into the system. People who retire early and take another government job are of particular concern as they draw pension income for many more years than they otherwise would. The pension system cannot afford to have people retire at an early age. State pension liabilities are already underfunded by almost \$700 billion (Associated Press, 2011).

Another risk of the retire-and-rehire practice lies in the IRS rules that determine who is eligible to receive pension payments from the often tax-exempt retirement funds. To be eligible to receive a pension, a retiree must have a true separation from service. The most important factor is *why* the retiree returns to work. The retiree's return must be for a reason "*unforeseeable at the time of retirement*" (Knight, 2008).

The practice of double dipping is essentially nonexistent in the private sector, whereby private-sector employees also pay taxes but do not have the same kind of benefits as the public sector (Gartner, 2011). Most retirement plans in the private sector are *defined contribution plans*, such as 401(k), 457, and individual retirement accounts, in which the amount of retirement benefits is directly related to individual contributions and investment performance. Future benefits are not guaranteed in defined contribution plans (Knight, 2008). In contrast, defined contribution plans in the public sector are not necessarily the norm. This begs the question, if private entities limit double dipping, why do government agencies seemingly find utility from it? The rehiring is contrary to circumstances when retirees are rehired in the corporate sector; that is, retirees are incentivized to minimize the interim employment period to avoid negative market reaction (Clayton, Hartsell, and Rosenberg, 2005); double dipping in the corporate sector is considered poor governance. Regardless, rehiring a retiree in the public sector comes at the expense of taxpayers who are simultaneously not only funding pensions, but also the salaries of retirees. Now that the retirement paradigm is shifting, and with taxpayers paying the bill, lawmakers must evaluate the impact of this shift and adjust to the new reality in order to preserve and protect pension funds on which retirees rely.

NYS Teachers Retirement System

NYS Teachers Retirement System (TRS) is built on tiers. The best tier for those employees is Tier 1, as that tier did not require employee contributions. Throughout the years, NYS has tightened up the tiers by increasing the vesting period and/or requiring an increasing contribution. Today, Tier 6 employees are required to

TABLE 1. Teachers Retirement System

Tier	Hire Date	Vesting	Mandatory Contribution	Withdrawals May Start	Prior Service Cost
1	Before 7/1/73	5 years	None, voluntary contributions	At 55; 5 years of service or 3 years + 2 credits	Cost free
2	7/1/73 to 7/26/76	5 years	None, voluntary contributions	At 55 with 5 years of service	Cost free
3	7/27/76 to 8/31/83	5 years	3% of salary for 10 years	At 55 with 5 years of service	3% of salary
4	9/1/83 to 12/31/09	5 years	3% of salary for 10 years	At 55 with 5 years of service	3% of salary plus higher interest %
5	1/1/10 to 3/31/12	10 years	3.5% of reportable salary	At 55 with 10 years of service	3.5% of salary
6	After 3/31/12	10 years	3% to 6%; salary cap at \$179K	At 55 with 10 years of service	6% of salary

Source: Active Members Handbook found at <https://www.nystrs.org/NYSTRS/media/PDF/Library/Publications/Active%20Members/handbook.pdf>

make a contribution toward their pension based on a progressive scale that is subject to a contribution limit of six percent of a maximum salary of \$179,000, which is the governor's salary.

All participants in this system are eligible for retirement at age 55. Tier 1 through 4 members may retire at age 55 with five or more years of service. (For Tier 1, retirement may also occur at age 55 with less than five years of service, if two years are credited since age 53.) Tier 5 and 6 members may retire at age 55 with 10 years of service credit. NYS tax law §612 Article 22 ¶ c (3) does not impose income taxes on pensions received from NYS pension systems for NYS residents.

Table 1 summarizes the highlights of each tier.

According to the TRS Active Members Handbook for future retirees, double dipping is encouraged by stating, "While working in retirement may seem like a contradiction, it can be a rewarding and profitable experience. Whether it's to help offset rising costs or to satisfy a need to be connected and productive, returning to the workplace has become commonplace." The handbook further describes the current NYS law that delineates requirements and limitations for earning while "retired." A summary of that law is described in the Table 2.

Interim Leaders and Performance

There are parallels in the for-profit sector, and research is available to support the thesis that extended interim employment may not be economically beneficial to an organization. Succession planning is an essential element of good corporate governance (Ballinger and Marcel, 2010).⁶ A change in leadership occurs when a manager departs voluntarily or involuntarily. In the for-profit sector, the New York Stock Exchange (NYSE) requires that firms have a succession plan in place.⁷

In the case of a voluntary departure, such as retirement, announcements are made four to six months prior to departure. However, involuntary departures occur with little or no notice. When a CEO⁸ departs voluntarily, the event has no impact on share price. However, in the case of involuntary turnover, there

⁶Succession planning is one of the minimally acceptable corporate governance standards based on Institutional Shareholder Services (ISS), Corporate Governance: Best Practices User Guide and Glossary, 2003. Numerous prior empirical studies focus on succession planning as a desirable corporate governance characteristic (Borokovich, Parrino, and Trapani, 1996; Hermalin, 2005).

⁷"Succession planning should include policies and principles for CEO selection and performance review." NYSE Listed Company Manual, Section 303A09.

⁸We make the comparison of superintendents in the local government to CEOs in the for profit sector.

TABLE 2. Earnings in Retirement According to §211 and §212 of NYS Retirement and Social Security Law

Type of Work	Prior NYS Approval	Earnings Limit	Other
Temporary or Occasional	No	\$30,000 as of 1/1/2013	Exceeding earnings limit requires pension benefit repayment.
Regular, Full-Time Contractual	Yes	None, unless same prior employer	Under Section 211, a retired public employee is prevented from working in the same or similar position for one year from the retiree's date of retirement from a New York State public retirement system. Approvals are generally limited to one year.
Consulting	Yes, subject to contract approval.	Yes, if retired joined NYSTRS on or after May 31, 1973. Section 212 earnings limit applies.	A consultant cannot perform a function that would be performed by a teacher/administrator in the district.
Extended Period (Full-Time) Contractual for More than Two Years	No, but must suspend pension benefit.	None, if pension benefit is suspended. Otherwise the Section 212 earnings limit applies.	After 2 years, pension benefit qualifies for recalculation or additional benefits.
65 or Over	No	Unlimited	

is a negative reaction to the announcement. There is a degree of uncertainty regarding the future strategic direction and the successor CEO's ability after a CEO turnover (Clayton, Hartsell, and Rosenberg, 2005).

Empirical research reports that an interim CEO is most frequently employed following an involuntary turnover in the event a permanent successor has not been named. The average term of an interim CEO is 195 days (Ballinger and Marcel, 2010). According to Ballinger and Marcel (2010), an interim CEO is one where the title of chief executive officer is vacated by the incumbent and the board of directors has not announced a permanent successor, and designates a particular individual as "interim CEO," or "acting CEO," or "CEO until a permanent successor is named." Based on their empirical data, Ballinger and Marcel (2010) conclude that the use of an interim CEO during successions is an inferior post hoc fix to succession planning processes that boards of directors should avoid. Temporary employment is not extended in the for-profit sector as we have witnessed in the government sector because shareholders do not tolerate the negative economic effect of interim leadership.

RESEARCH METHODOLOGY

The primary objective of this study is to gain a further understanding of the prevalence and economic impact of school district retirees employed by school districts during retirement from 2008 through 2013. A second objective of this study is to evaluate governance structures and academic outcomes for the LI school districts that have earning retirees. LI school districts represent approximately 20 percent of all NYS school districts. The research questions addressed are:

1. To what extent are school districts in NYS engaging in the practice of double dipping?

2. What relationships exist between the number and cost of double dipping events and governance characteristics of school district boards of education in NYS?

Retiree Pension and Retiree Earnings Data

Pension data for school district certified staff was obtained from the See Through NY website found at <http://seethroughny.net/pensions/>. School district retiree earnings while employed by school districts were obtained through a Freedom of Information Law (FOIL) request from the Coordinator of Public Information of the New York State Teachers' Retirement System. Note that retiree earnings reflect only W-2 earnings and exclude amounts earned on a consulting basis. The data years are 2008 through 2013. The earlier year represents the oldest year provided by See Through NY.

Survey Instrument for Governance Data and Academic Data

Each LI school district was surveyed. This sample district was chosen out of convenience for data accessibility. Although according to NYS Office of the Comptroller, there are 126 school districts on LI, all but three districts (New Suffolk Common School District, Sagaponack Common School District, and Wainscott Common School District) are required to report to NYS and were included in the survey. For the purpose of this study, 80 percent of the school districts surveyed responded to either the voluntary or FOIL request.⁹ These districts form the basis for the governance structure analysis.¹⁰

While governance data for private-sector firms are readily available through numerous electronic databases¹¹, similar data are not readily available for school districts, even though those characteristics are just as vital as they are in the private sector (Ballinger, Fulbright, and Zimmerman, 1997; Resnick and Seamon, 1999). Therefore, we had to hand collect the governance data. The governance variables used in the study were obtained from survey responses and represent structures that existed as of June 30, 2010.

According to the private sector literature, Yermack (1996) finds that smaller boards are more efficient, and Jensen (1993) suggests that when boards get beyond seven or eight people, they are less likely to function effectively. According to the public-sector literature, there is some evidence that public sector boards are not always effective. Danzberger, et al. (1987) and Danzberger (1994) find school-board governance problems, such as micromanaging, role confusion, and pursuit of individual board member political aspirations.

The Board of Education plays a critical role in the governance of school districts. "Who sits on the board, will, in turn, affect the various strategic decisions made by the board and how effectively the board carries out its functions" (Dey

⁹Districts were first asked to voluntarily respond to the survey. After repeated requests from non-responding districts, a FOIL request was sent. Not all districts responded to the FOIL request; some citing the information requested was not found in an existing record as defined by NYS Committee on Open Government and, therefore, compliance with the FOIL request was not required. See <http://www.dos.state.ny.us/coog/foil2.html>

¹⁰Although 80 percent of school districts responded, not all survey data was usable.

¹¹For example, Audit Analytics and Compustat Executive Compensation databases.

and Liu, 2011, p. 2). An essential school-board responsibility is to allocate the financial resources to improve academic performance. The board executes its financial responsibilities through oversight of the annual budget process. As school districts enhance their governance through oversight mechanisms, such as optimizing board size and creating a board-designated budget committee, they have increased oversight of spending initiatives, including the decisions to hire retirees.

The survey determines the tenure of not only the Board of Education, but also school administration. The superintendent plays a central and critical role in school district governance and can exert substantial influence on the board. According to Geddes and Vinod (1998), CEO tenure is particularly important because lengthy tenure is associated with CEO entrenchment, which negatively affects the organization. Similarly, we include a variable that measures the influence of the superintendent of business, who is responsible for oversight of the resources for every aspect of the school district, in particular payroll, which is the most significant component of a school district's budget. The survey captures school district governance characteristics that are not publicly available, and these variables are included in our statistical analysis. To control for variation of school district quality, we include student-to-teacher ratio, as it has been used in previous empirical studies as a measure of school quality (e.g., Card and Krueger, 1992). Student-teacher ratios, determined from data disclosed on school district report cards found at <http://data.nysed.gov/>, were used.

Statistical Tests

Summary statistics were used to determine the prevalence and magnitude of school district retiree earnings and employment positions secured while receiving a pension from the NYS certified staff retirement system. Univariate and cross-sectional analyses were used to examine the association between retiree earnings and employment positions and school district governance and academic characteristics. The White test was used to determine heteroscedasticity, which is found in cross-sectional datasets, and thus White T -statistics are presented as indicated by the White general test. Durbin-Watson tests were examined to identify autocorrelation issues and variance inflation factors were examined to test for multicollinearity. The cross-sectional model is described as follows:

$$\text{Grand_Total } \$_{j} = \beta_0 + \beta_1 (\text{Trustees }_{j}) + \beta_2 (\text{BOE Tenure }_{j}) + \beta_3 (\text{Budget Committee }_{j}) + \beta_4 (\text{Sup Tenure }_{j}) + \beta_5 (\text{Bus Tenure }_{j}) + \beta_6 (\text{Student:Teacher }_{j}) + \varepsilon \quad [1]$$

and

$$\text{Total Events }_{j} = \beta_0 + \beta_1 (\text{Trustees }_{j}) + \beta_2 (\text{BOE Tenure }_{j}) + \beta_3 (\text{Budget Committee }_{j}) + \beta_4 (\text{Sup Tenure }_{j}) + \beta_5 (\text{Bus Tenure }_{j}) + \beta_6 (\text{Student:Teacher }_{j}) + \varepsilon \quad [2]$$

Where:

Grand Total \$ is the log value of retiree school district earnings while receiving a pension from school district j ¹²

¹²School district fiscal year ends on June 30.

Total Events is the log value of the number of post-retirement employment positions retirees occupied while receiving a pension benefit

Trustees is the number of board members for school district j

BOE Tenure is the average length of years served on the board of education by all board members for school district j as of June 30, 2010

Budget Committee is equal to 1 if the school district reported the use of a budget committee, 0, else for school district j as of June 30, 2010

Sup Tenure represents the number of years that the superintendent of education has been in office for school district j as of June 30, 2010

Bus Tenure represents the number of years that the superintendent of business has been in office for school district j as of June 30, 2010

Student:Teacher is the change in ratio of students to teachers for school district j from 2008 through 2013

RESULTS OF THE STATISTICAL ANALYSIS

Prevalence of Double Dipping

Table 3 presents the pension and retiree compensation on a retiree level and contains five panels. Panel A presents the compensation and retirement data for all NYS retirees. Pension benefits paid to all NYS retirees who were earning a salary in school districts during retirement totaled \$4.2 billion during the years 2008 through 2013, which represented approximately 13 percent of pension benefits paid to all NYS retirees considered certified staff. Earning retirees represented 10 percent of all retirees, similar to the findings in Texas reported earlier, and were engaged in 95,803 employment opportunities. NYS retirees earned compensation of \$675.9 million, or approximately 16 percent of their pension benefits, for a total of \$4.9 billion in pension benefits and compensation.

Panel B reports on the prevalence of double dipping on LI where earning retirees received \$877.7 million in pension benefits while earning \$128.2 million in salaries, representing approximately 21 percent and 19 percent of total NYS earning retirees' pension benefits and retirement compensation, respectively. There were 12,416 earning retirees, who represented nearly 15 percent of all NYS earning retirees and who were engaged in 13,571 employment opportunities. Total pension and compensation remuneration for LI earning retirees was \$1.0 billion over the 6-year period.

Panel C reports LI "top" retirees earning in retirement. "Top" retirees are defined in this study as earning more than \$50,000 in any of the years under review, while simultaneously receiving a pension benefit. A more detailed analysis is presented for the top six earning retirees, each of whom were collecting pensions from more than one school district. As an example, employee "B" is receiving five pensions from NYS agencies (mostly school districts) for a total of \$1.4 million in pension benefits and simultaneously earned \$140,238 from four different school districts during 2008 to 2013. The top six earning retirees demonstrate the ability to receive multiple pensions while being simultaneously employed in multiple salaried positions.

TABLE 3. Prevalence of Double Dipping, 2008 to 2013

Panel A. All New York State School Districts

Retirees Working in Retirement Only-Certified Staff Only- All NYS					All Retirees	
Aggregate Data						
Year	Pension Benefit	Earnings in Retirement	No. of Job Events	No. of Retirees	All Pension Benefits	No. of Retirees
2008	\$645,733,371	\$108,051,224	15,181	13,206	\$4,941,978,408	131,550
2009	\$671,686,917	\$111,616,724	15,657	13,554	\$5,169,561,035	134,464
2010	\$661,481,899	\$107,069,770	15,233	14,202	\$5,319,259,490	135,668
2011	\$741,143,735	\$116,796,750	16,641	14,431	\$4,330,717,909	142,080
2012	\$742,096,063	\$114,537,820	16,652	14,372	\$5,976,718,932	145,130
2013	\$739,162,377	\$117,784,270	16,439	14,234	\$6,159,128,173	147,515
Totals	\$4,201,304,361	\$675,856,558	95,803	83,999	\$31,897,363,946	836,407

Panel B. Long Island School Districts

Retirees Working in Retirement Only-Certified Staff Only				
Year	Pension Benefit	Earnings in Retirement	No. of Job Events	No. of Retirees
2008	\$117,779,329	\$20,678,943	2,316	2,110
2009	\$144,898,074	\$20,580,543	2,242	2,042
2010	\$145,532,688	\$20,518,323	2,188	1,983
2011	\$159,921,089	\$22,080,834	2,353	2,149
2012	\$153,378,646	\$21,573,432	2,226	2,046
2013	\$156,232,828	\$22,787,016	2,246	2,086
Totals	\$877,742,654	\$128,219,091	13,571	12,416

Panel C. Top Long Island School District Double Dippers (earning > \$50,000 in retirement during 2008 to 2013)

Top 6 Double Dippers	Employee	No. of NYS Employers/Pensions	Pension	Earnings in Retirement	Employment Events in Retirement
	A	2	\$222,374	\$53,333	1
	B	5	\$1,429,482	\$140,238	4
	C	2	\$841,176	\$61,125	2
	D	2	\$518,796	\$406,937	5
	E	2	\$518,796	\$94,400	1
	F	2	\$955,152	\$147,571	4
Total Top Double Dippers (> \$50,000)	108		\$59,893,162	\$34,083,333	408
All Double Dippers	4,343		\$877,742,654	\$128,219,091	13,571

(continued)

TABLE 3. Prevalence of Double Dipping, 2008 to 2013 (*continued*)

Panel D. Frequency of Tenure of Top Long Island School District Double Dippers (earning > \$50,000 in retirement during 2008 to 2013)

Number of Years (Upper Limit) at "Temporary" Position in a Single SD	Frequency
1	60
2	28
3	15
4	9
5	4
6	9
<i>Total No. Events</i>	125
Mean Length of Stay at One Employer While Receiving Pension Benefits	2.168 years*

* Mean length of stay at one employer while receiving pension benefits was calculated by dividing the total number of years a "retiree" held a temporary position in a particular school district by the total number of events (number of post-retirement employment positions occupied by "retirees" receiving pension benefits—individuals working for more than one school district are counted once for each school district position).

Panel E. Definition of Variables

Trustees is the number of board members for school district *j* as of June 30, 2010

BOE Tenure is the average length of years served on the board of education by all board members for school district *j* as of June 30, 2010

Budget Committee is equal to 1, if the school district reported the use of a budget committee, 0, else for school district *j* as of June 30, 2010

Sup Tenure represents the number of years that the superintendent of education has been in office for school district *j* as of June 30, 2010

Bus Tenure represents the number of years that the superintendent of business has been in office for school district *j* as of June 30, 2010

Student: Teacher is the change in ratio of students to teachers for school district *j* during 2008 through 2013

Total Events is the log value of the number of post-retirement employment positions retirees occupied while receiving a pension benefit

Panel C also discloses that 108 earning retirees received pension benefits of \$59.9 million and earned \$34.1 million from 408 employment opportunities. The "top" earning retirees received pension benefits and compensation representing 6.8 percent and 26.6 percent of all LI earning retirees, respectively, while only engaged in three percent of LI retiree employment opportunities.

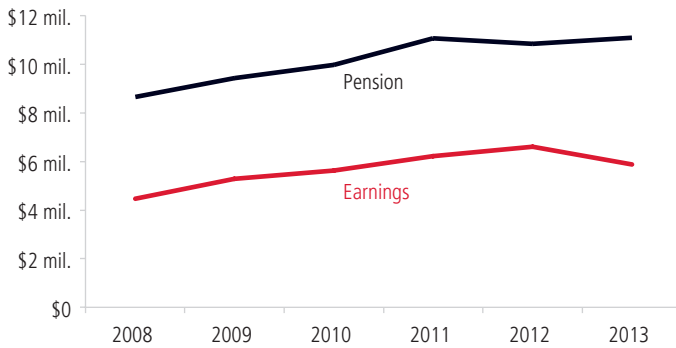
Panel D presents the tenure data for employed retirees. Unlike interim CEOs in a for-profit organization (Ballinger and Marcel, 2010), the average length of stay for an employed retiree is 2.168 years. The data also reflect that over 50 percent of the employment events lasted longer than one year.

Table 3, Panel E presents our variable definitions.

Figure 1 presents total pensions plus total earnings for Top Double Dippers by year. The blue (top) line is the pension and the red (bottom) line is their salary in retirement. Although double dippers are earning in retirement, their pensions are higher than their post-retirement earnings, which are lower than their pre-retirement salaries (see Figure 1).

Statistical Analysis

Table 4 presents the summary statistics for the LI school districts. The data are presented on a school district level. The maximum amount of compensation paid to all retirees during 2008 to 2013 (Grand Total) was \$4.3 million and

FIGURE 1. Top Double Dippers

a mean value of \$1.1 million. The significant standard deviation indicates much dispersion in the data. The maximum number of employment opportunities provided by districts (Total Events) was 527; that is, one school district provided 527 employment positions to retirees over the 6-year period. The mean number of employment positions provided to retirees was 112. Similar to retiree compensation, the significant standard deviation of 102 job events indicates dispersion in the data. As of June 30, 2010, the average number of trustees on the board of education was six, and trustees served on the board for approximately five years

on average. Approximately 42 percent of the districts that responded to the survey made use of a budget committee, and the tenure of the superintendents of education and of business had very similar average years of service of 5.0 and 4.4 years, respectively. During the years under analysis, the change in the student-teacher ratio declined to a mean of (0.047), suggesting fewer students per teacher.

Table 5 presents the regression results for the analysis of the associations between the earnings and job opportunities in retirement and governance and academic outcomes. In the first model, where the log value of retiree compensation (Grand Total \$) is the dependent variable, use of a budget committee and the tenure of the superintendent of education are both positive and significant at levels $p < 0.010$ and $p < 0.001$, respectively. The tenure of the business superintendent is negative and significant at $p < 0.010$. In the second model, when the dependent variable is the log value of employment positions provided in retirement (Total Events), the number of trustees, budget committee use, and the tenure of the superintendent of education are positive and significant at $p < 0.0001$, 0.010, 0.0001, and 0.050, respectively. Similar to results found in model 1, the tenure of the business superintendent is negative and significant at $p < 0.050$. In model 2, the student-teacher ratio is positive and significant at $p < 0.050$, suggesting that improvement in this ratio (mean is negative) is associated with hiring seasoned retirees. Overall, for both models, budget committees and the

TABLE 4. Summary Statistics, Long Island School Districts

Variable	N	Minimum	Maximum	Mean	Std. Dev.
Grand Total	121	\$4,500	\$4,293,597	\$1,059,662	\$972,068
Total Events	121	1.000	527.000	112.157	102.275
Trustees	98	3.000	9.000	6.122	1.204
BOE Tenure	94	1.429	17.800	5.393	3.321
Budget Committee	98	-	1.000	0.418	0.496
Sup Tenure	98	0.417	24.000	5.040	4.747
Bus Tenure	87	-	20.000	4.376	3.618
Student:Teacher	120	(0.269)	0.142	(0.047)	0.059

See Table 3, Panel E for definition of variables.

TABLE 5. Regression Results, Long Island School Districts

	Grand Total \$	Total Events
Intercept	5.532*** (30.340)	1.3071*** (8.540)
Trustees	0.039 (1.450)	0.1035*** (4.770)
BOE Tenure	-0.004 (0.610)	-0.0089 (1.610)
Budget Committee	0.175** (2.930)	0.1368** (2.870)
Sup Tenure	0.027*** (3.600)	0.0156*** (3.930)
Bus Tenure	-0.025** (3.460)	-0.0121* (2.040)
Student:Teacher	0.542 (1.210)	0.9124* (2.390)
N	83	83
F-Value	3.390	5.310
Adjusted R2	0.149	0.242

*, **, *** Statistical significance at $p < 0.050, 0.010, 0.0001$, respectively (2-tailed). T-values are in parenthesis.

See Table 3, Panel E for definition of variables.

superintendent of education may view the employment of retirees as beneficial for short-term budget planning purposes and to achieve better outcomes in the short-run; whereas the superintendent of business may find that such actions are more costly. Trustees on the board of education agree with the budget committee and superintendent of education with respect to employment of retirees, especially with respect to larger boards.

SUMMARY AND CONCLUSIONS

The depth of the rehired retirees was examined in terms of its proliferation and magnitude of double dipping compensation. Using governance data collected from LI school districts, we examine the relationships between double dipping and governance characteristics, such as number and tenure of board of education trustees, participatory budgeting through the use of a budget committee, tenure of the superintendents of education and business, and student-teacher ratio.

Despite measures to curb double dipping in NY and other states, the practice continues to persist. Temporary roles assumed by double dippers appear to be more permanent in nature because the average length of stay for an employed retiree exceeds two years (see Table 3 Panel D). Finally, the economic impact of double dipping is presented and is extensive, showing that NYS school district retirees collected \$4.2 billion in pension benefits while simultaneously earning \$676 million in salaries from the same employer. Governance characteristics may have an impact on a district's decisions to rehire retirees, particularly the presence of budget committees and the tenure of the superintendent of education and the superintendent of business. The results suggest the size of the board may also be a relevant factor. These results, however, are for a particular group of districts at a particular point in time and may not be generalizable to other school districts.

There is a dearth of empirical literature that examines double dipping in school districts. Most of the literature is in the form of news stories that provide descriptive information and political discourse. There is also little empirical work with respect to school district governance issues. Dorata and Phillips (2015) examined management entrenchment and board independence associated with budget increases. The findings of our study raise many questions. If double dipping is legally constrained, would talented individuals be motivated to go into public-service positions with these less generous pension systems?

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How would a change in policy limiting double dipping affect the future of public education and other public-service delivery? How can the system be changed to minimize potential loss of employment opportunities for non-retirees? If the retirement paradigm has changed, should lawmakers evaluate the effect of this shift on pension systems and make the necessary adjustments? Additional research is needed to better understand these local governmental bodies.

This study has its limits. In particular, the governance analysis is limited to the sample of LI school districts responding to the governance survey. However, the current study can be extended to examine the governance attributes and their relationships between double dipper earnings and tax levy data, or to review the length of post-retirement service and its association with academic performance and school district fiscal and academic outcomes. There are ample opportunities for future research to build the literature base.

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Corruption and Culture: Empirical Analyses of Long-Term Indulgence and Corrupt Systems

Charles Lanier

Mary Kirchner

Abstract

This empirical study of 88 countries explored mathematical relationships between Hofstede's Cultural Dimensions and Transparency International's Corruption Perception Index. When predicting corruption perception, an interaction occurred between Hofstede and Minkov's (2010) two most recently published dimensions: Long-Term Orientation (LTO) and Indulgence Versus Restraint (IVR). Individually, each of these variables was a weak linear predictor. However, an interaction of the two was found to explain 34% of variability in the Corruption Perception Index (CPI).

The resulting compound variable significantly contributed to a three-variable model predicting nearly two-thirds of variability in the Corruption Perception Index. We concluded that extremes of neither *long-term orientation* nor *indulgence* were ideal for minimizing corruption. Implications include an improved understanding of relationships between culture and corruption. Further research is needed to more fully develop the most parsimonious and effective regression models.

INTRODUCTION

The main objective of this study was to further explore the potential of variables in the Hofstede paradigm to predict corruption, as well as investigate meaningful interaction effects among cultural dimensions. Hofstede's Cultural Dimensions as predictors, rather than correlates, of corruption at the national level

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were presented and discussed. Variable perceptions of corruption were shown to be driven by national cultural dimensions and particularly interactions, or mathematical convolutions, between two cultural dimensions.

Although culturally different, each of the countries included in these analyses has an opportunity to influence the behavior of its governmental units and citizens. Furthermore, each has exhibited a different profile of cultural dimensions (Hofstede, 1980; www.geert-hofstede.com). Using these measures of culture, one may explore relationships between culture and the evolution of behaviors. In this case, the behaviors are perceptions of corruption as defined by Transparency International.

LITERATURE REVIEW

Hofstede's Cultural Dimensions

Seminal works from Geert Hofstede containing concepts applied directly to this research topic included *Culture's Consequences: International Differences in Work-Related Values* (Hofstede, 1980), *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations* (Hofstede, 2001), and *Cultures and Organizations: Software of the Mind* (Hofstede, Hofstede, and Minkov, 2010). Minkov's (2007; 2011) extension of cultural dimensions from the World Value Survey included the addition of Indulgence Versus Restraint (IVR) as a relatively new variable to Hofstede's data matrix.

IVR was the most recently defined cultural dimension added in 2010 to Hofstede's five previously defined dimensions of Power Distance Index (PDI): Individualism Versus Collectivism (IND), Masculinity Versus Femininity (MAS), Uncertainty Avoidance Index (UAI) (Hofstede, 1980), and Long-term Versus Short-term Orientation (LTO) (Hofstede, 2001). As a social psychologist, Geert Hofstede has been considered the father of cross-cultural research due to his creation of a paradigm for national cultures. His definition of culture in *Culture's Consequences* (Hofstede, 1980) was "the collective programming of the mind which distinguishes the members of one human group from another" (p. 25).

Before Hofstede's work, human nature was widely considered a natural tendency attributable to all humans. Hofstede determined that human behavior must be redefined in terms of cultural context. Since much of the world's business, social, and psychological research had been conducted in North America and Europe, the conceptual framework for human nature was incomplete. Hofstede's findings strongly influenced the fields of psychology, sociology, business, and many other areas.

Hofstede's research is ongoing, and he has suggested several areas for future research. For example, he suggests that Asian researchers have an important role to play in conversing with colleagues from other parts of the world in order to escape from the cultural restrictions of one's own Western research perspective (Hofstede, 2001). Hofstede suggested future replications, simulations, and encouraged research in the business arena where he predicted that cultural norms of a long-term view and more responsibility toward society will outlast somewhat recent obsessions with growth and personal wealth.

Standard criticisms of Hofstede's work include weaknesses of surveys in general, that nations are not suitable for studying culture, that the use of one company

weakens the implications, that old data was used, and that more dimensions must be developed to explain human behavior. Even Hofstede himself raises questions about how American ideas for business may have been imported by businesses in other countries (Goodstein, Hunt, and Hofstede, 1981). However, some of these weaknesses may also act as strengths, depending on uses of the data, because Hofstede's cultural dimensions have often proved to be concise and powerful.

Transparency International's CPI

During the early 1990s, no measurements of corruption on a global scale existed. Movement toward a global economy was certainly underway, but there were no global conventions aimed at reporting and curbing corruption. In fact, the topic was taboo. Established in 1993, Transparency International was founded by a small group of individuals as a coalition against corruption. By 1995 the coalition published its first annual Corruption Perception Index (CPI), initially reported for 45 countries (www.transparency.org).

The goal of this composite index was to create a healthy competition between countries by raising awareness about corruption and creating incentives to reduce it. Corrupt practices are difficult to measure by their very nature, as they often include illegal activities deliberately hidden by perpetrators. Therefore, reported perceptions of corruption—by those in positions to observe it—are arguably the most reliable way to measure the pervasiveness of corrupt activities.

The CPI scale ranges from 0 to 100, indicating that a country is “highly corrupt” up to “very clean,” respectively. By 2016, the CPI was used to measure perceptions of corruption in 176 countries. Transparency International defines corruption as “the abuse of entrusted power for private gain” (www.transparency.org).

Culture and Corruption

Notably, researchers have analyzed applications of Hofstede's work (Kirkman, Lowe, and Gibson, 2006; Taras, Kirkman, and Steel, 2010) to suggest limitations and make recommendations for researchers who plan to utilize Hofstede's paradigm. Taras, Kirkman, and Steel (2010) noted that a quantitative examination of Hofstede's cultural value dimensions was “conspicuously absent” (p. 405) from the body of research. Therefore, they conducted a meta-analysis of nearly 600 empirical studies encompassing at least 200,000 participants. Relationships between cultural dimensions and measurable outcomes such as emotions, attitudes, behaviors, and job performance were explored.

One of the primary motivations for the extensive study conducted by Taras, Kirkman, and Steel (2010) was to determine the overall value of Hofstede's dimensions as predictors. Each of the four initially described cultural dimensions of PDI, IND, MAS, and UAI were analyzed for predictive power. Although IND was the most popular subject of study (Oyserman, Coon, and Kimmelmeier, 2002; Kirkman, Lowe, and Gibson, 2006), no evidence existed to suggest this dimension was the best predictor for expressions of culture (Taras, Kirkman, and Steel, 2010).

The decision proposed by Taras, Kirkman, and Steel (2010) to refrain from making predictions about relationships between specific cultural dimensions

and specific outcomes “but rather to take a higher level overview of Hofstede’s cultural value effects,” did not prevent them from publishing some very useful results. For example, regarding emotions and attitudes, cultural dimensions provided stronger predictive power than measures of personality. Furthermore, cultural dimensions proved to be a relatively valuable predictor of emotions, perceptions, and behaviors. Ultimately, the recommendation for scholars to continue using Hofstede’s framework in research was strongly supported as long as culture was relevant to the research question and national dimensions of culture were suitable.

Perhaps most relevant to this research, the following statistically significant ($p < 0.05$) positive and negative correlation relationships presented in Table 1, were reported when studying data at the national level (Taras, Kirkman, and Steel, 2010).

Results of these meta-analyses signify the importance of cultural dimensions as significant predictors of many emotions and attitudes related to corruption. Note that corruption was correlated with each of Hofstede’s four initial cultural dimensions in these analyses. In order of strength, these relationships to corruption appeared to be most strongly connected to the cultural dimensions of IDV (−0.84), PDI (+0.83), UAI (+0.43), and MAS (+0.29).

At the time of the above studies, Long-term Versus Short-term Orientation (LTO) was a relatively new variable. Likewise, Indulgence Versus Restraint (IVR) had been only recently defined by Minkov (2007; 2011). Therefore, neither LTO nor IVR were included in the comprehensive work by Taras, Kirkman, and Steel (2010).

TABLE 1. Correlations Between Hofstede’s Cultural Dimensions and Corruption

Individualism Versus Collectivism (IDV)			
Positive		Negative	
Wealth	0.70	Corruption	−0.84
Innovation	0.65	Family Importance	−0.55
Income Equality/Satisfaction	0.64	External Locus of Control	−0.46
Individualism Masculinity Versus Femininity (MAS)			
Corruption	0.29	Gender Role Equality	−0.50
Wealth	0.11	Satisfaction	−0.16
Power Distance Index (PDI)			
Corruption	0.83	Income Equality	−0.60
Agreeableness	0.46	Openness	−0.54
Conformity	0.42	Gender Role Equality	−0.49
Uncertainty Avoidance Index (UAI)			
Neuroticism	0.59	Satisfaction	−0.49
Corruption	0.43	Innovation	−0.45
Conformity	0.26	Income Equality	−0.025

Other studies from Western, Middle Eastern, and Asian perspectives have also reported findings relating corruption to dimensions of culture. For example, Getz and Volkema (2001) found that PDI was positively associated with corruption, and that UAI moderated relationships between corruption and economic adversity. Davis and Ruhe (2003) stated that PDI, IDV, and MAS explained a significant portion of the variability in perceived corruption. Results from Seleim and Bontis (2009) provided empirical support for the influence of UAI and IDV on levels of corruption after controlling for economic and human development in an effort to add to a more general theory regarding culture perspectives on corruption.

More recently, Yeganeh (2014) integrated three frameworks into one study. Findings included that Hofstede's high PDI, high UAI, high MAS, and low IDV—along with Schwartz's Conservatism and Harmony, and Inglehart's Survival and Traditional-religious dimensions—were associated with corrupt behavior. By contrast, Hofstede's low PDI, low UAI, low MAS, and high IDV—along with Schwartz's Autonomy and Mastery, and Inglehart's Self-expression and Rational-secular dimensions—tended to impede corruption.

Also, a relatively recent study from the Eastern/Chinese perspective revealed that PDI, UAI, IDV, and LTO seemed to help explain Chinese corruption. However, Hofstede's other dimensions of MAS and IVR were not clearly associated with corruption in the study. Perhaps especially relevant to this study, Tong (2014) explained that the long-term orientation of Chinese culture “fosters the importance of maintaining relationships, which often involve corrupt activities” (p. 13).

Research techniques similar to a previous study applying Hofstede's framework of cultural dimensions were used for this study of corruption behavior. Lannier (2011) employed correlations and linear regressions to study beverage consumption within nations. These techniques revealed an interactive relationship, known as a mathematical convolution, among two cultural dimensions that was otherwise masked by the independent variables used. Such a relationship may exist among cultural dimensions in the context of studying corruption as well.

METHODOLOGY

The general methodology considered appropriate for this study included correlations and least squares linear regression. Of particular interest was the possibility of discovering mathematical convolutions, (i.e., interactions between variables), that would be especially useful in explaining the Corruption Perception Index, CPI. Therefore, the primary research question revolved around products of variable pairs.

The nature of cultural dimensions suggests that, although independent by design, some combination of such variables must be at work in any given context. This is intuitive to anyone who has spent time in a culture other than their own. It is not merely one variable that is of interest for the traveler, but a unique combination of differences that make for that unique experience.

Another analogy: A single one of the five senses would not be considered sufficient information to describe any experience. Neither would a single dimen-

sion of culture be sufficient to describe any behavior. Therefore, it is the combination of variables, indeed the *relationship among variables*, that should prove useful in describing behavior.

Moreover, a useful mathematical convolution was discovered for a study of international behaviors regarding beverage consumption (Lanier, 2013). Therefore, it seemed possible that a similar case might exist when studying other international behaviors; in this case, corruption. If some pair of Hofstede's dimensions was useful in describing the variability of CPI, then perhaps new behavioral models could be constructed.

Data Collection

CPI values were used as the dependent variable, and Hofstede's six dimensions served as independent variables. Two sources of data were utilized to build two datasets for the purposes of this study: First, five years of the CPI were available for 176 countries, from 2012 to 2016. For the majority of this study, CPI 2016 was used. Earlier years were only used to confirm findings that resulted from using CPI 2016 as the dependent variable.

Hofstede's matrix of dimensions was available for 111 countries. These two data sources were matched by country to form a complete dataset/matrix for 63 different countries. Additionally, Hofstede's most recently developed dimensions of LTO and IVR were available for more countries. Therefore, a matrix of 88 countries had data for CPI, LTO, and IVR, but data was missing for the four dimensions published by Hofstede prior to 2001.

Correlations and Regressions

The first step was to create a correlation matrix including CPI and all six of Hofstede's Cultural Dimensions. Next, linear regressions were conducted to construct a prediction equation for each of the independent cultural variables. These single-variable prediction equations took the following form:

$$Y = a + b_i X_i + e$$

Where

X_i represents one of Hofstede's six cultural dimensions
 $i = 1$ to 6

The first two research questions were, "Are correlations between CPI and Hofstede's Cultural Dimensions stable, as reported by earlier research?" and "Are Hofstede's Cultural Dimensions significant predictors of CPI in the constructed dataset, as previously observed by other researchers?" To replicate most of the studies reviewed in the literature, the multi-variable equation was purely additive. Using only Hofstede's six dimensions resulted in

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + e$$

However, in this study, interaction effects—mathematical convolutions—were examined of the form

$$\text{CPI} = a + b_{ij}X_iX_j + e$$

Where

$$i = 1 \text{ to } 6$$

$$j = 1 \text{ to } 6$$

$$i \neq j$$

or more simply

$$\text{CPI} = a + b_{ij}X_{ij} + e$$

Where

X_{ij} , is a convolution of functions X_i and X_j

The third, and perhaps most compelling, research question was “Do one or more mathematical convolutions act as a statistically significant predictor of CPI?” In theory, a “new” compound variable could displace one or more of the commonly identified cultural dimensions predicting corruption. The null hypothesis is that such a variable does not exist (i.e., b_{ij} is not significantly different from zero).

Each pair of cultural dimensions, X_iX_j , represents a cross-product potentially resulting in a beneficial interaction effect between two cultural dimensions. That is, the function X_i and the function X_j can be expressed as a third function X_{ij} . Such an interaction may be referred to as a convolution of the original functions.

For mathematical purposes, it is important to note here that each of Hofstede’s Cultural Dimensions does in fact behave as a “function.” That is, for each participating country there is only one value provided for each dimension. It is not possible for a country to have two values for Power Distance Index, for example.

Finally, the fourth research question was “What form does a parsimonious model for predicting CPI take, and does such a model include one of the studied mathematical convolutions?” The expectation was that a statistically significant model constructed using stepwise regression procedures exists. However, whether or not one of the compound variables X_{ij} would be useful was completely unknown at the outset of this experiment.

Theoretically, these formulae could be extended further to include trios of variables, X_{ijk} . Future studies could potentially make pragmatic use of such constructions. However, this study was limited to pairs of variables to simplify the interpretation of outcomes.

FINDINGS

The first research question of interest was, “Are correlations between CPI and Hofstede’s Cultural Dimensions stable, as reported by earlier research?” First, it should be noted that the signs, indicating direct or inverse relationships, will

be reversed from the values reported by Taras, Kirkman, and Steel (2010). This is because with the CPI, a low corruption score is indicative of more corruption, and a higher score is indicative of less corruption. The polarity of these variables is an important, but sometimes challenging nuance when studying CPI data.

All of the correlations presented in Table 2 align with those reported by Tara, Kirkman, and Steel (2010). Although the magnitude of each correlation is slightly weaker in this study, the direction is identical. These relationships to corruption match earlier results in order of strength as well: IDV and PDI followed by UAI then MAS. Recall that LTO and IVR were not studied in the meta-analyses, so we have no information to compare for the two most recently developed dimensions. It is also worthwhile to note correlations among Hofstede's Cultural Dimensions.

The second research question was, "Are Hofstede's Cultural Dimensions significant predictors of CPI in the constructed dataset, as previously observed by other researchers?" The data matrix with all seven variables for 63 countries was used for this analysis.

PDI and IDV were shown to be highly significant predictors of corruption as measured by CPI in 2016. This is consistent with earlier studies. The other four dimensions, MAS, UAI, LTO, and IVR, were not found to be statistically significant, although they sometimes did show up in analyses performed by other researchers. The values for LTO and IVR were presented in Table 3 for comparative purposes as they will be used later in this study's analyses.

At this point, one could be satisfied that PDI or IDV dominate the prediction of CPI and decide that no further study is worthwhile. This finding would be consistent with previously described relationships between corruption and cultural dimensions. However, the third research question asks, "Do one or more mathematical convolutions act as a statistically significant predictor of CPI?" Alternatively stated, "Do interaction effects exist between cultural dimen-

TABLE 2. Correlations Among Hofstede's Cultural Dimensions, and with CPI 2016

(n = 63)	CPI 2016	PDI	IDV	MAS	UAI	LTO	IVR
CPI 2016	1						
PDI	-0.659	1					
IDV	0.658	-0.646	1				
MAS	-0.178	0.168	0.040	1			
UAI	-0.303	0.204	-0.202	0.0100	1		
LTO	0.237	0.035	0.078	0.0188	-0.022	1	
IVR	0.209	-0.305	0.166	0.0786	-0.075	-0.516	1

TABLE 3. R-Square Calculations Dimensions when Predicting CPI 2016 in Isolation (Alone)

CPI 2016 (n = 63)	Power Distance Index (PDI)	Individualism (IDV)	Long-Term Orientation (LTO)	Indulgence Versus Restraint (IVR)
Coefficient of Determination	0.435*	0.432*	0.056	0.044
Probability	< 0.0001	< 0.0001	0.062	0.100

This table shows the prediction strengths and significance of Hofstede's dimensions for CPI.

*Indicates very strong statistical significance.

sions thereby improving prediction models of the same form when predicting corruption?" To answer this question, one must study pairs of variables.

Several pairs were studied, but only one showed promise: An interesting interaction between LTO and IVR. The results in Table 4 demonstrate this convolution represented by "LTO*IVR." When focusing on LTO and IVR it was possible to analyze the same 63 countries as before, but also possible to analyze the 88 countries with data for only CPI, LTO, and IVR. The analyses of this research question established several new pieces of evidence:

1. Power Distance and Individualism were significant, each accounting for about 43% of the variability in CPI in isolation.
2. Hofstede's Cultural Dimensions might explain even more of the variability in corruption perception when interactions are considered.
3. Prediction equations could likely be improved and refined by modifying the regression model and applying statistical techniques.

Regressions on many possible variations of the six predictor variables were conducted using pairs. The contributions of predictor variables may be expected to overlap, and therefore the model's overall effectiveness is less than the sum of its parts. However, it is possible for variables to interact in such a way that the overall effect is *greater* than the sum of its parts. This synergetic effect can be explained by mathematical convolution.

For example, LTO alone explained about 5% of the variability observed in CPI, and IVR explained between 4% and 9% of that variability. One might expect that these two variables together predict no more than 14% of the variability observed in CPI. Surprisingly, the model with a convolution of LTO and IVR entered as a predictor of CPI yielded an R^2 of 0.216, explaining 21.6% of the variability in CPI. This synergetic relationship is indicative of an interaction effect.

Finally, the fourth research question could be answered. It was, "What form does a parsimonious model for predicting CPI take, and does such a model include one of the studied mathematical convolutions?" A stepwise linear regression procedure was employed to conduct the analyses. To include all of Hofstede's Cultural Dimensions, the dataset of 63 countries was necessary.

The first variable entered into the prediction model was PDI, Power Distance Index. PDI was highly significant, and explained 43.5% of the variability in CPI, as expected. The second variable entered into the model was LTO*IVR, our newly constructed mathematical convolution of two cultural dimensions! LTO*IVR boosted the R-square to 0.577, meaning that 57.7% of the variability in CPI was explained.

TABLE 4. Selected Models from a Comprehensive Search for Interactions (Math Convolutions)

Predictor Variables	Model's R-square	Statistical Significance	Change in R2 Due to Interaction
(n = 63)			
LTO	5.6%	No	n/a
IVR	4.4%	No	n/a
LTO*IVR	31.6%	P < 0.0001	+21.6
(n = 88)			
LTO	5.0%	p < 0.05	n/a
IVR	8.9%	p < 0.005	n/a
LTO*IVR	33.8%	p < 0.0001	+19.9

This table shows univariate models to predict CPI and includes one convolution.

Recall that LTO and IVR appeared to contribute little or nothing to the model's predictive power when used in isolation. Yet the compound variable LTO*IVR made the second-most significant contribution as seen in Table 5.

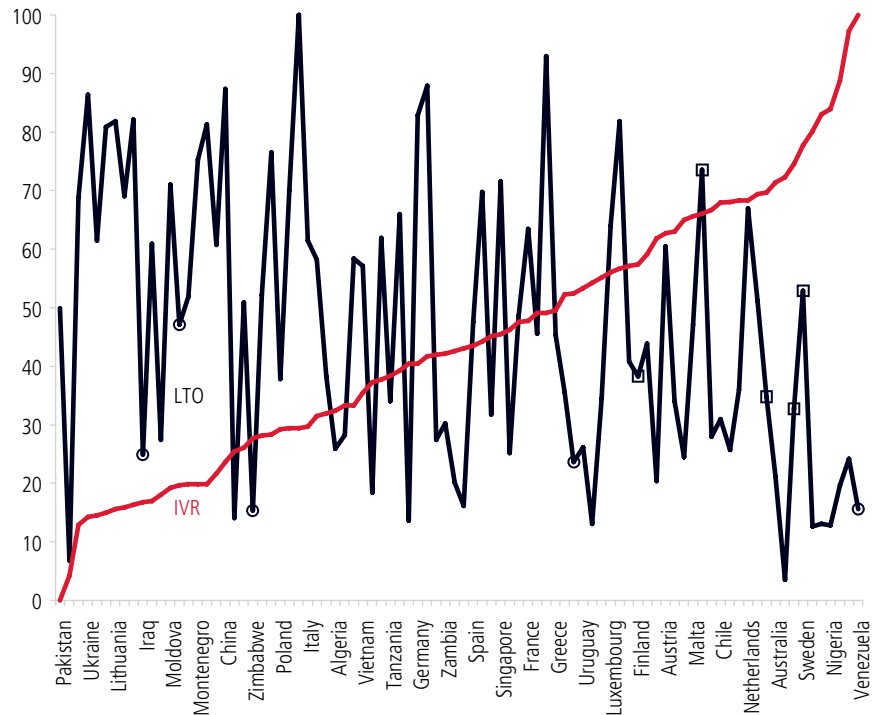
CONCLUSIONS

This study has taken a broad view of the relationships between Hofstede's Cultural Dimensions and the Corruption Perception Index in 88 of the world's countries. Hopefully, there is enough material contained within the above models, equations, and results to encourage further study of these and other relationships. Only some of the many potential findings, examples, and implications are given here.

TABLE 5. Linear Regression Results Using Mathematical Convolutions as Predictors

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	16475	4118.7	27.96	< 0.0001
Error	58	8543.4	147.3		
Corrected Total	62	25018			
Variable	Parameter Estimate	Standard Error	F-Value	Pr > t	
Intercept	52.9982	9.60363	30.45	< 0.0001	
PDI	-0.2844	0.1029	7.64	0.0076	
LTO*IVR	0.0067	0.0015	19.45	< 0.0001	
IDV	0.3025	0.0884	11.70	0.0012	
MAS	-0.1625	0.0792	4.20	0.0449	

This table shows the Analysis of Variance when Hofstede's Cultural Dimensions are the lone predictors of CPI 2016.

FIGURE 1. LTO and IVR Are Inversely Related; Sorted by IVR

Upon further review of the data, one discovers that LTO and IVR are inversely related ($r = -0.52$, from Table 2). This inverse relationship probably masked the potential for either to contribute significantly to predictive models for CPI. However, after observing the significance of an interaction between these two dimensions, the potential usefulness of convolutions is apparent visually as well as mathematically.

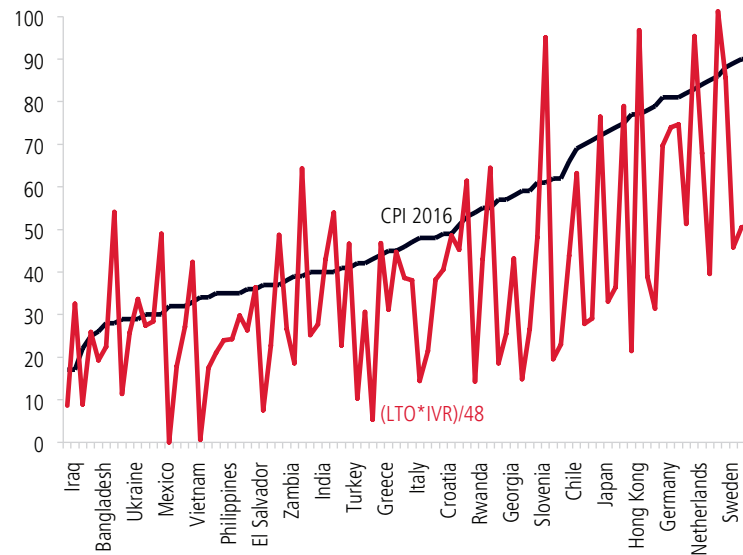
Figure 1 demonstrates the nature of the inverse relationship between LTO and IVR. Furthermore, identification of individual countries on this new scale of LTO*IVR leads to more questions that should be explored.

Overall, analyses conducted for this study revealed some useful results. First and foremost, the belief that Power Distance was a factor in corruption was upheld. Power Distance appears to be a stable and key factor in corruption perception. However, it is also clear that Hofstede's Cultural Dimensions of Long-term Orientation and Indulgence Versus Restraint enhance the understanding of corruption.

Although neither of these dimensions was a worthy predictor when isolated, the mathematical convolution of LTO and IVR shows powerful potential. Both of these variables are relatively recent introductions to the study of culture. It should be noted that LTO*IVR did in fact displace IDV, often discussed along with PDI as a significant predictor of corruption. Further study of these predictive roles is recommended.

Extremes of neither LTO nor IVR appear to be ideal for minimizing corruption. The concept “more is better”—if LTO is good then higher is better, or if Indulgence is helpful then let's be more so—cannot apply to inversely related variables. More of one is, by definition, less of the other. Therefore, a balance must be struck between the two variables.

FIGURE 2. CPI and the Mathematical Convolution LTO*IVR Are Directly Related; Sorted by CP



The balance in this data seems to indicate that moderate LTO combined with somewhat high IVR impedes corruption. The extreme cases of Denmark, New Zealand, Finland, and Sweden all appear to be clustered near the right side of Figure 1, but neither very high nor low on the LTO scale. The interaction among these two variables is required for better understanding of corruption.

Those countries with the lowest CPI, perceiving more corruption, have slightly lower LTO scores but are scattered across the entire IVR scale. The extreme cases of Iraq, Venezuela, Zimbabwe, Uganda, and Bangladesh are distributed throughout the lower half of Figure 1. Arguably, toward the middle of Figure 1, countries found to have centralized scores on both scales limits the pitfalls of either extreme. Singapore, in the center of Figure 1, is seventh highest on the CPI scale.

If extremes on these scales are shown to be problematic, perhaps there is a point of equilibrium balancing the forces of corruption. Perhaps average is the ideal: A Lagrange Point to be found between culture-based Indulgence and a society's interpretations of Time? Using Guatemala as an example, a country the authors have visited dozens of times, both Long-Term Orientation and Indulgence can be seen to aggravate corruption. People with a long-term view may indulge in corrupt behavior partly because participation in corrupt systems has been unfortunately rewarded over long periods of time. Long-Term Orientation then is not "good" or "bad" but interacts with other cultural elements to deter or encourage corruption.

Inevitably, when one interaction effect can be demonstrated among Hofstede's Cultural Dimensions, the promise exists for more. In other contexts, with other variables, only continued research will disclose the nature of relationships among variables. In this case, Hofstede's measure of Indulgence interacted with his Long-Term Orientation variable to predict corruption. This finding alone uncovers the potential for other paired variables. These potential interactions and statistical techniques may facilitate research in any behavioral setting.

A case was supported for developing new predictive equations for a variety of purposes. For example, business as a field is data rich, but much of the available information is not used to its fullest purpose. Opportunities abound for the business researcher to glean information from many sources of data, and produce meaningful models that enhance our understanding of human interactions.

Finally, it is reasonable to conclude that the evolution of corruption and many other socio-political behaviors takes place differently in each country. Cultural variables are at least partially, if not largely, responsible for these patterns. Ethical decisions and corrupt behaviors depend on the measurable cultural and societal variables researched for this study. What other behaviors might benefit from similar modeling?

Taras, Kirkman, and Steel (2010) alluded to the predictive power of Hofstede's Cultural Dimensions, but concrete business examples of predictive equations and interactions between dimensions were scarce. Therefore, the practical implications of this 88 nation study should be clear for business researchers, economists, political scientists, and many multinational companies. Theoretical implications are clear for researchers in psychology, sociology, business, and other fields: Interaction effects among cultural dimensions deserve further study, and recently introduced IVR may be a powerful idea for better understanding culture in the context of behaviors.

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Institutions in the Shark Fin Market: Externalities and Incentives

Nathaniel Grimes

Abstract

This study analyzes the role institutions have in shaping incentives within the shark fin market. It combines literature findings from multifarious fields of fisheries economics, shark biology, and institutional economics to provide an argument that institutions, both formal and informal, were fundamental in establishing the market, guiding how it operates currently, and are needed to find ways to correct for negative externalities engendered by sharks' functions in ecosystems. The strength of the formal institutions of the primary nations involved was measured through the economic freedom index, and classified in terms of inadequate, ineffective, and effective based on how efficient those nations were at conserving shark populations. Developing nations generally provided inadequate institutions that lead to shark finning and overexploitation of their populations. Ineffective institutions are carried out by developed nations with strong enforcement capabilities and high economic freedom, but unproductive management or incentives are in place. Separate methods to properly align incentives in developing and developed nations are suggested. This study recommends using incentive-based strategies, such as a by-catch reward system, in developed nations due to their ability to centrally enforce such policies. For developing nations, locally structured property rights need to be distributed to allow fishermen a stake in the conservation of sharks. These applications can provide both economic and environmental sustainability for shark populations.

INTRODUCTION

The natural environment and the global economy are much more inextricably linked than first appearance would imply. Numerous business activities revolve around the acquisition of natural products often obtained from wild sources. In some cases the extent of capture exceeds the rate of growth for the natural environment to replace. This discrepancy is most relevant in natural resources that are common goods. Common goods are resources that are non-excludable and rival, in that once extracted the resources are no longer available to other

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users (Basurto, 2005). Common goods are often subject to what is known as the *tragedy of the commons* where the resources are overexploited. The rival and non-excludable nature of common goods leads to the formation of incentives that guide users to allocate for themselves as much of the resources as possible before a competitor extracts those very same resources. Commercially caught fisheries exhibit all the characteristics of common goods.

To mitigate the loss of social welfare from the exploitation of common resources, institutions are imperative to establishing the rules of the game for the market. Those rules structure the incentives that guide human economic activity (Baumol, 1990). Human economic activity impacts the environment through direct resource extraction or indirectly by consequence. Institutions are also fundamental to defining property rights (Jentoft, 2003). In the fishing industry, the difficulty in establishing property rights through a lack of strong institution often leads to overexploitation (Gordon, 1954). This would be a clear example of destructive entrepreneurship as the seemingly inexhaustible renewable fishing resource is systematically degraded through profit-maximizing behavior (Baumol, 1990; Gordon, 1954). Within the global fishing industry, no market better highlights this scenario than the market for shark fins.

Shark fisheries have the characteristic signs of a pool of resources subject to the tragedy of the commons. However, there are additional factors originating from the biology of sharks and the nature of the capture techniques that distinguish this market from other wild-caught fisheries. First, the difference in the value of a shark fin compared to the rest of the shark leads to an incentive to fin the sharks. This leads to significantly more sharks being captured than would otherwise be possible. Second, sharks have life histories characterized by slow growth, low fecundity, and late maturity distinct from their fishery counterparts of pelagic teleosts like tuna (Au, Smith, and Show, 2008). These biological constraints make it exceedingly difficult for shark populations to recover from fishing pressures. Third, paucity of shark capture data, both for shark fins and total shark meat, limits the effectiveness of monitoring and enforcement measures. Without capture data as well as market data such as price, it is arduous to predict the extent of the market and make future management policies. Finally, sharks have a unique role in structuring the ecosystem and their removal may cause costly effects on production in other aquatic industries in the form of negative externalities.

This study will examine the roles of institutions both formal and informal in the growth and function of the shark fin market. To understand and develop a clear picture of the market and the institutions currently structuring the shark fin market, an analysis on the driving forces will be conducted with a brief review on seminal work conducted. The role of institutions in data collection will also be addressed and how opaque regulation and enforcement have led to a depravity in data, from which the cycle of institutions is disrupted. Economic freedom of the nations auspiciously involved in the market will be used as a metric for determining the effectiveness of institutions. To understand the destructive nature of the shark fin market from the formation of negative externalities, the biology of sharks and their importance in the ecosystem will be discussed. Additional externalities from shark propelled ecotourism is also addressed and to what extent they degrade social welfare. Whether there are ways incentives can be aligned through the construction of institutions that are able to place effective property

rights or regulations to design an appropriate set of rules will be illuminated. Examples will be drawn from other fields of study as there is yet to be a definitive argument for the case of shark finning leading to externalities and strategies to mitigate such consequences. All of these issues will be addressed through a combination of theoretical ideas and comparison to case studies done in other marine commodity fields.

THE MARKET FOR SHARK FINS: DRIVERS, SUPPLIERS, AND DENIERS

Shark fins are acquired in two ways, either the whole body utilization of captured shark where the fins are removed once landed, or by the act of finning defined as removing the fins of a shark and discarding the body at sea (Cortes and Neer, 2006). The issue with finning is that it allows for the profligate waste of entire sharks. Finning is done as the value of the shark fins can be order of magnitude higher than the rest of the shark. Therefore, as profit-maximizing individuals, the fisherman will want to allocate only the fins on their space-limited boat (Hareide, et al., 2007). This leads to a disproportionate capture return on sharks and the overexploitation of the resource. Also, sharks are usually finned as a product of by-catch in tuna and swordfish long line industries (Hareide, et al., 2007). The market for shark fins is opaque, yet analysis does indicate there are typical market operations occurring. For example, there are defined preferences in shark fin products for different species due to the varying quality between species (Fong and Anderson, 2001). These preferences are directed at large predatory sharks with characteristically sizeable fins, such as Sphyrnidae hammerheads, or species with high densities of ceratotrichia (Clarke, 2004).

The seminal paper analyzing the shark fin market was done by Clarke, et al. (2006b) to estimate the global value of shark fins in the world and to determine the biological mass of sharks depleted. Clarke, et al. (2006b) employed Bayesian statistical models to convert sparse data from Hong Kong shark fin imports into a sum of shark fins traded into Hong Kong. Based on Hong Kong's assumed market share, a global approximation of harvested sharks was derived. Biologically derived conversion factors converted the number of fins traded to the global biomass of sharks finned. Clarke, et al. (2006b) found that 26–73 million sharks were killed in the world in 2000 for their fins. This equated to \$400–\$550 million worth of exchange, almost four times higher than data reported to the United Nations FAO estimate for shark fins. Leah Biery conducted another study attempting to quantify the shark fin market in 2012. Using combined samples from the Sea Around Us projects, journal entries, trade data from nations and the FAO, and anecdotal reports, she compiled a Best Catch Estimate for nearly every nation in the world. From these estimates, she calculated the amount of shark fin harvested within each nation. Biery found that 19–38 million sharks a year from 2000–2009 were caught and finned. Like Clarke, et al. (2006 b), Biery found that total value of trade was higher than the reported FAO by a significant margin.

Global supply of shark fins encompasses all oceans and numerous nations. Countries with institutions that place incentives on shark finning or lack strong regulatory behavior comprise the majority of global production (Biery and Pauly, 2012). The following two sections describe how different institutions affect the

supply and demand, respectively. Cultural perceptions act as an informal institution that spurs demand in the market. The formal institutions that affect the aspects of supply, such as data reporting, will be detailed afterward.

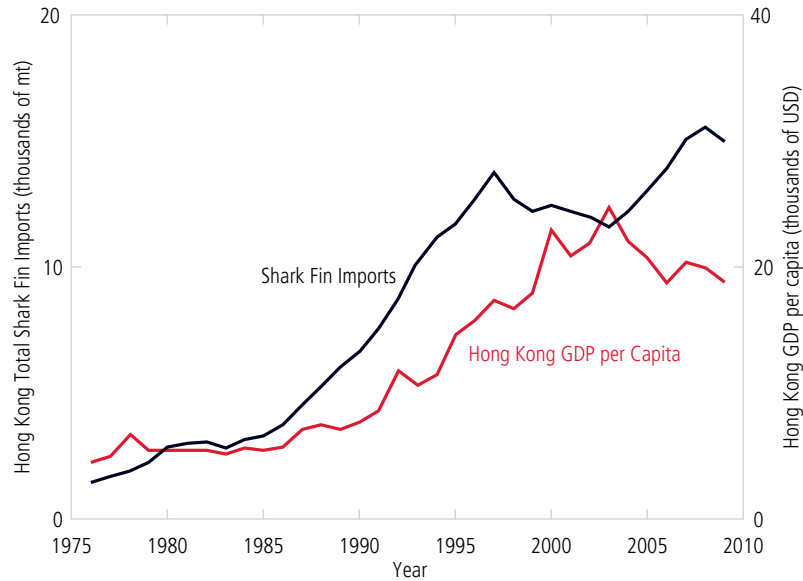
Informal Institutions Shaping Demand

Consumption is driven by the Hong Kong and Chinese markets (Clarke, et al., 2006a). An informal institution dictates and creates the incentives for the Cantonese cuisine affinity for shark fins. Shark fins are a popular luxury good. Their primary use is for consumption as an ingredient to shark fin soup. The fins only serve to provide texture and absorb taste through the alignment of the shark ceratotrichia, or cartilaginous fin rays (Clarke and Milner-Gulland, 2007). Shark fin soup has been a staple to Chinese cultural dishes as a symbol of affluence and believed to provide some medicinal properties. Though legitimacy of the medicinal elements have been brought into question, there is little doubt that shark fins offer a sign of social status. Shark fins are traditionally a focal dish of Chinese weddings and celebratory banquets where lavishness is encouraged. Originally served during the Song Dynasty (960–1279 A.D.) and fully established as the primary component of imperial banquets in the Ming Dynasty (1368–1644 A.D.), shark fins were engrained to the Chinese populace as a means to impress the emperor (Clarke and Milner-Gulland, 2007). This sentiment began to permeate and mutate to a symbol of general wealth still recognized today throughout the populace.

Due to their informal cultural institutions that lead to incentives for consuming shark fins, China and Hong Kong are the largest consumers in the world. The cultural significance ascribed to shark fins as a measure of wealth, creates an incentive for individuals to demonstrate their affluence, fuels the demand for shark fins. In 2000 Hong Kong had a 44–59% approximate share of the global imports (Clarke, 2004). The percentage share of consumption by Hong Kong has gone down in the last few years primarily due to the emergence of China, both in terms of wealth and entry into the World Trade Organization. Together however, China and Hong Kong continue to dominate the market. As described above, shark fin consumption has been engrained into Chinese cultural sentiments for millennia, but has only recently become the massive multi-million dollar trade market of today. What catalyzed this increase in consumption were the near exponential growth of Hong Kong since the 1960s and the growth of China since the beginning of 1990s.

How this growth translates into increased shark fin consumption is through the income effect. As China and Hong Kong have grown, their disposable income for all their citizens has increased. By the income effect, an increase in disposable income leads to an increase in the demand for previously unobtainable luxury goods (Dubois and Duquesne, 1993). With the steady rise in growth for Hong Kong, there has been a subsequent increase in shark fin importation (Figure 1). Importation data is more readily available and there is no quantified metric for the consumption of shark fin within those nations. Since Hong Kong is essentially isolated and cannot catch any significant numbers of sharks itself, it is required to import most of the shark fins it wishes to consume (Clarke and Milner-Gulland, 2007). Import values from China are more recondite as there is little reliable data for the shark fins. Lack of reliable data is not just in Chinese

FIGURE 1. Hong Kong Imports of Shark Fin and GDP per Capita from 1976–2009. GDP per capita is used as a proxy for disposable income. Data was retrieved from the World Bank for the GDP per capita and the imports from the FishStatJ (FAO 2013).



and Hong Kong markets where prices, catch, and true consumption data are missing, but also in the global supply of shark fins.

Knowledge as Feedback for Institutions

The supply of shark fins is also dictated by institutions. Unlike the demand for shark fins where informal institutions are the primary driver, formal institutions, or lack thereof, influence supply. States are major influencers of formal institutions (Peterson, 2002). The institutions a government creates can be either specific, such as policies and particular management plans, or broad, as in state's ability to enforce policies for promoting economic freedom. Two distinct areas that formal institutions affect in the shark fin market are management and the reporting of catch data. Though not a direct economic outcome, the collection of data is imperative for a feedback loop in the cycle of institutions forming the rules of the game leading to incentives that guide economic outcomes (Boettke, 1993). Generally in a free market economy, prices and consumption quantities, or the measurable allocation of resources, act as the requisite information for updating how institutions ought to operate (Boettke, 1993). In the shark fin market there are two characteristics that are preventing this feedback cycle from functioning.

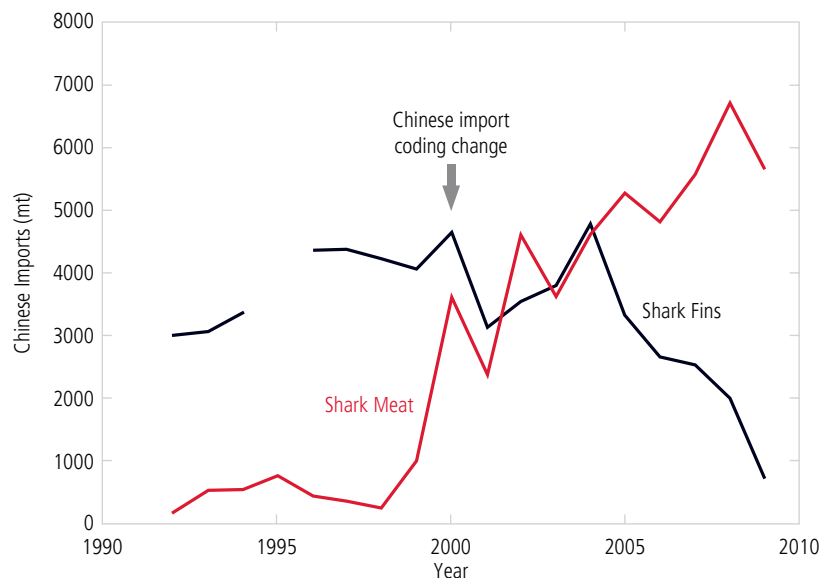
The first is partially due to the inherent difficulty in recording data for shark fins. Some of the difficulty arises from the complex issue of compiling catch reports at sea, which plagues all fisheries. The ability for fishermen to accurately differentiate species, and the prevarication of shark fin catch by fishermen due to the generally illegal nature of shark finning adds to the issue (Hareide, et al., 2007). When the fins are separated from the bodies, it is difficult to provide estimates for the quantity of sharks landed (Biery and Pauly, 2012). This problem is exacerbated by international trade coding policies. This equivocation of the data often leads to underreporting of shark catch implying healthy shark populations (Clarke, et al., 2007). This is an institutional flaw as it is nations that prescribe trading policies. Effects from changes in trade coding policies on the shark fin import data is most apparent in China and their reported values to the UN Fisheries and Agricultural Organization (FAO).

The best readily available data resource for fishery trade data is the FishStatJ tool provided by the FAO. FishStatJ provides total capture, trade, production, and aquaculture production of every marine product in every nation that reports to the FAO in terms of weight and value. Though commendable, FishStatJ contains inaccuracies arising mostly from a lack of set guidelines for trade reporting. FishStatJ must be excused from these errors though, as it is the nations who are erring in the reporting of their trade, as demonstrated next.

Before 2000, China's import commodity coding system had a specific category for shark fins. Implemented in 2000, China made an amendment to its coding policy and placed all imported frozen shark fins into the same category as shark meat (Clarke, et al., 2006b). Changing the coding caused a disturbance in China's import of shark fins (Figure 2). China did not simply stop importing or consuming shark fins, the market would be become evanescent, but shark fin consumption remains prevalent in China (Clarke and Milner-Gulland, 2007). This example demonstrates the role government practices can play in allowing feedback to occur and it is not isolated to China alone. Other developed and developing nations misreport their catch, as the use of observers is sparsely employed. Additionally, artisanal fisheries in less-developed nations have an even greater difficulty in the report of their catches (Smale, 2008). Together these misleading data aggregate into an opaque market. Estimations through trade data analysis and Best Catch Estimates highlight that the reported information is erroneous (Clarke, et al., 2006b; Biery, 2012). Misrepresentative data can be used to fuel incentives. If data is underreported it implies that sharks have a healthy population and the resource can sustain increased fishing pressures, leading to higher quota allowance (Clarke, et al., 2007).

The second characteristic that inhibits information dissemination is the responses to market interactions within Hong Kong and China. Through direct anecdotal evidence, there is indeed a functioning market within the Cantonese area (Fong and Anderson, 2001). Preferences and prices are dictating consumer demand, but both China and Hong Kong have taken little managerial effort to quantify the internal trade market. Without these fundamental data points it is challenging to get a picture of the market and the effects on shark populations.

FIGURE 2. Chinese Frozen Shark Meat and Frozen Shark Fin Imports from 1991–2009. The arrow points out the implementation of the Chinese coding policy change that moved shark fin imports into shark meat import category. In 1995 there was no data reported by China for shark fins to the FAO. Data compiled from FishStatJ (FAO 2013).



Data translates to knowledge that is required for effective policies and cycled through the institutions (Barker and Schluessel, 2005). With estimations as high 73 million sharks a year caught for their fins, there have been pernicious reductions in shark populations (Clarke, et al., 2006b; Dulvy, et al., 2014). To begin to properly analyze this market, species specific data needs to be acquired. This can be done through proactive strengthening of formal institutions to create incentives to properly record capture data and reaching an international agreement on how sharks fins ought to be recorded within trade statistics. With more data available, both economists and biologists can begin to assess the true impact of the shark fin market and be able to inform players of possible effective management strategies.

Strength of Institutions in the Supply of Shark Fins

Institutional strength affects data collection. It is through the strength of the institutions that engender the economic outcomes. As it is problematic and convoluted to measure the direct strength of an institution, the Economic Freedom Index can be a proxy to measure the direct strength of an institution. The Economic Freedom Index can be a measure of institutional quality where higher ranks imply more free institutions (Nystrom, 2008). Within the index, four categories that all relate to institutional structure measure the ability for individuals within the nation to operate autonomously (Heritage Foundation, 2013). For shark fins, the influence of two of the measures is particularly important. The rule of law and regulatory efficiency measures are effectively or ineffectively structuring the market. The leading nations that supply shark fins and the high seas score very low in economic freedom. Table 1 below depicts this outcome. Together, the top ten nations and the high seas account for approximately 60% of all the supply.

With the notable exceptions of New Zealand, Taiwan, and Spain, all the nations have some of the highest possible rankings, from which weak institutions can be inferred. Instead

TABLE 1. Economic Freedom Rank of the Top Shark Fin Suppliers

Country	Production Rank	% of Global Production	Economic Freedom Rank
India	1	9.51	119
Trinidad and Tobago	2	5.44	72
Taiwan	3	4.84	20*
Pakistan	4	4.8	121
Indonesia	5	4.2	108
Sri Lanka	6	3.24	81
Iran	7	2.58	168
Spain	8	2.5	46*
New Zealand	9	2.35	4*
Brazil	10	2.17	100
High seas	N/A	19.68	N/A

*Represents a nation with ineffective institutions. There is no economic freedom measure for the high seas as it is not under any sovereignty. Rankings for economic freedom were obtained from the Heritage Foundation. Measures of percentage of global shark fin production obtained from Biery (2012).

of segregating actors in the shark fin market with either strong or weak institutions, they ought to be separated into categories of inadequate, ineffective, and effective institutions. The presence of highly free nations with strong institutions, yet are significant actors in the market, opens up the argument that the institutions are designing ineffective incentives to mitigate shark finning. Also Taiwan and New Zealand have legislation in progress of being passed and implemented that require shark to be landed with fins attached (Biery, 2012). However, based on their performance and contribution during the 2000s, they will for the purpose of this

study be classified as ineffective based on the policies in place during the beginning of this millennium.

On a spectrum, inadequate institutions are the closest to ascribing fishing industries as common goods (Peterson, 2002). The race-to-fish mentality precipitated by access to common goods leads to the tragedy of the commons and the overexploitation of fishing resources including sharks (Hilborn, et al., 2005). The ultimate example of an inadequate institution is the high seas. In the high seas there are no property rights, no enforcement, and no management strategies. Once there, a fisherman can only extract rents by capturing fish before a competitor does so. This incentive, structured by the lack of any formal institution in the high seas, allows shark finning to be prevalent and to the overexploitation of all fish stocks (Jensoft, 2003; Biery, 2012). Nations want to avoid building a model close to that experienced in the high seas. Institutions that prove to be inadequate are the closest to such a model.

Inadequate institutions describes nations with little to no policies regulating the shark fin trade and the act of finning, ineffective or no enforcement of policies implanted, weak or ill-defined property rights in their waters, and they contribute to equivocation of data reporting. There are also informal institutions at play to counter any efforts taken by governments. As management can be expensive and artisanal subsistence fishing is more common in developing nations, residents are more concerned with feeding themselves and employment than the conservation of an animal population (Barker and Schluessel, 2005). There is little environment awareness. If there are management plans in place, they are not being enforced. Not enough activity is at work to properly structure effective incentives. Nations with low economic freedom scores will most likely have inadequate institutions. From Table 1, India, Trinidad and Tobago, Indonesia, Sri Lanka, Iran, Pakistan, and Brazil all exhibit the signs of nations with inadequate institutions and are reflected in their low economic freedom rankings. Developing nations will fit into this category as enforcement of regulations is subject to bribery or simple lack of effort. Also, property rights are not distributed to individuals. In the ocean, even if the government “owns” the water, it is still treated as a common pool by its citizens. Recommendations to correct inadequate institutions will be discussed in a later section.

Ineffective institutions are those that have the strength to instigate change or protection, yet enforce policies that encourage finning. Ineffective institutions arise from the lack of funding for management or political contention from within the nation (Barker and Schluessel, 2005). New Zealand, Taiwan, and Spain, as well as numerous other developed nations, employ regulation dictating a 5% fin-to-body ratio (Biery, 2012). This legislation outlaws direct finning, but allows fins to be removed as long as there is a corresponding body weight ratio. This was enacted primarily in the EU and Canada as a means for the shark fisheries to be able to store the carcasses more efficiently on boats thus promoting yield (Biery and Pauly, 2012). However this universally applied ratio creates a loophole for fisherman to keep finning (Cortes and Neer, 2006). Shark fins do not account for 5% of the total body weight, especially in species that are finned including the Sphyrnidae and Carcharhinidae (Cortes and Neer, 2006; Biery, 2012). When various carcass dressing practices are accounted for, the number of fins begins to grossly out match the bodies. In this type of ineffective legisla-

tion there is still an incentive and ability to fin. Another example of ineffective laws is the employment of subsidies. Shark-fishing industries are often subsidized despite reporting profit losses (Barker and Schluessel, 2005). This creates incentive to not reduce catch or find ways to become economically efficient. Coupled with measures that allow for finning, subsidies detract welfare by siphoning government funds that could be used in more productive endeavors and increase anti-finning pressures.

Effective institutions are far from perfect, but they offer the best potential strategies. Characteristics of effective institutions in the shark fin market include a fins-attached policy, shark sanctuaries, pellucid and effective management strategies, and stronger property rights in their local waters. With the passage of the Shark Conservation Act in 2010, the United States (10th in economic freedom) has moved to the forefront of possessing effective institutions. Though not a shark sanctuary, the United States prohibits the act of finning entirely. Possession of fins, whether to sell or transport, in the United States is subject to heavy fines and all sharks must be landed with fins attached. From the Magnuson-Stevens Act there is also clear and enforced regulation on shark fishing as a whole, including the use of catch quotas (NMFS, 2012) The Bahamas (35th in economic freedom) has also displayed the use of its effective institutions by implementing and enforcing a shark sanctuary (Gallagher and Hammerschlag, 2011). Even if economic freedom is low, nations can still structure effective policy. Egypt (125th) and the Maldives (149th) both were able to decree their water to be shark sanctuaries, and they have been reasonably effective in enforcing it. They were able to accomplish this by enforcing their nations' sovereignty in its own waters from poaching international fishing vessels (Sathiendrakumar and Tisdell, 1987). Both of these nations had incentives to implement shark sanctuaries as sharks provided their economies with ecotourism revenue. All nations should recognize that sharks require protection. The need for protection originates from the sharks' unique biological characteristics.

BIOLOGICAL REPERCUSSIONS

The reason there is such concern over the magnitude of shark mortality from finning, examined from a biological perspective, is that sharks are extremely susceptible to overfishing. It is vital to study sharks' life history stages to obtain a much greater understanding of how shark fisheries would respond to fishing pressures. Economic surplus production modeling, often used in other pelagic stock assessments, requires consistent and reliable catch and catch-per-unit effort (CPUE) data time-series (McAllister, et al., 2008). The paucity of shark fin data degrades this model as an effective management tool. Until data collection becomes more efficient, the thorough demographic models that require biological inputs to measure elasmobranch susceptibility to overexploitation estimate the potential vulnerability of shark populations. Sharks have the characteristic life history stages of K-selective species based on their slow growth rates, late maturity, low fecundity, and great longevity (Hoenig and Gruber, 1990).

When these life history characteristics are parameterized, the intrinsic rebound potential may be calculated. Intrinsic rebound potential is a measure of a population's ability to grow after a disturbance, such as increased fishing pressures. The lower the intrinsic rebound potential, the harder it is for the shark

population to recover. Sharks have much lower intrinsic rebound potentials than that of pelagic teleosts fishes like tuna, which is why there ought to be even more concern for shark populations, even when some tuna populations remain sustainable with higher levels of fishing pressure (Au, Smith, and Show, 2008). Many commonly finned sharks have the lowest rebound potentials, such as the scalloped hammerhead (*Sphyrna lewini*) (Smith, Au, and Show, 2008). Coincidentally many of the sharks that fall on the International Union for Conservation of Nature (IUCN) endangered and threatened list are those that are finned with low intrinsic rebound potential (Dulvy, et al., 2014). Also, sharks are highly migratory and transverse through numerous economic exclusion zones, further exacerbating management efforts as it requires the collaboration between nations.

With their life history characteristics, it is strenuous for sharks to repopulate under the extreme stress caused by such a profligate and unsustainable action like shark finning. However, effects of the removal of sharks are not confined to only their populations. Their absence is disruptive to the structure of entire ecosystems. Sharks are known apex predators, the animals at the top of the food chain, especially the targeted large coastal and pelagic sharks that are preferred for their fins. In a top-down controlled trophic web, perturbations in the apex predator population lead to disruptions of the trophic cascades (Ferretti, et al., 2010). Trophic cascade is the trickling effect of predation on subsequent lower trophic levels. Without the top predators to control the population of the mesopredators (or mid-level predators), the mesopredators proliferate and consume greater amounts of the base of the food chain. The primary consumers are generally essential to maintaining ecosystem structure and are often commercially important species.

The most prominent study on sharks' roles in trophic cascades and potential consequences was done by Myers, et al. (2007) off the eastern coast of the United States. From survey collections of over 35 years, Myers, et al. (2007) found the populations of 14 "great" shark species to be declining rapidly. Simultaneously, the prey populations of these sharks all saw exponential increases. One of the common prey items of these sharks was the cownose ray (*Rhinoptera bonasus*), which feed on scallops and clams in the Chesapeake Bay. With the increase in cownose rays, Myers, et al. (2007) suggested the oyster populations in Chesapeake Bay were greatly reduced by predation from the rays leading to exceptional losses for the oyster and scallop farmers. Also, as oysters play an integral role in water filtration, there were uncalculated indirect economic effects from the loss of ecosystem services. This cascade down to foundation species with the removal of sharks can lead deleterious effects on non-shark-fishing industries.

EXTERNALITIES OF SHARK FINS

The indirect consequences of the removal of sharks on other industries can be classified as a negative externality. Externalities have always been present in fishing industries due to lack of clearly defined property rights and the tragedy of the commons (Smith, 1969). However, identification of the consequences on economic activity outside of the fishing industry has been a relatively recent addition to the literature. This case is even more apparent with the loss of shark

species due to finning. Although literature has begun to identify the repercussions of the removal of apex shark predators and the ensuing restructuring of the trophic levels through trophic cascades, there has been little speculation as to the addition of social cost. Part of this is due to intrinsic difficulties in measuring externalities. Without clearly structured property rights, it is incredibly challenging to identify who ought to pay the brunt of the cost. Also, how much should they pay? The full-scale effects of trophic cascades on base-level economic organisms is yet to fully be measured. More information and understanding of trophic cascading needs to be developed by biologists before economic impact studies can take place. One of the criticisms of Myers, et al. (2007) is that they overestimated the dollar sum value of the loss of oysters, as well not having a sufficient data sample to make such broad sweeping claims (Burgess, et al., 2005). The focus on trophic cascades as a negative shark externality has merit from its ubiquity throughout oceans of the world. As sharks are essential in ecosystem dynamics, identifying some way to connect the loss of ecosystem services and productivity would be an ideal way to shift incentives toward an outcome that generates more social welfare for the community as a whole.

Even though the removal of sharks and the consequences on the productivity of the ecosystem needs further study in order to properly quantify a social cost, there is a clear negative externality for certain nations associated with shark finning. Ecotourism has become a driver for sustainability of pristine environments and species integral to maintaining the biodiversity (Gossling, 1999). In ecotourism, the best way to attract visitors, and therefore revenue, is to keep alluring and captivating animals and habitats healthy. Island nations such as Palau, the Bahamas, and the Maldives recognize this potential more so than other nations. The marginal cost on society is much greater than the marginal benefit gained through finning simply due to the ecotourism value associated with sharks. Therefore these nations have banned the act of finning completely, and some have banned any shark-fishing activity altogether (Biery, 2012). As sharks are a key attraction for divers to travel to these remote nations, they provide in influx of monies into the island economies. This is most noticeable in the island nation of Palau.

In Palau, the revenue a gray reef shark (*Carcharhinus amblyrhynchos*) generates over its lifetime is \$1.9 million dollars or \$179,000 a year (Vianna, et al., 2011). The tourism sharks generate as people desire to see these animals is not confined to just the diving industry, but leaks and dissipates into the rest of the economy in the form of hotel accommodations, tax revenues, and purchasing other commodities during their stay. At average market value for fins and meat, it would take approximately 100,000 harvested sharks to equate to the same revenue for shark ecotourism in Palau (Vianna, et al., 2011). However the harvest of sharks is non-renewable when compared to ecotourism and the harvest of 100,000 sharks would be far beyond the maximum sustainable yield for Palau. When a shark is finned and removed through harvest, the island nation of Palau ceases to acquire the additional revenue stream. That is a loss of welfare for Palau as a whole and adds to the social cost of shark finning resulting in a negative externality. This phenomenon of added value in sharks from ecotourism is not solely in Palau. The reef sharks of the Maldives generate \$33,500 a year, in Bimini this number is enhanced to \$250,000 a year (Anderson and Ahmed, 1993; Hall 1994). These values are not even beginning to accommodate for the added

value of healthy ecosystems and the services provided by them. With those services accounted for, the value of individual sharks will only continue to increase.

INCENTIVE STRATEGIES

It is clear that some nations have found a compelling incentive to reduce their involvement in shark finning. The current rules of the game from the institutions in place in other countries are not sufficient in designing those same incentives. The changes necessary depend on whether a country is developed or developing. There is no one strategy that will correct all the ailments for the different institutions. The most difficult, but perhaps the most influential, task in shaping a new, sustainable direction for the shark fin market is altering the cultural significance attributed in the demand of the market.

The remarkable difference in price between fin and meat entices fisherman to fin (Hareide, et al., 2007). By addressing the informal institutions that place value into the fins, a new cultural outlook will restructure incentives that lower the value of the fins. Manipulating informal institutions is challenging, but education offers the best alternative as it is less intrusive than say a forceful mandate by the government. Recently, efforts by organizations like Shark Truth have been successful in lowering demand for shark fins by asking Chinese new-lyweds to refrain from using shark fin soup during their reception (Shark Truth, 2013). Efforts like this need to continue to eventually remove the inordinate value placed on shark fins.

The ineffective institutions of developed nations need to remove policies currently in place that are inefficient before restructuring incentives to preserve shark populations. First, due to inefficacy, the 5% fin-to-weight-ratio policy needs to be removed and replaced with a fins-attached policy (Cortes and Neer, 2006; Biery, 2012). Secondly, subsidies that promote the overexploitation of sharks have to be taken away (Barker and Schluessel, 2005). With these policies removed, additional legislation can be used effectively. The simple and most straightforward way to reduce shark finning is to flat out ban it, just as the United States did in 2010 with the Shark Conservation Act (Cortes and Neer, 2006; NMFS, 2013). Provided a nation has the effective institutions in place or the ability to transition ineffective policies to such a stance, this is the most effective tool for shark conservation. To limit the overexploitation of sharks as a whole and reduce the chances of finning to occur, property and incentive-based strategies can be utilized (Barker and Schluessel, 2005). The ability of developed nation's institutions to structure incentives is much more refined than those of developing nations. It is for this reason that more comprehensive incentive strategies ought to be employed. Streamlined pricing data will assist the construction of these incentive strategies, as it serves as the knowledge feedback for institutions to assemble appropriate incentives (Jensoft, 2003). From the depravity of shark fin pricing data, incentive-based price instruments may not be sufficient until data is reliable (Sanchirico, 2003). Alternative methods can be used to reduce deleterious behavior, or property rights can be defined more clearly.

The first method that has had success in other fishing industries is the use of individual transferable quotas (ITQs) (Barker and Schluessel, 2005). ITQs define and distribute a set amount of quota from the fishery to be obtained by the individual fishermen and allow for the transfer of rents to more productive

individuals (Hilborn, Orensanz, and Parma, 2005). Through ITQs the race to fish behavior is limited and the tragedy of the commons is eliminated (Hilborn, Orensanz, and Parma, 2005). When fishermen have a stake in the stock, they have an incentive to conserve it for the future. To distribute the rights to the ocean, the government can only prescribe legitimate claims. Auction systems have helped assign equitable distribution of fishing rights in the past (Peterson, 2002).

The second method is especially pertinent to sharks. By-catch rewards or penalties can shape incentives to minimize by-catch. Tuna fisheries in industrial nations often fin sharks as by-catch. In the Bering Sea, the pollock industry employs this system (Pascoe, et al., 2010). Fines and penalties reduce the profit of profligate vessels who catch a prodigious amount of by-catch. The penalties are then redistributed to vessels that are effective at limiting their by-catch. With distinct incentives to reduce by-catch, there is less of an opportunity to fin sharks.

To address the negative externality intrinsic to shark finning regarding the degradation of ecosystems, nations must find some way to correct and adjust the cost to the socially efficient equilibrium. In developed nations, where shark ecotourism is unlikely to bring a significant revenue stream (with the exception of Australia, South Africa, and the Florida Keys), another solution to mitigate the negative externality is to tax the guilty industry. Though a direct tax could limit wasteful fishing behavior, there are questions as to where the government revenue should be spent (Pascoe, et al., 2010). Compensatory mitigation is a method that could simultaneously reduce the incentive to fin from by-catch and fund ecosystem restoration (Wilcox and Donlan, 2007). Ecologically important organisms, like sharks, that are caught as by-catch degrade the environment, leading to costs in other industries. Placing a required compensation amount for every shark caught as by-catch transfers revenue from destructive practices to potentially constructive ones. For example, the compensation payments from by-catch could be used to fund scientific research that designs fishing gear to lower by-catch. This ensures future reduction in by-catch and more sustainable fishing practices. In order for any of the proposed methods to work, management enforcement must be effective.

For developing nations with inadequate institutions, those methods suggested above will be more difficult to implement. Enforcement strength is not on par with that of developed nations. With seven of the top ten producers of shark fin in the world as developing nations, finding a way to alleviate the motivation for finning is imperative. Developing nations in the Coral Triangle and Caribbean have incredible amounts of shark species diversity (Dulvy, et al., 2014). Like in the developed nations, allowing local fisherman a stake in the resource will promote conservation. Foreign vessels rent out rights to fish in some developing nations (Barker and Schluessel, 2005). The government does extract a diminutive amount of rent from these taxes, but the foreign vessels have no reason to conserve the stock as they can simply move to the next site. Foreign fishing vessels treat the resource as a common good and devour rents voraciously. By transferring property rights back to individual communities, conservation through reduction of finning will be achieved, especially where fishing remains part of the subsistence for maritime communities.

The importance of property rights in their ability to constrain involvement of encroaching foreigners is exemplified by the Seri Indians of Mexico. In the

1970s the Seri Indians were granted maritime rights to their traditional tribal territory. The area produces a tremendous amount of bivalves that are sold on the international market. To balance the interest of the community, the tribal council structured laws that required the involvement of local Seris in the fishery, in conjunction to acquiring rights from the government (Basurto, 2005). This structure was effective to cull overfishing as the presence of Seri fisherman and divers with a vested interest in the resource checked the efforts of the outside fisherman (Basurto, 2005). Though this model was for benthic bivalves, encouraging foreign companies to employ locals to act as de facto observers will help ensure the adherence to conservation goals without the ability for strong enforcement measures to take place by a centralized agency.

CONCLUSION

Institutions and incentives matter. How the shark fin market operates is dictated and driven by both. The rising levels of income spurred an engrained cultural practice in China and Hong Kong of purchasing shark fins as a symbol of affluence. Prices spiraled upward from the increase in demand and led fishermen, who were limited on space in their boats, to rationally choose the profit-maximizing outcome to fin sharks. Finning sharks allows for an aberrant and deleterious amount of sharks to be harvested. With their biological characteristics, their populations cannot sustain under the pressure exhibited. When removed from their habitat, sharks are not able to contribute extra value through their facility to attract ecotourism, and without sharks ecosystem services degrade, adding social cost. Revenue loss from these activities is a negative externality in the shark fin market.

To adjust the market to reach the socially optimal equilibrium, institutions need to play a proactive role. Rules in international trading create data paucity that prevents the transmission of knowledge to facilitate signals to the marketplace. From these signals, knowledge derived from the data is used to design effective management practices. There are three echelons of institutions in the supply side of the shark fin market: inadequate, ineffective, and effective. Developing nations generally possessed inadequate institutions for aligning incentives to fit the social equilibrium, and limited, weak enforcement capabilities. Developed nations that had policies in place, but allowed the continuation of finning, were deemed ineffective at attaining the socially optimum level of output. Suggestions to correct these deficiencies have to be separated for the developed nations. Policies and strategies that work for developed nations will not translate well to developing ones due their differences in promoting management, funding conservation efforts, and enforcing policies. For developed nations with ineffective institutions, the first step is to remove unproductive policies, such as subsidies and the 5% fin-carcass ratio, and supplant them with stronger policies. For them to further promote conservation and economic prosperity, incentive-based strategies may be implemented, including compensatory mitigation, by-catch reward/punishment systems, and the use of individual transferable quota. How developing nations respond to the growing concerns of shark finning will be key to determining the course the market will take. As their waters are rich in productivity, they must protect their resources from overexploitation. The best way to do this is to establish property rights that allow local communities to enforce

conservation policy, rather than a large, centralized entity that could become bloated and expensive to manage. Institutions are always changing as people's perceptions change, governments take different courses of action, and new information arises to suggest the possibility of a more desirable outcome. Scientists, economist, and policy makers need to communicate with each other to fuel the process by which institutions can create incentives. This process will be crucial to guiding the course for the future of shark populations.

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Minimizing Insider Threat Risk with Behavioral Monitoring

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Abstract

An insider is a person that has or had a legitimate right to access computing resources of an organization. This definition includes any current or former employee, contractor, customer, or business partner as an insider.

Insider threat is the potential for an individual who has or had authorized access to an organization's assets to use their access, either maliciously or unintentionally, to act in a way that could negatively affect the organization. Insiders may pose a greater threat to cybersecurity than all outside malicious actors combined. The average damage per insider incident is known to be much higher than the outsider attacks, in some instances causing millions of dollars of damage in the form of fraud, sabotage, and the theft of trade secrets or intellectual property. WikiLeaks' disclosures and industrial espionage cases reported by the FBI show the importance of the insider issue.

Until recently, the insider threat did not mean much to the information technology field. As trusted employees or business partners, the insiders were trusted to do what was in the best interest of an organization. Since insiders are already authenticated and inside the system, it is very difficult to pinpoint exactly at what point the insider has become an insider threat.

Contrary to the common belief, most insider incidents are not based on sophisticated hacker tools. Most insider threat incidents are the consequences of human actions, such as mistakes, negligence, greed, or reckless behavior.

Statistical and analytical prediction models and technical security tools, such as anti-virus software, firewalls, and intrusion-detection systems, have not been very successful in predicting the multi-faceted insider behavior. Because of the human factor, a multidisciplinary people-centric approach is needed.

This paper attempts to provide a checklist of best practices against the insider threat by improving the collaboration between the information technology (IT) management and the human resources (HR) department.

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INSIDERS AND THE INSIDER THREAT

What distinguishes an information system (IS) insider from an outsider is his or her current or past association with the system. This definition of an insider includes current and former employees, contractors, customers, and business partners. The term can also apply to an outside person who poses as an employee or officer by obtaining false credentials.

As a federally funded premier research and coordination center for cybersecurity issues, the CERT (Computer Emergency Response Teams) at the Software Engineering Institute of Carnegie Mellon University have recently provided an updated definition of the insider threat. The insider threat is the potential for an individual who has or had authorized access to an organization's assets to use their access, either maliciously or unintentionally, to act in a way that could negatively affect the organization (Costa, 2017).

The insider threat did not mean much to the computer field until recent years. Even after WikiLeaks (BBC News, 2017) and the Snowden cases (Wikipedia, n.d.), most information system budgets and resources are still aimed at the detection and prevention of attacks from external sources. The reasoning is the belief that the insiders, as trusted users, usually do what is in the best interest of the organization.

Unfortunately, whether intentional or not, all insider incidents can have devastating effects on the system.

Intentional Versus Unintentional Insider Threat

The insider threat comes from the abuse or misuse of the computer usage privileges. These privileges are summarized as read, write, and execute privileges for each user or user groups by an operating system. If the threat is intentional, it is called a *malicious attack*. If the intent to harm the organization is missing, the misuse is called *accidental*. Intentional abusers include disgruntled employees, activists, terrorists, organized crime members, competitors, thieves, and irrational individuals. The theft of intellectual property, industrial espionage, sabotage, and terrorism are typical examples of intentional abuse.

In contrast to malicious attacks, most accidental misuses take place because of inadequate training, stress, carelessness, loss of devices, desire to help others, or vulnerability to blackmail or social engineering.

The following are some of the most common insider threat incidents:

- Lost equipment, such as a laptop, tablet, or data disk with sensitive information
- Unauthorized setup of modems, or unauthorized setup of remote access programs or wireless access points
- Use of corporate computing devices for non-business purposes
- Use of personal devices for business purposes
- Use of personal email accounts for business
- Deletion of data files, or accidental disclosure of sensitive material using email or fax
- Use of business email for personal correspondence
- Non-work-related web browsing

- Downloading unauthorized software/media files from unauthorized sites and bringing in malware or spyware
- Accidental unauthorized copying of files to portable storage devices
- Instant messaging using personal accounts

Privileged User as an Insider Threat

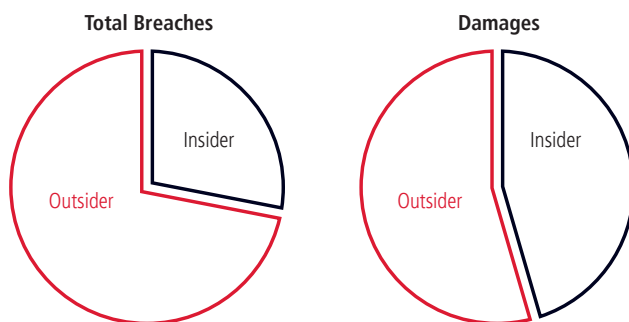
A privileged user is a user who, by virtue of function and/or seniority, has been allocated powers within the computer system that are significantly greater than those available to the majority of users. There are few things these types of users cannot do. Equipped with powerful privileges to navigate many areas of the systems, the privileged users can access many layers of network and operating system without much difficulty, such as changes in hardware and software configurations and file systems.

As expected, the damage caused by privileged insiders is much higher than average insiders (Figure 1). According to a national fraud survey conducted by the Association of Certified Fraud Examiners, the cost of insider attacks to United States businesses is around \$400 billion per year. Of that, \$348 billion can be tied directly to privileged users, according to a CSO Online article (Lovejoy, 2006). The damage by a privileged power user, such as root or database administrator (DBA), can affect the information system as a whole.

The detection and prevention of the damage from this type of power user will be more complicated because they can bypass many of the security controls and can reach the most critical IT assets with ease. By creating fake user accounts, they can delete any trace of their actions.

While conducting these activities, their actions may still look like their authorized day-to-day online activities. Therefore, detection and taking precautionary actions against the IT professional is more complicated.

FIGURE 1. An Overview of Insider Incidents and Damages



Source: SEI. 2014. U.S. State of Cybercrime Survey. Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University.

Non-Employees as an Insider Threat

The insider threat is not limited to the employees of an enterprise. Many legitimate outside users, such as internet service providers, cloud service providers, telephone companies, customers, suppliers, and temporary or short-term personnel should also be considered insiders. Unless properly controlled, all of these groups have the opportunity to reach inside corporate networks and steal unprotected data.

Recent Insider Cases from the Media

Here are some recent security incidents involving various types of insiders:

- *Waymo (v. Uber) claims* an engineer downloaded thousands of files about self-driving car technology and shared with Uber before starting to work for Uber's Autonomous Driving Car Unit (Lawler, 2017).
- *A Ford employee* copied proprietary documents, including some on sensitive designs, to an external hard drive and was arrested at an airport shortly before reporting for a new job with a competing firm in China (FBI, 2011).

- *Two long-time DuPont employees (retired)* stole data for manufacturing titanium dioxide based paint (Wilber, February 4, 2016).
- *A former Fannie Mae employee* installed a logic bomb that (had it not been discovered) would have shut down the information system by decimating thousands of servers (Moscaritolo, 2009).

Other Classifications of Insiders

The success of prevention policies against the insider threat depends on the proper classification of the source. The following lists some of the classifications used by security researchers:

- Employment status of the user (e.g., employees versus business partners)
- Types of assets misuser accessed (e.g., physical versus logical)
- Saboteur or thief: This group will maliciously hack into areas of the IT system to which they shouldn't have access or infect the network purposely from within
- The security softie: This group has a very limited knowledge of security and put their business at risk through using their work computer at home or letting family members surf the Internet on their work computer
- The gadget geek: Those that come to work armed with a variety of devices/gadgets, all of which get plugged into their PC
- The squatter: Those who use the company IT resources in ways they shouldn't (e.g., by storing content or playing games) (US-CERT, n.d.)

Each of these classifications can be analyzed further in greater detail. For instance, the employment relationship may be classified further as current versus former, temporary versus permanent employees. Insiders, who do not have an employee status, can also be looked at: customers, contractors, and business partners. Similarly, the accessed assets may also be grouped as hardware, network, or data and intellectual property. The harm done may also be grouped as fraud, theft of intellectual property, cyber sabotage, and spying.

HIGHLIGHTS FROM THE U.S. CURRENT INSIDER SURVEYS

The CERT Division of the Software Engineering Institute at Carnegie Mellon University, in cooperation with the U.S. Secret Service and the FBI, conduct some of the most comprehensive cyber security surveys for the United States on an annual basis. The result of the interviews with hundreds of IT professionals are published in their websites. The following is a summary of significant findings from recent surveys on the insider threat:

- Approximately half of the organizations had some insider security incident every year between 2002 and 2014.
- In other words, the insider incidents are common occurrences (CERT 2014).

TABLE 1. Most Common Damages from the Insider Incidents

Stolen or compromised confidential information (such as trade secrets or intellectual property)	32%
Stolen or compromised customer information	33%
Stolen or compromised employee records	40%
Unintentionally exposed private or sensitive information	50%

Source: SEI. 2016. U.S. State of Cybercrime Survey. Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University.

- Even though hacker incidents outnumber insider incidents, the insider incidents are equally dangerous. The insider incidents are costlier on a per-unit basis. The average damage was estimated to be \$412,000 (Richards, 2013).
- In financial terms, the aggregate damage caused by insiders is close to the aggregate damage caused by hackers. In several instances, damages reached more than \$1 billion (Richards, 2013).
- The typical insider threat is the violation of confidentiality and privacy, such as looking at payroll data. Approximately three-quarters of the insider incidents are related to revealing employee and customer records. The second most damaging common insider incident is the theft of trade secrets and intellectual property (see Table 1). One-third of the firms interviewed reported either stolen intellectual property or customer-related data.

PREDICTION AND DETECTION

Business organizations try to protect themselves by predicting the insider incidents before an incident takes place. Predicting the insider incident means predicting who will turn against his or her organization. Unfortunately, there is no single answer why some people turn against their own interests or their own organizations. Many attempts to preempt the multi-faceted insider incidents have not been successful.

There are two alternatives: technical and behavioral monitoring, or a combination of the two. Some organizations prefer technical monitoring tools, e.g., NetFlow from Cisco; others use a behavioral monitoring approach to keep an eye on the insiders (Cisco, 2018).

Technical Monitoring

Utilizing advanced monitoring software, artificial intelligence, and machine learning techniques, enterprises can analyze critical data across the entire enterprise, establish baselines of normal behavior, and identify anomalous activities and outliers.

The following is some popular technical monitoring topics against the insider threat:

- Unauthorized copying of files to portable storage devices
- Large or unusual quantities of data leaving an enterprise through email or fax
- Downloading unauthorized software, data, or media content

- Changes in data access patterns e.g., frequency, time, and location
- Failed authentication attempts
- Unusual attempts to retrieve data from backup or archive
- Changes in protocols used, unexpected or unusual command usage
- Unauthorized setup of remote access programs, modems
- Use of personal computing devices for business
- Using business computers for personal use
- Using personal email accounts for business, or using a business email account for personal correspondence
- Unexpected sharp increase in print jobs
- Unauthorized privilege escalation
- Modification or deletion of audit logs
- Unauthorized deletion or modification of data and log files
- Changes to the system infrastructure

The success of technical monitoring depends on an IT infrastructure built on the principles of *need-to-know*, *least privilege*, and *segregation of duties*. Based on these principles, the organization should be aware of *privilege creep*. When an employee is assigned a new role, the privileges of the previous role should be taken away after a short transition period. Each user's privileges should be reviewed at least once a year. Only the privileges directly associated with the current title and responsibilities should be given to each insider.

Behavioral Monitoring

The behavioral monitoring focuses on the insider. In contrast to common belief, the malicious insider is not a hacker equipped with special sophisticated technical tools. Most malicious insiders do not use any fancy technical tools. These are people doing authorized things with malicious intent. The traditional technical tools will fail to detect these incidents in a timely manner. The respondents of the CERT surveys usually admit that even after an incident, a large percentage of sensitive material and intellectual property (IP) thefts are discovered after notification from the FBI (Cushing, 2017). The FBI also admits the risk from the insider threat is not technical, it is people-related, suggesting a behavioral monitoring approach. Previous FBI efforts to predict the malicious behavior with statistical models and technical monitoring did not fare well. Because of complications in determining the human motives and behavior, the technical monitoring tools should be complemented with behavioral monitoring tools without violating the local regulations about privacy (Dark Reading, 2013). The discontent at the workplace seems to be one of the most significant motives for the intentional privilege misuse. Layoffs, demotions, pay cuts, delayed promotions, or other management practices deemed to be unfair, provide the necessary justification for privilege misuse by a disgruntled employee, retiree, or business partner. An employee who did not receive promotion or recognition may be tempted to misuse his or her privileges or knowledge to reach sensitive materials. Stealing and selling confidential information may be considered revenge by the disgruntled

employee. For instance, the theft of DuPont's trade secret white color, based on retiree disclosures made many years after their retirement shows how strong feelings can be (Wilber, February 4, 2016). As we have seen in the Edward Snowden case, ideological differences may also lead to revealing confidential information.

In general, any negative change in the behavior of an insider should be a concern for management. As one may notice, most of these behavioral topics are in HR territory. Below is a list of significant behavioral indicators that should be shared by the HR department:

- Sudden change in financial status: sudden wealth or sudden excessive debt
- Recent legal restraining orders
- Wage garnishments
- Alcohol, drug dependency
- Disregard for authority and accepted practices
- Attempts to circumvent security requirements
- Unusual business or personal travels
- Association with hostile groups, and social media indicators
- The degree of dissatisfaction with their work
- Mental instability
- Major life events
- Negative reviews

TABLE 2. Most Common Forms of Unintentional Insider Incidents

Social engineering	21%
Laptops	18%
Remote access	17%
E-mail	17%
Copy of data to mobile device	16%

Source: SEI. 2014. U.S. State of Cybercrime Survey. Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University.

With accidental misusers, a desire to help others, careless or reckless use of the information system, lost equipment, and vulnerability to social engineering are some of the leading reasons. In the context of information security, social engineering is defined as tricking people into divulging confidential or personal information. According to the CERT report, 21 percent of the fraudulent attacks were initiated by social engineering or taking advantage of human nature to be helpful to a friend or colleague. Stolen or lost laptops (18 percent) as well as downloading data, media files, or software from unauthorized websites are also common causes of insider threats (Table 2).

Popular Responses to the Insider Threat

As expected, because of perceived difficulties in winning a conviction and other financial concerns, many insider incidents go unreported. To win in court, U.S. companies must prove that they properly safeguarded their trade secrets, something many fail to do. In some instances, companies worry that disclosing an industrial espionage case will hurt their stock prices, harm relationships with their customers, or prompt federal agents to put them under a microscope (Wilber, February 8, 2016). Therefore, very few cases of the insider incidents are reported. We can easily assume that the published statistics underestimate the actual numbers of the insider incidents.

The following are the statistics, derived from the CERT reports, showing how most insider attacks are handled by U.S. firms (US-CERT, n.d.).

- Approximately three-quarters of the insider incidents are handled internally without any involvement by the law-enforcement authorities. Only 10 percent of the cases were deemed to be “some kind of internal legal action.” When asked about why they did not prosecute the insiders after a security breach, a third of the respondents claimed that incidents were found to be insufficient to warrant prosecution, or there was not enough evidence to identify individual(s) behind the incident. Another popular cause for handling the issue internally was the concern about the negative publicity and the competition’s use of the information to their advantage.
- Overall, only 15 percent of the cases were deemed to be worthwhile to process further outside the organization. External law enforcement agencies were informed in 12 percent of the cases. In only 3 percent of the cases, there were civil proceedings against the user.
- Despite the pervasiveness and persistence of insider incidents, less than half (49 percent) of organizations reported having a formal plan for responding to insider incidents. Eleven percent of organizations did not have any response mechanism for insider security events (Table 3).

Best Practices for Deterrence

Firing an employee is one way to deal with the insider incident.

Unfortunately, as various CERT surveys over the years have indicated, the IT administrators cannot figure out what really happened in half of the insider incident cases. Proving who did what is another difficult issue for the respondents. Before discovering all the facts behind an insider incident, starting the termination process would increase the risk of expensive litigation. Therefore, it is often better to remediate than to make a quick termination.

The starting point for remediation should be to ensure all insiders, including employees, customers, and other business partners, understand organizational policies regarding use of the system. When a new user account is created for an employee or a business partner, there should be security training. The current employees and business partners should be subject to similar training at certain intervals. Employees should be trained to detect or notice suspicious activities. The consequences of policy violations should be clearly stated, and a signed document should be collected from each participant of the annual training sessions.

An anonymous tip line may encourage employees to report suspicious activities of colleagues when they are not sure. We should remember that most major security violations usually start with small, innocent-looking “accidental” violations. If there is no immediate response from the security management, the violations may get more serious. Any delay in responding will tempt the user to experiment further to test the grounds for bigger violations. To stop

TABLE 3. Most Adverse Consequences of Insider Incidents Reported by the Respondent

Loss of confidential/proprietary data	11%
Reputational harm	11%
Critical system disruption	8%
Loss of current or future revenue	7%
Loss of customers	6%

Source: SEI. 2014. U.S. State of Cybercrime Survey. Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University.

the growth of the violation into a bigger violation, any rule violation should be responded to quickly.

To eliminate the chances for accidental disclosures of sensitive material, and to improve information sharing, some organizations employ a color-coded mechanism called *Traffic Light Protocol (TLP)*. TLP is a simple, intuitive schema for indicating when and how sensitive information can be shared. For instance, a red symbol indicates that the recipients of this information may not share this information with any parties outside the specific meeting or conversation in which it was originally disclosed. Similarly, an amber symbol indicates that the recipient of this information can share it with members of their own organization, and with clients or customers who need to know the information to protect themselves or prevent further harm (Schneier, 2005).

According to the U.S. Computer Emergency Readiness Team, TLP definitions are:

TLP:RED	Not for disclosure, restricted to participants only
TLP:AMBER	Limited disclosure, restricted to participants' organizations
TLP:GREEN	Limited disclosure, restricted to the community
TLP:WHITE	Disclosure is not limited

The following is an additional list of best practices to deter the insider threat and limit the potential damage (Cappelli, 2012):

- Identify high value and sensitive data and processes. Restrict access to sensitive, high-value data.
- Develop and implement insider threat policies and procedures with the help of human resources, legal counsel, security, and internal audit departments. Establish an insider threat group to maintain a readiness state.
- There must be an enterprise-wide policy for new accounts and strong passwords. Multi-factor authentication should be implemented and password files should be encrypted. Password sharing must be prohibited.
- New employee, contractor, and partners should be trained regularly in security awareness. There must be periodic changes in passwords.
- After a background check, all new employees, contractors, and business partners should be required to sign a nondisclosure agreement before they start working for the enterprise. In case of mergers and acquisitions, similar steps should be taken for the newly joined employees, contractors, and business partners.
- When an employee resigns or retires, an exit interview must be conducted. When a privileged user, such as system administrator or DBA, is terminated, he or she should be escorted out of the building immediately and all accounts associated with that user, especially the remote access accounts (including the cloud services), should be frozen immediately.
- All recent outgoing emails, attachments, print jobs, and downloads of the terminated employee should be reviewed carefully.

- The distribution of the company-owned equipment to various users should be documented, and when the employment is terminated, they should be returned.
- The help desk should not create new accounts.
- There must be a record keeping for the accounts reset, and these records should be reviewed.
- There must be restrictions to access the system in terms of time and location. Time and location of each access, and the process employed for each person (e.g., printing), should be logged.
- Backup tapes and backup processes should be limited to certain IT personnel. After encrypting, the backup media must be stored off-site. The encryption keys should be maintained in a secure location. The transportation of backup data and restoring from the backups should not be handled by the same persons. The effectiveness of the backup and restore functions should be tested regularly.
- Remote access and use of personally owned devices should be prohibited. Use of devices with cameras should be forbidden in sensitive areas.
- When there is a change in job definition or role, the access privileges should be re-evaluated to prevent privilege creep. Privileges should be determined on the need-to-know basis for each job and role.
- The privileged users, such as system administrators, should use different accounts when they perform non-privileged work. Activities of privileged workers should be monitored carefully. Use audit logs to detect the activities of employees outside their normal scope of work.
- An easy-to-use, anonymous reporting system for suspicious activities should be established.
- Annual refresher training on system security and insider threat should be provided for employees, especially senior management, contractors, and partners. The consequences of policy violations should be stated clearly.
- The enterprise-owned physical assets, and their ownership, should be maintained. The type of data or processes that can be employed on those devices should be specified.
- The data on all company-owned mobile devices should be encrypted.
- The rule for data and process ownership should be determined at the departmental level. Access rights to the data and processes should be determined by the data owner, not by IT.
- The required segregation of duties should be determined by the data owner.
- Periodic credit checks of employees should be used to identify the changes in the financial situation of employees. Within the boundaries of privacy laws, the human resources department should notify related managers when an employee's life situation (such as drug addiction or bankruptcy, etc.) deteriorates.

- Management should avoid favoritism, discrimination, and injustice in promotions and opportunities for growth.
- If a service provider is used, the service provider's security practices should exceed or improve the organization's own security practices. In simple terms, the use of a service provider, including the cloud service provider, should not add an additional risk to the organization.
- Any changes in the information system, e.g., network and hardware configurations, updates to operating system and applications, should be reviewed by system administrators, data owners, and users before they are implemented.
- The computer network must be monitored to establish what is normal behavior for an intrusion-detection system (IDS).
- Determine the ports and protocols needed and used regularly. Routers, modems, and firewalls must be configured to meet these demands.
- The virtual private network (VPN) access should be granted for certain hours and certain applications. The VPN access to foreign countries should not be given if there is no legitimate business need.
- The use of social media must be regulated within the scope of the existing legal system. A training program for security procedures, including teaching the risks associated with the improper use of the social media, must be provided to all users. An easy-to-use mechanism to report suspicious activities on social media must be established.
- The use of printers, scanners, fax machines, and copiers should be monitored.
- The use of certain data transfer mechanisms, such as FTP, should be restricted and anomalies should be reviewed.
- If there is no need for the transfer of data to other systems, the removable media should be eliminated. Printing or downloading sensitive documents should be restricted and monitored.
- Highly sensitive information should only be available at certain locations. Outside pre-specified locations, the encryption key should not be functional.
- There must be an enterprise-wide risk assessment of all systems, data, and processes, including the service providers.

CONCLUSION

Except in rare instances, the typical insider threat is a result of sophisticated technical hacker tools. Whether intentional or not, most insider incidences are either misused or abused privileges by a human being. Therefore, a human behavioral detection methodology is needed to understand the logic of the insider. In this aspect, collaborating with the HR department can provide the information needed by IT managers. With training provided by HR, IT managers can learn to notice how psychosocial factors—like a stressful divorce, difficulty working with others, or retaliatory behavior—may affect the insider threat.

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Regional Growth and Transportation Infrastructure from Greenways to Public Transit

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Abstract

Tourism-based economies throughout the world are experiencing a surge in growth, driven in part by decreases in travel costs, increases in the average time available for leisure, and decreases in information costs. In the warmer climes, demographic forces, economic factors, and natural amenities have driven migration from colder, higher-cost-of-living regions. Migration and tourism have stimulated the transformation of landscape, economy, and culture for many of these growing destinations. As these regions grow, rising competitive forces foster innovation and new opportunities to leverage the traditional recreational amenities of the beaches, mountains, lakes, rivers, golf courses, and parks. The rapid spread of information changes expectations, and preferences evolve. The growth does not come without negative consequences; congestion increases, wear on infrastructure hastens, green space diminishes. Sustainable economic development does not ignore these consequences; it requires investment in capital, sound infrastructure, and the cooperation and commitment of private and public stakeholders.

This study considers new and existing infrastructure improvements and their impact on traditional and nontraditional amenities in a tourist region. Service enhancements to public transportation, expansion of multi-purpose bike and walk paths, increasing awareness for state and local parks, and improved access to beaches and shopping are considered as an amenity service bundle available to consumers/households who weigh the accessibility cost of such ame-

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nities against all other goods available within a constrained budget set. Recreational consumers, residents, business owners, and policymakers benefit from increased efficiency of public goods production to the extent that these investments increase the utility derived from amenity consumption, given a fixed level of expenditures per capita on the public good.

Seminar students studying urban economics at Coastal Carolina University (CCU) conducted research for two distinct infrastructure programs in the heavy tourism region in and around the Myrtle Beach, South Carolina metropolitan statistical area. The first case considers enhancement and expansion of multi-purpose recreational paths tying into the East Coast Greenway along the metro area's suburban fringe. The second case analyzes public transit operation across the metro area, identifying opportunities and challenges to efficiency-enhancing improvements. We present results and recommendations from these analyses.

INTRODUCTION

Urban theory explains how the monocentric city, prevailing until the early twentieth century, has experienced decentralization or suburbanization, notwithstanding the dense urban core still present for the largest cities around the world. Urban renewal is often successful in these legacy cities, built long before the automobile reduced commuting and transport costs to and from central cities. On the other hand, the New Urbanist paradigm aims to confront the suburbanization of modern growth cities, ever expanding with the mass appeal of the automobile. How do New Urbanist principles fare in suburban market applications? Do households prefer dense urban environments more than their spacious suburban landscapes and private commutes? Furthermore, as a matter of economic efficiency, as public transit is less efficient and walkability is lower—the more a region is sprawled—are these economic realities too daunting for smart growth reform?

New Urbanism confronts urban sprawl with appeals to smarter development methods incorporating greater density, increased walkability, and a reduced impact on the environment. Many urban theorists, on the other hand, regard sprawl as the result of a natural evolutionary process driven by consumer choice and increasing over time. Mieszkowski and Mills (1993) show the general flattening of the urban density gradient in the United States and around the world due to the spread of innovations including automobiles and technology. Jobs and people have moved out of the central cities in increasing numbers over time. According to Mieszkowski and Mills, 57 percent of people and 70 percent of jobs were located in the central cities of metropolitan statistical areas in the 1950s. By 1990, only 45 percent of jobs were located in central cities, and the ratio has continued to fall. U.S. Census estimates for the 52 major metropolitan areas show less than 20 percent of jobs were located in the urban core or central cities by 2014 (Cox, 2016), suggesting sprawl does not necessarily imply increased commuting costs because commuting no longer generally aims toward a singular central business district.

Brueckner (2011) summarizes the essential theory and empirical findings relating population density and distance from the central business district

(CBD). Because housing consumers bid up the price of housing closest to the employment center and producers of housing and office space do the same, land price increases at the CBD. For consumers, there is a tradeoff between housing consumption and all other goods. The result is more, but smaller, residences on less land closer to the CBD, creating greater population density. Farther from the CBD, fewer structures of any use on more land results. Add to this the changes in transportation technology over the centuries, and we find an ever-expanding radius to the suburban/agricultural fringe. Efficient provision of public transit and walkability likewise decline with these outcomes. The economics are often too daunting for public transit, generally requiring massive public subsidies for survival. Walkability, on the other hand, may suffer more from overgeneralizations than from pure economic infeasibility. Finding a Starbucks at the back of a cul-de-sac in a suburban neighborhood is unlikely, but green spaces accessible via multi-purpose paths and safely designed streets to enhance the value of these amenities has become a profitable offering for housing developers throughout the United States. This complements New Urbanist calls for healthier lifestyles and increased community interaction supporting positive neighborhood externalities.

Urban theory provides a rigorous economic construct useful for the analysis of New Urbanism in practice and application of New Urbanist reforms. We choose two aspects and show how urban economic theory can help increase the likelihood of successful implementation, measured as marginal improvements. We present two specific case analyses for a small, rapidly growing metropolitan area incorporated in the mid-twentieth century along the coast of South Carolina. In 2016, senior seminar students studying economics at Coastal Carolina University (CCU) conducted research for a community organization and a regional transportation authority in the region. Both studies concern the growing transportation challenges of the region. One focuses on the recreational demands of a community's residents, while the other examines the viability of a public transit system and its commitment to serve the seemingly divergent needs of tourists and residents.

The first study evaluates infrastructure investment necessary to integrate two important natural amenities defining a community located along the 3,000 mile trail system stretching from Maine to Florida known as the East Coast Greenway. The unincorporated community of Murrells Inlet is bounded by the Atlantic Ocean to the east and the Waccamaw River section of the Intracoastal Waterway to the west. A proposed bike path just over four miles long would link the waterway to the East Coast Greenway, connecting to bike lanes in the Murrells Inlet restaurant district which currently lead to a 2,500 acre state park with beach access just south of the community. Legal, fiscal, environmental, and governmental challenges confront the unincorporated community. The case focuses on the economic valuation of the project.

The second study concerns a broader subject for the region. The Coast Regional Transit Authority (RTA) asked CCU to identify new potential public funding sources and research opportunities for operational improvements. The study examines transit through the lens of urban consumer theory and benchmarks the Coast RTA against other transit systems to provide straightforward recommendations for feasible improvements.

BENEFIT-COST ANALYSIS OF A PROPOSED GREENWAY EXPANSION IN MURRELLS INLET, SOUTH CAROLINA

Case 1 considers the challenge facing an unincorporated, rapidly growing community along the southeastern coastline of the United States. Lacking a formal government, a non-profit organization has been given the responsibility of stewarding sustainable development and preservation of the community. Annual surveying of residents' preferences for community and economic development initiatives lead the organization to propose a significant bike path revitalization and expansion project. The effort would upgrade existing bike lanes with renewed labeling and signage, clear striping, and reflective globes. New bike paths would connect the existing lanes along the sea marsh to the paralleling Intracoastal Waterway. A well laid-out bike path would increase accessibility to existing activities, improve the recreational experience of the natural amenities, and provide other healthy lifestyle benefits and economic diversity.

The seaside community lacks a traditional business core. In-migration to the region has consisted of retirees, and more recently, younger professionals serving the growing needs in health care and higher education, two industries experiencing robust growth in the last decade. The community is best described as suburban. The hedonic model of housing prices suggests the amenity-based infrastructure would be capitalized into housing values.

The projected cost of the path is approximately \$1.5 million according to the Earthworks Group, a local planning and engineering firm. It would establish a new multi-purpose path, four miles long, connecting the major business route and restaurant district along the sea marsh with the major business bypass servicing a health care cluster and other businesses, and finally extending to the river/Intracoastal Waterway where it would terminate at an existing marina. The project would also upgrade existing bike lanes to improve safety and awareness. In line with other studies of the net benefits of infrastructure and amenity improvements in residential communities, we apply a property valuation methodology to estimate the economic impact of the completed project and its implicit value for tourists and residents. We weigh the economic benefits against the direct construction costs to determine a net benefit-cost ratio. We summarize the estimation and intuition in what follows.

Research on the economic value of parks and green spaces is becoming more abundant. Rigorous studies extend the generalized models of land value and urban consumer choice theory. For a broad review of the literature, see a study from the Trust for Public Land's Center for City Park Excellence (2010) and Lindsey, et al. (2004). Correll, Lillydahl, and Singell's (1978) seminal study in *Land Economics* provides the intuitive argument for economic rents owing to proximity to public amenities, such as vistas or open space, and they present empirical evidence supporting this hypothesis. They distinguish public from quasi-public goods and argue that quasi-public goods are likely to generate positive economic rents capitalized into house values. Quasi-public goods are somewhat rivalrous, so that proximity may yield greater accessibility benefits revealed through a higher willingness to pay in market transactions. Lindsey, et al. (2004) provide a taxonomy of values of greenways along with recommended valuation methods for each type of use. These types of use have been documented and analyzed in various studies (Table 1).

TABLE 1. Taxonomy of Values and Explanation

Type of Use/Benefit	Value Explanation
1. Recreation	Walking, jogging, cycling, skating, nature
2. Property	Higher willingness to pay for properties with accessibility to trails or green space
3. Health/fitness	Health benefits from use that generate cost savings from health care prevention and less loss of work time
4. Transportation	Alternative commuting route
5. Ecological	Environmental quality support and preservation of species dependent on green space
6. Amenity/aesthetic	Non-owners of property benefit from views or vegetation
7. Economic development	Enhances tourism and commercial investment/development

Source: Lindsey, G., Man, J., Payton, S., Dickson, K. 2004. Property Values, Recreation Values, and Urban Greenways. *Journal of Park and Recreation Administration*, 22(3), 69–90.

Subsequent studies have considered the economic value of established multi-use paths. Lindsey, et al. (2004) present results from two complementary techniques capturing property value from hedonic analysis and recreational value revealed through survey analysis applying the travel cost method. Their findings suggest marginal values depend on location, demographics, neighborhood conditions, and other factors. Their hedonic analysis of over 9,000 residential property transactions in Marion County, Indiana predicts a 2.4 percent increase in value for properties in close proximity to multi-purpose paths and as high as 14 percent for other conservation corridors not necessarily featuring paths.

For our hedonic-based estimation, we employ a conservative factor of 5 percent for the increase in property value using only properties directly adjacent to the proposed path. Our rationale considers the demographics, tourism economy, and natural amenity environment anchoring the local subject area. We limit our analysis to 199 properties located directly along the proposed path. Property tax records of these properties reveal a last sale price median value of \$176,375, without adjusting for inflation. Assuming the 5 percent marginal contribution to value, the median price would increase \$8,819. Valued at the median, 199 properties would show an aggregate increased valuation of \$1.76 million. This partial valuation estimate exceeds the cost of the path's construction.

The recreational value for tourists and local users also factors into the benefit-cost analysis. We must project this value based on similar studies of existing paths. Siderelis and Moore (1995) evaluated the recreational value for three multi-use paths using the travel cost method. This method assumes leisure time is chosen over work time, and hence is valued at the hourly wage of the typical user; see also Bowker, Bergstrom, and Gill (2007) for more on accepted methodologies and studies. To apply this method, Siderelis and Moore conducted surveys of users to quantify time on trails and frequency of use. Aggregating, they found a range of benefits per mile in inflation-adjusted dollars, of \$291,484 to \$994,201. The low estimate was for a trail system 26 miles long in Dubuque County, Iowa. The high estimate was for a system 7.6 miles long in north Florida. A middle estimate, \$481,485, was for a 16-mile system near Oakland, California. Using the low estimate and a length of four miles for the bike path extension in Murrells Inlet, we estimate a recreational value impact of \$1.2

million annually. Summed with the \$1.76 million real estate impact, we have \$2.96 million of net benefits against \$1.54 million of cost, for a benefit-cost ratio of 1.96. A ratio greater than zero suggests the project is economically efficient.

The case presented a practical application of the relevant theory and empirical work on nature-based amenities and valuation for policy purposes. Previous studies demonstrate how the connection of traditional and nontraditional amenities with new and existing infrastructure improvements enhances the economic and cultural value of communities. Properly planned and constructed multi-use greenways complement existing transportation infrastructure and locational amenities to increase awareness, accessibility, and use of state and local parks, beaches, restaurants, shopping destinations, and other businesses and services. Recreational consumers, residents, business owners, and policymakers benefit from the increased efficiency of public goods production. Sometimes referred to as “smart growth” strategies, these investments should incorporate the diversity and culture of the tourism region, enhance the sustainable development of its communities, the quality of life for its residents, and the region’s overall economic vitality.

ADDING VALUE TO REGIONAL TRANSIT SYSTEMS IN A SEASONAL TOURIST DESTINATION

Our second case concerns a broader transportation and public good subject. We examine mass transit through the lens of urban consumer theory and present a benchmark analysis of several regional transit authorities along the coastal South Atlantic region, focusing recommendations on one system serving the Myrtle Beach MSA, otherwise referred to as the Grand Strand. The Grand Strand is a major warm-weather family vacation and golf destination in the upper coastal region

of South Carolina, spanning sixty miles from the southernmost city of Georgetown to the northernmost town of Little River, with one major divided highway corridor bisecting from the city of Conway, approximately fifteen miles inland, to the northwest, as shown in Figure 1.

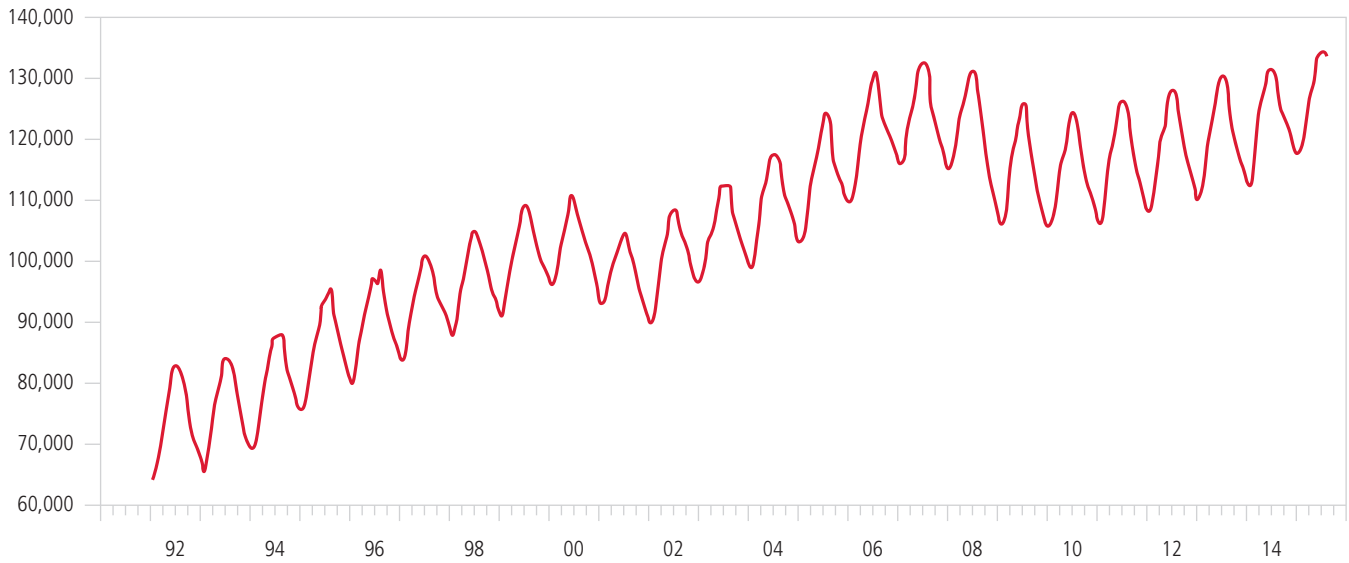
The peak tourist season ranges from Memorial Day to Labor Day, consistent with the “summer vacation” season for K–12 schooling in the United States, while the golf vacationers, significantly fewer in number by comparison, concentrate visits during the cooler months of spring and fall. This seasonal pattern affects employment levels directly for the two counties, with peak employment in the summer months and bottom levels in the winter months as shown in Figures 2 and 3. Naturally this affects demand for public transportation and should be accounted for in operational models.

The resident population of this rapidly growing two-county region has nearly doubled since 1990 to just over 370,000. On top of the residential growth, estimates of annual visitors to the region have grown to 17 million people per year, with the majority of these visitors crowded

FIGURE 1. Map of the Grand Strand



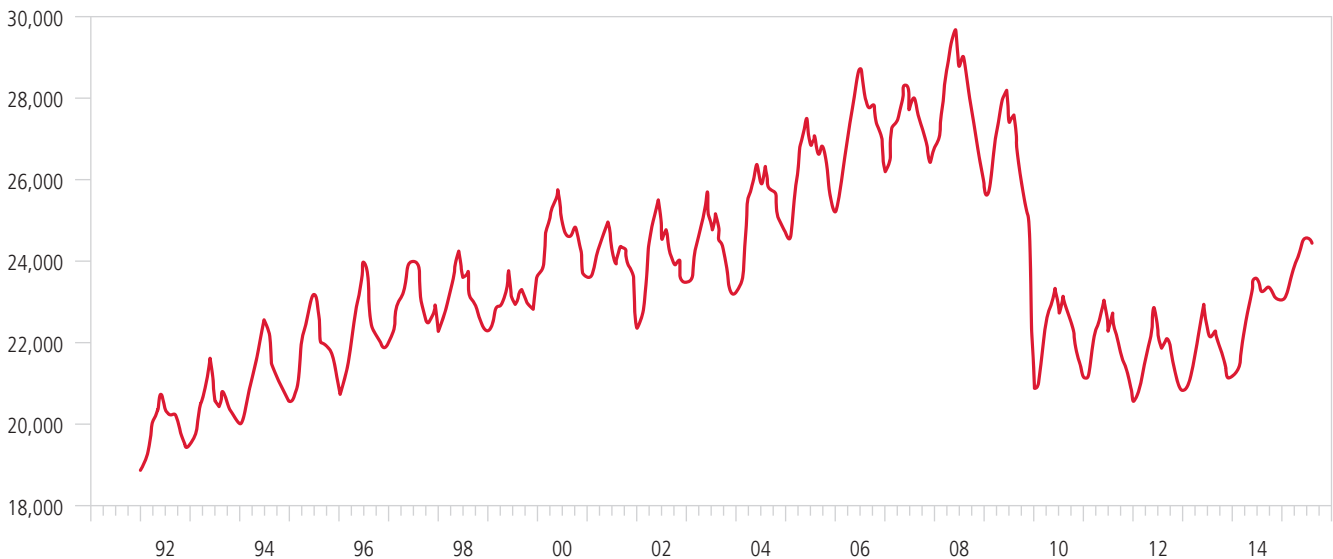
FIGURE 2. Horry County Seasonal Monthly Employment Trend



Source: Local Area Unemployment Statistics, Bureau of Labor Statistics.

into the summer months (Myrtle Beach CVB, 2016). The population and growth varies drastically from the north to the south of the region, as shown in Table 2. Horry County, the larger of the two counties in terms of population and land area, has more than doubled in size since 1990 to just over 309,000 in 2015, and is over five times the size of Georgetown County. Perhaps more importantly, the county seat of Georgetown has lost population in the last 25 years as the manufacturing industry as a whole has become more capital-intensive and competitive globally. These differences in the growth experience across the region have direct implications for the delivery of efficient and effective public transit serving the entire region.

FIGURE 3. Georgetown County Monthly Seasonal Employment Trend



Source: Local Area Unemployment Statistics, Bureau of Labor Statistics.

TABLE 2. Population and Growth 1990–2015

Location	Population 1990	Population 2015	Change	% Change
Horry County	144,053	309,199	165,146	115%
Georgetown County	46,302	61,298	14,996	32%
Total	190,355	370,497	180,142	95%
Georgetown (City)	9,774	9,062	(712)	-7%
Conway (City)	10,158	21,053	10,895	107%

Source: U.S. Census.

The Coast Regional Transit Authority has the responsibility for providing public transit services in the study region. Recurring budgetary challenges for the Authority are well-documented, including the latest federal audit in September of 2016 (Hudson, 2016). Economic challenges are reflected in the geography, seasonality, and population demographics; however, administrative and operational improvements are also necessary if the service is expected to play a more significant role in support of the transit and workforce demands of the region. An exhaustive analysis of these facets is beyond the scope of the present study; however, we can highlight important gaps and opportunities in service by benchmarking Coast RTA against neighboring regional transit systems.

Public transportation may benefit areas in multiple ways. The American Public Transportation Association (APTA) lists the following: congestion reduction, abatement of energy uses, reduction in air pollutant emissions, decline in the need for expensive personal vehicle parking structures, reduction in roadway injuries, fatalities, savings in road construction and maintenance costs (APTA, 2016). Highly functioning transit systems can provide greater access to jobs, medical facilities, parks, recreation, and social engagement. These benefits help explain investment in public transit; however, attaining a critical mass utilization rate depends on the size and density of the region. Costs per rider increase as distance grows and population density falls. Urban economist Arthur O’Sullivan summarizes practical ratios to help determine break-even densities for various mass transit services. Recommended densities suggest very few metropolitan areas in the United States can operate at break-even or better (O’Sullivan, 2007, p. 241 citing Holtzclaw, 1994). The expansive, linear-oriented geography and low population density of the Grand Strand are especially challenging factors. Nevertheless, marginal improvements are a worthwhile objective, and benchmarking against neighboring systems facing similar constraints may suggest such opportunities.

We have chosen three neighboring systems for the benchmark analysis: WAVE Transit of Wilmington, North Carolina; Emerald Coast Rider of Destin, Florida; and CARTA of Charleston, South Carolina. Considerations include whether each system accounts for seasonality in demand, service level offered as measured by routes, number of buses and bus drivers utilized, annual ridership, the service area population and geography, price scheduling, and operational expenditures.

Neighboring System 1. WAVE Transit—Wilmington, North Carolina

Cape Fear Public Transportation Authority operates as WAVE Transit in Wilmington, North Carolina. WAVE’s Director of Planning and Development provided

the CCU economic team with information on this system. She was able to provide information on ridership statistics, employees, and input on whether or not WAVE accounts for seasonality. WAVE transit operated 35 fixed routes serving an area with a population of 216,479 at the time of this study. To operate these routes and buses it employed 81 bus drivers. In 2014, records indicate 726,209 people used the WAVE transportation system. WAVE charged a \$2.00 fixed price for each rider. In 2015, WAVE was able to generate \$2,563,080 in operating revenue. Forty-five percent of operating revenue came from ride fares, while the remainder came from ride contracts for service to local organizations. In comparison, Coast RTA reported operating revenue of \$570,750 for FY 2015, with zero revenue from contracts as reported in their October 2016 Board Packet (Table 3).

Contract revenue is a strength of WAVE Transit. Another is its adoption of compressed natural gas (CNG) buses. Since CNG is recognized as an environmentally friendly alternative to gasoline, the federal government provides a \$0.50 per gallon tax credit available to users of alternative fuels, including CNG (AFDC, 2016). By using CNG they have been able to reduce fuel costs while minimizing their carbon footprint. Efforts such as these provide some explanation for the large difference in federal and state grants received between the two authorities. WAVE Transit generated approximately \$6 million in grant revenue in FY 2015, while Coast RTA generated approximately \$3.3 million.

The operational inefficiencies only magnify the greater obstacle of low population density. The greater Wilmington area and the Myrtle Beach metro area both fall well below the recommended density threshold to operate at break-even or better, requiring each transit system to rely heavily on grant subsidies; however, the Wilmington system operates in a much greater density environment as shown in Table 4.

Neighboring System 2. Emerald Coast Rider—Destin, Florida

Emerald Coast Rider (ECR) is the transit system in Okaloosa County, Florida. ECR's risk-management team aided this study with the statistics that follow. The population of the area it serves is 180,822. This transit system provides for Destin, Florida in Okaloosa County, which is a comparable area and market to Myrtle Beach, South Carolina, but smaller in population and geography. The

TABLE 3. Financial Comparison: WAVE Wilmington Versus Coast RTA

Category	Wave Wilmington, NC	Coast RTA
Service area population	216,479	380,000
Reported rides served	726,209	437,434
Ride fare	\$2	\$1.50
Operating revenue (2015)	\$2,563,080	\$570,750
Ride-projected revenue	\$1,452,418	\$656,151
Difference (Revenue – Ride-projected revenue)	\$1,110,662	(\$85,401)
Operating contract revenue	\$1,411,093	\$0.00

Source: WAVE FY 2015 Audit Statements and Coast RTA Board Packet, October 2016.

TABLE 4. Comparative Geography and Population Density

	Population (2015)	Geographical Area (Square Miles)	Population per Square Mile
Horry County, SC	309,199	1,133.9	272.69
City of Myrtle Beach, SC	31,035	23.3	1,331.97
New Hanover County, NC	220,358	191.5	1,150.69
City of Wilmington, NC	115,933	51.5	2,251.13

Emerald Coast region experiences seasonality similar to Myrtle Beach. However, the ECR transit system reacts to the seasonality in their operations by doubling their bus fleet in the peak season. In the off-season they run 11 buses on 11 routes, whereas in the peak season they run 22 buses on those 11 routes. At the time of this study, 50 drivers were employed to run the 22 buses on the 11 routes. In 2014, ECR had 182,584 annual riders. The fixed rate charge was \$1.50 per regular ride, excluding transfers or express routes. ECR earned \$195,084 in fare revenue during the 2014 calendar year. We do not have actual 2017 numbers; however, 2017 projected financials show total revenue of \$3.7 million and combined operating and capital costs of \$3.3 million for a budget surplus of \$400,000 projected. Revenue segments projected include \$2.1 million in federal grants, \$950,000 in state grants, \$93,500 in county grants, and \$500,000 in fare revenue.

Neighboring System 3. Charleston Area Regional Transportation Authority—Charleston, South Carolina

The Charleston Area Regional Transportation Authority (CARTA) is the bus transit system in Charleston, South Carolina, serving the entire metro area population of approximately 727,000 in 2015. The planning and operations manager provided the operational statistics. It operated 122 buses on 23 routes, with a fixed price of \$2.00. CARTA employed up to 300 drivers at a time, with an annual ridership of 4,876,087 people. The system does not adjust for seasonality; however, this is not a major constraint for the Charleston system. CARTA's 2016 projected revenue was \$31.5 million with a zero balance budget. Fare revenue was projected at \$2.7 million, \$8 million from a Charleston County sales tax, and federal grants of \$12.2 million. Other sources of revenue contributed the balance, including contracts with various enterprises, institutions, and municipalities.

System 4. Coast Regional Transit Authority—Horry and Georgetown Counties, South Carolina

Coast RTA operates throughout the Grand Strand region, with a service area population of 380,000 and annual ridership of 1,019,384 in 2015. However, consultant D. K. Shifflet and Associates projected 17 million annual visitors to the region by 2017. It operated 12 buses on 7 routes at a fixed price of \$1.50. It employed 50 drivers at the time of this study. Coast RTA does not account for seasonality. Projected revenue for 2016 was \$6.4 million, with \$3.1 million from federal grants, \$2 million from local grants, \$339,000 from state grants, and \$612,500 in projected fare revenue.

Upon analyzing the different transit systems, several efficiency-enhancing opportunities may be considered for Coast RTA. Assessment of the bus routes, the mileage and potential ridership density of those routes, and population and employment seasonality, combined with research on other systems suggests some recommendations.

The alterations it can make first are: eliminating free rides, having bus stops (not just wave stops), and lastly have enough buses operating the routes to be consistent in lag times between buses at each stop.

Our first recommendation concerns the impact of free rides. A study in California for the Bay Area Rapid Transit system showed free bus fares are a disincentive to market riders, those actually prepared to pay a market price for the bus service. Instead these free rides attract a disproportionate share of joyriders and members of the homeless population. Subsidized fares for such population groups would allow the system to continue serving these needs, while allowing for market fares and brand protection, stabilizing the revenue base (BARTS, 2009). One of the busiest tourism routes in the Coast RTA system, from the boardwalk to Broadway at the Beach, is currently a free shuttle ride, suggesting a great potential opportunity to shore up revenues and brand strength.

Our second recommendation concerns accessibility and service level. Currently, Coast RTA uses a high proportion of “wave stops” rather than easily recognizable stops. With the wave stop system, a person waiting for the bus must actually watch very attentively for a bus, and wave it down in order to stop the bus and catch a ride. As one might expect, human error plagues this type of system. For example, there is reasonable chance a driver, perhaps looking the other direction for just a few seconds, may drive right by the waiting rider, leaving them to wait for the next bus. Coast RTA should utilize complete, designated, signed bus stops to facilitate potential riders and build a reputation and relationship with locals and tourists.

Our third recommendation addresses the sharp seasonality of demand density. Some systems in our review do adjust for seasonality and some do not. The Grand Strand region may present the strongest case for incorporating seasonal route adjustments into a transit system’s business model. The difference between 17 million visitors concentrated disproportionately in the summer months relative to a resident population of only 370,000 people warrants serious consideration of the fixed and variable costs of implementing seasonal adjustments.

A fourth recommendation is additional innovative programs to provide specific service arrangements on a per client basis. Examples include airport shuttle programs or park-and-ride initiatives on an employer or employer group basis. Special programs to increase accessibility to state parks and related recreational and environmental amenities may help reach new markets and expand the brand. Aspects of this approach have worked well for the Charleston RTA with specific arrangements for the airport and for Boeing.

A final recommendation is the formal consideration of federal government subsidies and/or tax credits for alternative fuel adoption. Many transit authorities have leveraged their capital investments with the adoption of compressed natural gas (CNG) buses. These programs are constantly evolving, requiring a constant effort to stay up to date with the latest opportunities, and to maintain minimum standards for program qualification.

CONCLUSION

We have examined suburbanization and alternative forms of infrastructure development within the context of urban theory. Through actual case analyses, this study sheds light on important questions confronting the New Urbanism paradigm and its appeals to smarter development methods incorporating greater density, increased walkability, and a reduced impact on the environment. Applying urban theory, upholding sprawl as the result of a natural evolutionary process driven by consumer choice and increasing over time, we have investigated these issues from a sound economic perspective that policymakers can use with widely available, location-specific economic, demographic, and geographic information.

We have chosen two transportation-oriented problems and applied relevant concepts of urban economic theory in an effort to identify likely obstacles to successful program implementation. Our two specific case analyses involved a rapidly growing metropolitan area incorporated in the mid-twentieth century along the coast of South Carolina. Both studies highlight challenges facing a growing region. One has concerned the recreational infrastructure demands of a community's resident and tourist populations, while the other has examined the viability of a public transit system and its commitment to serve the seemingly divergent needs of tourists and residents.

Our first case presented a practical application of the relevant theory and empirical work on nature-based amenities and valuation for policy purposes. The novelty of this research concerns the gap between incorporated and unincorporated areas in growing regions of the southern United States. Zoning laws may address these development concerns in incorporated municipalities; however, as growth expands into unincorporated areas, disjointed neighborhood developments often overlook opportunities to cooperate with other developments to link infrastructure projects to drive down costs and improve accessibility. Our case has presented a pseudo-government solution to such a problem.

The second case considered the nearly ubiquitous challenge of providing cost-effective mass transit in all but the largest of metropolitan areas. Break-even densities for mass transit are almost nonexistent outside of the world's largest cities. The expansive, linear-oriented geography and low population density of smaller coastal regions are especially challenging factors. Rather than ignoring these economic aspects and consequently relying too much on government support, we have presented an economic rationale for incorporating market-driven solutions to simultaneously address workforce, community, and consumer preferences.

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