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ABSTRACTS

Wage Inequality Between Occupational Groups

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Abstract

This paper examines the dynamics of wage inequality between major occupational groups in the United States from 2005-2015. Specifically, the study seeks to determine the trend in wage inequality between 22 major occupational groups and each group's contribution toward that inequality. Theil's T Statistic is used to approximate the overall Theil Index and to calculate the Theil element for each occupational group. Payroll-based data from the Bureau of Labor Statistics Occupational Employment Statistics database is used rather than survey-based household data. The analysis found four occupational groups outperformed all others over the past decade - management, healthcare, computer, and business and finance. These groups had the largest positive contributions to the change in between-group wage inequality. Sales, personal care, food preparation, and education related occupations on the other hand were the most underperforming occupations.

Introduction

Inequality is not a new topic among researchers and the volume of academic research in the past 50 years underscores its importance. Much attention has focused on income inequality based on race, gender or educational level. However, wages are the primary component of income (Bakis and Polat, 2015) and as such have garnered wide interests from economists and sociologist recently (Autor and Katz 1999; Katz and Kearney 2006; Kim and Sakamoto 2008) as new statistical methods for measuring inequality have been introduced (Conceicao and Galbraith, 2000; Galbraith and Hale, 2007; Galbraith 2009).

The gap between high- and low-wage workers in the U.S. labor market has been widening since the 1970s. There are many explanations for this occurrence. One longstanding explanation centers on the return for measureable skills, also known as skill-based technical change (Bakis and Polat, 2015), which holds that formal educational level is the cause of wage inequality since employers pay a premium for better skilled workers. The educational wage gap accelerated in the 1980s with the introduction of computer technology in the workplace and increased reliance on knowledge workers (Perkins 1993). The reason for rising wage inequalities is beyond the scope of this research. Rather, this paper attempts to identify the trend in wage disparity between major occupational groups and to quantify each group's contribution to that disparity.

Literature

This study examines the structure of major occupational groups to determine trends in inequality and intergroup contributions to inequality.

Occupations are a basic component of societal stratification in industrial societies (Parkin, 1971). Grusky (2005) defines an occupation as a category of "functionally similar jobs" (p. 77). Furthermore, occupational structure refers to "the relative size and wages of different occupations" (Mouw and Kalleberg, 2010, p. 402). Grusky held that the occupational classification scheme is so entrenched in society that between-group disparities in wages are unquestionably regarded as "appropriate and legitimate" (p. 75). With such wide acceptance of the differences in occupational wages, researchers have focused on inequalities within occupational groups. This may partially explain the lack of research on between-group wage disparity. Another partial explanation has been the lack of statistical tools to measure inequality from aggregated data. As explained below, James Galbraith's work at the University of Texas has provided researchers a simple inequality estimation technique for aggregated data known as Theil's T Statistic.

James Galbraith, while working in conjunction with the University of Texas Inequality Project, developed a method of estimating inequality using Theil's T Statistic (Galbraith 1998, (Conceicao and Galbraith, 2000; Galbraith 2009). The technique is named after Henri Theil (1924-2000) who became interested in inequality and economic development in the early 1950s after witnessing the plights of poverty on a visit to India (Kloek, 2001). Using information theory from Claude Shannon's (1948) work, he derived a means for calculating inequality which could be decomposed into within- and between- group measures. While his methodology became widely accepted, it was difficult to apply because it required individual data and most published government data was aggregated. Galbraith modified Theil's technique to work with widely available aggregated government data (Galbraith 2009; Hale, 2016). Government databases use a variety of classification structures such as countries, states, industries, and occupations. The Gini coefficient and related Lorenz Curve, both popular inequality measures, use individual data and do not allow for the decomposability of inequality within- and between-groups (Galbraith 2009). Theil's method, however, does provide for such decomposability as long as the groups are mutually exclusive.

While Theil's index is the summation of within- and between-group inequalities, Galbraith and Hale (2007) found that in narrowly defined groups such as industries, the within-group inequality is not relevant because the between-group inequality serves as a fractal of total inequality and represents the lower limit of the Theil Index. The upper limit is unbound depending on the degree of within-group inequality. However, in previous industry-based wage studies where classifications were more homogeneous, within-group inequality was minimal and did not contribute significantly to the total inequality, making the between-group measure a strong estimate of the total inequality (Conceicao and Galbraith, 2000; Darity and Deshpande, 2000). However, in broadly defined classification schemes such as inequality studies on gender or race, within-group measures were more significant.

For this research within-group inequality is not examined because occupational groups are even more homogeneous than industrial groups which contain multiple occupations. The between-group measure, therefore, should give an excellent approximation and trend of inequality over the study period.

Theil's T statistic (T) is comprised of two components as shown in Equation 1, the between-group element (T'_g) and the within-group element (T^W_g) written as follows (Hale 2016).

[Eq. 1] $T = T'_g + T^W_g$

In Equation 2, Hale's formula is modified to accommodate occupational data. Here, i represents the occupational group, e_i is the number employed in occupational group i, E is total employment in the U.S., ln is the natural logarithm, y_i is the mean wage of occupational group i, and μ is the mean wage of the entire population.

[Eq. 2] $T'_g = \sum \{(e_i/E)*(y_i/\mu)*\ln(y_i/\mu)\}$

Thus, the Theil element for each occupational group, the part of the equation in braces, is that group's contribution to the Theil T statistic. Restating the portion of the equation in braces, the occupational group's Theil element is computed as (occupational group employment / total employment) * (occupational group's mean wage / mean wage of all occupations) * (natural logarithm of occupational group's mean wage / mean wage of all occupations). The sum of the Theil elements then produces the Theil T statistic, which is an approximation for the overall Theil Index.

A Theil T Statistic of zero does not necessarily mean between-group inequality does not exist. While perfect wage similarity between occupational groups will produce a Theil T Statistic of zero, so can equally unequal distributions. Since the Theil T Statistic is the sum of individual Theil elements, then if the positively contributing occupational groups equal those contributing negatively, then the Theil T Statistic is zero. Yet, under this scenario, wages between occupational groups are unequally distributed. Therefore, to provide meaning, the Theil T Statistic needs to be interpreted in context over a period of time and the Theil element of occupational groups in the context of their contribution to the Theil T Statistic.

Data

Unlike past studies, this research uses payroll data from businesses to determine the occupational group's structure in terms of employment size and wages. Data were obtained from the Bureau of Labor Statistics Occupational Employment Statistics database. Previous studies relied mostly on survey data of households such as the Current Population Survey (Kim and Sakamoto, 2008; Bakis and Polat, 2015). Household survey data is less reliable and have validity issues, especially international data (Conceicao and Galbraith, 2000).

Methodology

This study uses the Theil T Statistic in Equation 2 above to calculate between-group wage inequality for major occupational groups in the U.S. The Theil T Statistic is calculated for the years 2005-2015 to show the overall inequality trend. However, the Theil T Statistic is a summation of all the major occupational group Theil elements, and hence the latter must be calculated first. Both concepts are described in the literature review. Nevertheless, Figure 1 below is an example of the Theil element calculation for the management occupational group in 2015.

Table 1

Theil Element Calculation for the Management Occupation Group, 2015

Management Group Employment = 6,936,990
Total U.S. Employment = 137,896,660
Share of Total Employment
e_i / E = (6,936,990 / 137,896,660) = 0.0503
Management Group Mean Wage = $115,020
Mean Wage of U.S. Occupations = $48,320
Wage Ratio
y_i / μ = ($115,020 / $48,320) = 2.38
Theil Element = Emp. Share * Wage Ratio * Natural Log of Wage Ratio
= .0503 * 2.38 * 0.86726
= 0.1038

Results

The results are divided into two sections: the trend in occupational wage inequality between groups in the U.S. from 2005-15 using the Theil T Statistic as a measure and the contribution or performance of specific occupational groups during the period.

As shown in Figure 1, wage inequality between major occupational groups has risen every year since 2005, except in 2015 when it remained stable. During the study period, the Theil T Statistic rose from .089 to .105, an increase of .016 or 18 percent. Wage inequality rose faster during the economic downtown than the subsequent recovery. During the recession, the Theil T Statistic rose 0.005 or 0.0025 per year from May 2007 to May 2009. BLS Occupational Employment Statistic data is only captured in May of each year and the above two year period

approximates the last recession. However, during the recovery, from May 2009 to May 2015, the Theil T Statistic rose by 0.006 or only 0.0012 per year.

Table 2 shows the Theil element for each major occupational group in 2005 and 2015 as well as the change over the period. As seen in the table, only five occupational groups contributed positively toward the change in the Theil T Statistic over the past decade: management (0.013); healthcare practitioners (0.010); computer and mathematics (0.007); business and finance (0.006); and architecture and engineering (0.001). The change in Theil elements are noted in parentheses. Twelve occupational groups contributed negatively toward the change in the Theil T Statistic, meaning their Theil element decreased over the period. The largest decreases in Theil elements were education (-0.003), food preparation and services (-0.003), personal care and services (-0.003), and sales (-0.004). The Theil elements for each occupational group are shown in Appendices A and B by year and summed to calculate the Theil T Statistic.

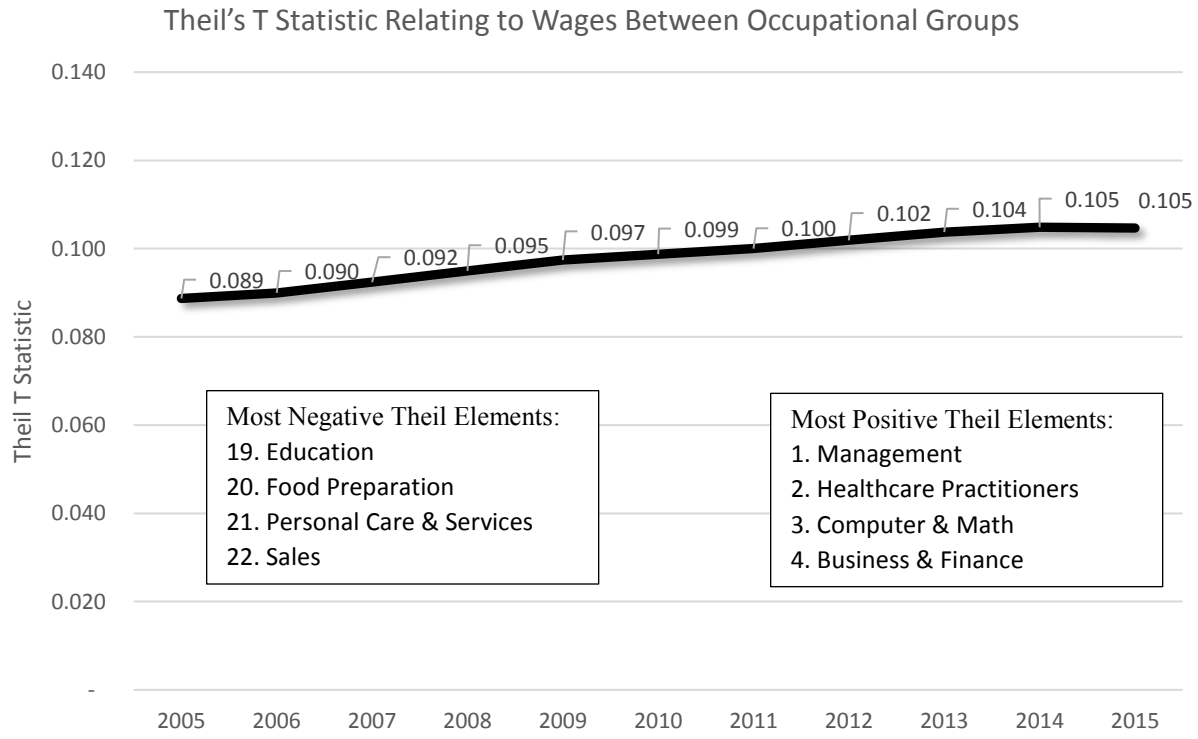

Figure 1. *Trend in between-group occupational inequality in U.S., 2005-15 as measured by Theil T statistic*

As mentioned earlier, if the positive Theil elements equal the negative elements, then the overall Theil T Statistic will equal zero giving the appearance of no inequality between the groups. The fact that the Theil T Statistic is positive, and trending up each year, means that some occupations like management, healthcare, computers, and business are increasingly

outperforming others. Occupational groups with negative Theil element values are considered underperforming and those with a decreasing element are getting even weaker.

Positive Theil elements increase the Theil T Statistic while negative elements decrease it. This means that occupations with positive Theil elements are outperforming their peers and those with a positive change over the last decade are doing so at an increasing rate. For example management occupations had the highest positive Theil element in 2015 and the highest positive contribution to the change in inequality. In other words, management occupations are outperforming all others in the relative size and wages.

Table 2.

Theil Elements of Occupational Groups, 2005-2015

Occupation	2005	2015	Change
Management	0.091	0.104	0.013
Business and Financial Operations	0.027	0.033	0.006
Computer and Mathematical	0.023	0.030	0.007
Architecture and Engineering	0.016	0.017	0.001
Life, Physical, and Social Science	0.006	0.005	(0.001)
Community and Social Service	(0.000)	(0.001)	(0.001)
Legal	0.012	0.013	0.000
Education, Training, and Library	0.010	0.006	(0.003)
Arts, Design, Enter., Sports, & Media	0.002	0.003	0.000
Healthcare Practitioners & Technical	0.035	0.045	0.010
Healthcare Support	(0.008)	(0.009)	(0.001)
Protective Service	(0.001)	(0.002)	(0.001)
Food Preparation and Serving	(0.029)	(0.032)	(0.003)
Building/Grounds Cleaning & Maint	(0.011)	(0.010)	0.000
Personal Care and Service	(0.008)	(0.011)	(0.003)
Sales and Related	(0.013)	(0.018)	(0.004)
Office and Administrative Support	(0.033)	(0.034)	(0.001)
Farming, Fishing, and Forestry	(0.001)	(0.001)	0.000
Construction and Extraction	0.001	(0.001)	(0.001)
Installation, Maint., and Repair	0.000	(0.002)	(0.002)
Production	(0.015)	(0.014)	0.000
Transportation and Material Moving	(0.015)	(0.016)	(0.001)
Theil T Statistic	0.089	0.105	0.016

The wage ratio quotient, as measured by the occupational group's mean wage to the national average, determines whether a group contributes positively or negatively to the Theil T

Statistic through its Theil elements. When the quotient is greater than 1.0, the group's average wage is higher than the national average and the natural logarithm of the quotient is positive. Quotients less than 1.0 produce negative logarithmic values and thus negative Theil elements. The greater the wage ratio quotient and the greater the share of an occupation's employment in the total workforce, the greater the occupation's Theil element and contribution to the Theil T Statistic. Thus a change in the Theil element over time indicates whether an occupational group is strengthening or weakening relative to others.

Discussion

The research found wage inequality between occupational groups rising in the U.S. over the past decade, regardless of economic conditions. This finding supports the idea that the workforce is becoming increasingly polarized, a trend extending beyond the scope of this study. Low wage occupations like personal care and food preparation pay half of the national average and have fallen further behind in the past decade. Making matters worse, these occupations now have an increasing share of total employment. Declining relative wages combined with an increasing share of the workforce is driving a greater wedge between these and high wage jobs in management, health care, computers, and business. Each of these outperforming occupations have increasing relative wages and an increasing share of employment. The result of this polarization is a hallowing out of middle income occupations, which serve as a stepping stone for low wage earners to become higher wage earners.

This research illustrates that using only aggregated employment and occupational wage data, Theil's T Statistic can be used to measure the dynamics of occupational wage inequality over time and to identify outperforming and underperforming occupational groups. This knowledge is particularly useful to sociologists and workforce developers, as well as job seekers and college students making career choices.

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Appendix A.

Theil Elements and the Calculated Theil T Statistic 2005-2010

Occupation	2005	2006	2007	2008	2009	2010
Management	0.091	0.089	0.091	0.093	0.096	0.097
Business and Financial Operations	0.027	0.029	0.029	0.030	0.029	0.031
Computer and Mathematical	0.023	0.023	0.024	0.024	0.025	0.025
Architecture and Engineering	0.016	0.016	0.016	0.017	0.016	0.016
Life, Physical, and Social Science	0.006	0.006	0.006	0.006	0.006	0.005
Community and Social Service	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Legal	0.012	0.012	0.013	0.013	0.013	0.013
Education, Training, and Library	0.010	0.010	0.010	0.010	0.010	0.010
Arts, Design, Entertain., Sports, Media	0.002	0.002	0.003	0.003	0.003	0.003
Healthcare Practitioners and Technical	0.035	0.037	0.038	0.040	0.042	0.044
Healthcare Support	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
Protective Service	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Food Preparation and Serving Related	(0.029)	(0.030)	(0.030)	(0.030)	(0.030)	(0.031)
Building, Grounds Cleaning, Maint.	(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.011)
Personal Care and Service	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
Sales and Related	(0.013)	(0.012)	(0.013)	(0.014)	(0.016)	(0.016)
Office and Administrative Support	(0.033)	(0.034)	(0.035)	(0.036)	(0.036)	(0.036)
Farming, Fishing, and Forestry	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Construction and Extraction	0.001	0.000	(0.000)	0.000	(0.000)	(0.000)
Installation, Maintenance, and Repair	0.000	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Production	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)	(0.013)
Transportation and Material Moving	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)	(0.015)
Theil T Statistic	0.089	0.090	0.092	0.095	0.097	0.099

Appendix B.

Theil Elements and the Calculated Theil T Statistic 2011-2015

Occupation	2011	2012	2013	2014	2015
Management	0.099	0.100	0.102	0.103	0.104
Business and Financial Operations	0.031	0.031	0.033	0.033	0.033
Computer and Mathematical	0.026	0.027	0.028	0.029	0.030
Architecture and Engineering	0.016	0.017	0.017	0.017	0.017
Life, Physical, and Social Science	0.005	0.005	0.005	0.005	0.005
Community and Social Service	(0.000)	(0.000)	(0.001)	(0.001)	-0.001
Legal	0.013	0.013	0.013	0.013	0.013
Education, Training, and Library	0.009	0.008	0.007	0.007	0.006
Arts, Design, Entertain., Sports, Media	0.003	0.003	0.003	0.003	0.003
Healthcare Practitioners and Technical	0.045	0.045	0.045	0.045	0.045
Healthcare Support	(0.009)	(0.009)	(0.009)	(0.009)	-0.009
Protective Service	(0.001)	(0.001)	(0.002)	(0.002)	-0.002
Food Preparation and Serving Related	(0.031)	(0.032)	(0.032)	(0.032)	-0.032
Building, Grounds Cleaning, Maint.	(0.011)	(0.011)	(0.011)	(0.011)	-0.010
Personal Care and Service	(0.009)	(0.010)	(0.010)	(0.010)	-0.011
Sales and Related	(0.016)	(0.016)	(0.017)	(0.017)	-0.018
Office and Administrative Support	(0.035)	(0.035)	(0.035)	(0.034)	-0.034
Farming, Fishing, and Forestry	(0.001)	(0.001)	(0.001)	(0.001)	-0.001
Construction and Extraction	(0.001)	(0.001)	(0.001)	(0.001)	-0.001
Installation, Maintenance, and Repair	(0.002)	(0.002)	(0.002)	(0.002)	-0.002
Production	(0.014)	(0.014)	(0.014)	(0.014)	-0.014
Transportation and Material Moving	(0.015)	(0.015)	(0.016)	(0.016)	-0.016
Theil T Statistic	0.100	0.102	0.104	0.105	0.105

Strategic approaches to increasing course management system adoption by higher education faculty

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Abstract

Although online course management systems (CMSs) have been available to higher education faculty for approximately 20 years, challenges still prevent universal adoption by faculty for teaching and learning. The scientific literature suggests that the reasons for persistent low levels of faculty adoption of CMSs are multi-causal. This paper will recommend a strategic approach to increase the adoption of CMSs among faculty members.

First, specific challenges to faculty adoption of CMSs will be described, and the role of willingness of faculty to complete training on CMSs as an influence toward CMS adoption will be discussed. Next, research showing that faculty perception of the level of compatibility of the CMS with their teaching style affects their CMS training completion, and likely has a secondary impact on level of CMS adoption, will be reviewed.

Faculty within different fields and with different tenure status, rank, and length of CMS use have been shown to have different predominant teaching styles, and therefore, their faculty perceive different levels of compatibility of their CMS with their teaching styles. Because higher levels of perceived compatibility increase willingness to complete training on the CMS, helping faculty with low compatibility teaching styles adopt new teaching styles may increase not only training completion but adoption.

Specific recommendations for targeting faculty with teaching styles that are less compatible with CMS use and improving the compatibility of their teaching styles with the CMS will be given.

Introduction

Although online course management systems (CMSs) such as Blackboard (Blackboard, Inc., 2016) have been available to higher education faculty for approximately 20 years (Empson, 2012), challenges still prevent universal adoption by faculty for teaching and learning (Straumsheim, Jaschick, & Lederman, 2015). This is a problem because faculty and higher education administrators agree that educational technology contributes to higher-quality teaching and learning as evidenced by a recent survey conducted by Straumsheim et al. (2015), in conjunction with Gallup. They surveyed a sample of 21,399 faculty and 885 technology administrators who worked in the public, private, and for-profit sectors, and found that the majority of faculty and technology administrators say that educational technology use results in improved student learning outcomes, and 84% of technology administrators and 63% of instructors believe that university spending on educational technology is warranted because of advances in student learning.

The scientific literature suggests that the reasons for persistent low levels of faculty adoption of educational technology (including CMSs) are multi-causal. These reasons include lack of training, knowledge, and practice (Dutta, Roy, & Seetharaman, 2013; Straumsheim et al., 2015); negative perceptions (Al-Senaidi, Lin, & Poirot, 2009; Ertmer & Ottenbreit-Leftwich, 2010; Onyia & Onyia, 2011; Pereira & Wahi, 2016a); time constraints (Al-Senaidi et al., 2009; Kenney & Newcombe, 2011; McKissic, 2012; Yidana, Sarfo, Edwards, Boison, & Wilson, 2013), poor infrastructure (Al-Senaidi et al., 2009; Aremu, Fakolujo, & Oluleye, 2013; Yidana et al., 2013), and incompatible teaching styles (Pereira & Wahi, 2016a).

This paper will recommend a strategic approach for targeting faculty with teaching styles that are less compatible with CMS use and improving the compatibility of their teaching styles with the CMS to increase CMS adoption rates. Increased CMS adoption rates will contribute to higher quality teaching and learning at higher education institutions, resulting in improved student learning outcomes.

Faculty CMS Adoption Issues

The literature indicates that CMS use by higher education faculty for teaching and learning increases the quality of teaching and learning (Simon, Jackson, & Maxwell, 2013; Tsai & Talley, 2013; Yidana et al., 2013). Additionally, in a survey of United States public, active, degree granting higher education institutions, Allen and Seaman (2016) found that 71.4% of academic leaders believe that online education learning outcomes are the same or superior to in-person instruction.

Nevertheless, many faculty are slow to adopt technology, including CMSs, or use it at low levels (Abrahams, 2010; Bothma & Cant, 2011; Straumsheim et al., 2015; Unwin et al., 2010). For example, while Straumshem (2015) found the majority of faculty (77%) "always" provide students with syllabus information via a CMS, far fewer faculty, "always" use it to provide e-textbooks and related material (33%), track student attendance (22%), identify students who may need extra help (16%), and integrate lecture capture (13%). Straumsheim et al. also revealed that faculty who have instructed an online class use CMSs at higher levels than faculty who have never taught an online class, especially in regards to communicating with students (59% those who instructed online, 37% those who have never instructed online) and recording grades (72% those who taught online, 47% those who have not taught online).

Also contributing to CMS adoption issues, Allen and Seaman (2016), who surveyed United States public higher education institutions for the past 12 years, found that over that time-period the amount of distance education courses and programs has increased. However, chief academic officers believe that faculty acceptance of online learning has not similarly increased. They reported that over this 12 year time-period, at most only one-third of chief academic officers perceived that faculty within their institutions "accepted the value and legitimacy of online education." (p. 6). Allen and Seaman also revealed that the percentage in the latest survey (29.1%) was less than the rate reported in 2004. Not surprisingly, chief academic officers at institutions with no distance education offerings have the most negative views of their faculties' acceptance of the value and legitimacy of online learning, only 11.6%.

Increase Faculty Training to Increase CMS Adoption

Studies suggest that faculty technology training on a CMS increases their adoption of the CMS. For instance, deNoyelles, Cobb, and Lowe (2012) revealed that faculty favored transitioning to an online training program using their institution's CMS, and the faculty perceived they were more adept at developing online courses at the end of the training. McBride and Thompson (2011) reported that faculty who completed a training workshop on Moodle, a CMS, were more willing to use Moodle after the workshop than before the workshop.

Porter (2011) asserted that new faculty should complete CMS training if they have class sizes greater than 100. He found that classes were more organized when faculty utilized a CMS's administrative functions. In addition, Hixon et al. (2012) analyzed the effect of faculty online training and decided that training participation influenced the development program impact.

However, many faculty are not willing to complete training on educational technology (Hassan, 2011; Hurtado, Eagan, Pryor, Whang, & Tran, 2012), including CMS training (Pereira, 2015). For example, Pereira (2015), who surveyed faculty at a public university in the northeastern United States, found that although CMS training was offered to faculty "on demand" in an online format and regularly (weekly) in an in-person format, the majority of faculty did not attend either type of training over the 12 month time-period prior to the survey. Faculty unwilling to complete CMS training will likely either not use the CMS or use it at low levels in the classroom, fostering missed opportunities to enhance teaching and learning and improve student learning outcomes.

Faculty Training and Adoption Resistance may Owe to Teaching Style Incompatibility

In a recent study of factors that influence faculty to complete technology training on their institution's CMS, Pereira and Wahi (2016a) asked faculty respondents to rate their perceptions of the relative advantage, compatibility, complexity, trialability, and observability of the CMS, which was Blackboard, and their willingness to complete CMS training. Controlling for other factors, only compatibility was significantly associated with willingness to complete training on the CMS, both online and in-person training modalities. These results suggest that faculty who are willing to train on the CMS already find the CMS compatible with their teaching style.

Similarly, the literature indicates that faculty are more likely to adopt an educational technology if they perceive it is compatible with their teaching style. For example, Tabata and Johnsrud (2008) found that faculty are more willing to teach distance education courses if they perceive it fits with their working styles. This is in agreement with other researchers who asserted that faculty who believe web-based education is consistent with their teaching values and techniques are more willing to integrate web-based methods (Ajjan & Hartshorne, 2008; Sayadian, Mukundan, & Baki, 2009).

Therefore, it may be possible that the reason faculty have not universally adopted the CMS is because it is not compatible with their teaching style. To elicit whether there are any associations between faculty demographic characteristics and perceived compatibility of the CMS with their teach style, Pereira and Wahi (2016b) surveyed 102 public university professors in the northeastern United States. They measured the following demographic characteristics: age (in age groups), gender (male, female, other), rank (instructor, assistant professor, associate

professor, and full professor (called "professor")), tenure status (full-time tenured, full-time tenure-track, full-time and part-time non-tenure-track), and department (Science, Technology, Engineering, and Math [STEM], Social Science, Economics, History, and Political Science [SEHP], Education, Communications, Game Design [ECG], and other departments including Business Administration, English Studies, Industrial Technology, Interdisciplinary Studies, and Nursing). They also measured how long faculty used the CMS and their self-reported level of expertise. Faculty perceptions of the CMS were measured using subscales developed by Keesee (2010) from the CMS Diffusion of Innovations Survey instrument.

Pereira and Wahi (2016b) found significant statistical correlations between faculty department, rank, and CMS length of use with faculty perceptions of compatibility of using the CMS with their teaching style. Faculty who taught in the department category "other" (included Business Administration, English Studies, Industrial Technology, Interdisciplinary Studies, and Nursing) expressed a lower-level of compatibility of the CMS with their teaching style than faculty in other department categories. Conversely, faculty who taught at the instructor or assistant professor ranks were more likely to believe the CMS is compatible with their teaching style than faculty in higher ranks (associate professor and professor). Finally, Pereira and Wahi's results suggest that the number of years faculty use the CMS positively influences their perception of its compatibility with their teaching style.

Importance of Identifying Faculty with Incompatible Teaching Styles

Given that the literature suggests that faculty whose teaching styles are not compatible with using technology are less likely to attend training on and adopt the technology, including CMSs, it is important for university administrators to identify faculty who have a teaching style that is incompatible with using technology for teaching and learning. To that end, studies suggest that faculty within certain fields feel less compatible using educational technology and teaching online. For example, Button, Harrington, and Belan (2014), who reviewed the literature related to information communication technology and online learning in nursing education, reported challenges related to using technology and logistical issues including having the time to create an online course. They also asserted that the literature suggests nursing faculty need training in educational technology use as well as how to facilitate online instruction. Additionally, as described in the prior section, Nursing Department educators were part of the group of faculty who expressed low compatibility with using their institution's CMS in a study conducted by Pereira and Wahi (2016b).

The literature also suggests that faculty within the field of Business Administration may have teaching styles not compatible with online training. These include a recent study conducted by Pereira and Wahi (2016b), detailed in the prior section, and an earlier study conducted by Roberts, Walker, and Kelley (2007) who explored the level to which Accounting faculty incorporate educational technology within their introductory accounting courses. Roberts et al.'s survey revealed that 90% of the Accounting faculty had never used a video web-based system and 70.5% had never collaborated with students using a web-based system. Faculty within other disciplines that may have teaching styles incompatible with technology, in particular with a CMS, are English Studies, Industrial Technology, Interdisciplinary Studies (Pereira & Wahi, 2016b).

Another group that may have teaching styles incompatible with technology use and the online learning environment are tenured faculty and those at higher ranks (e.g., associate and full professors). This is supported by research conducted by Pereira and Wahi (2016b) who found that faculty who taught at these ranks were less likely to perceive the CMS is compatible with their teaching styles than faculty in lower ranks ranks (instructor and assistant professor). In addition, the Higher Education Research Institute at the University of California, Los Angeles reported that professors and associate professors incorporate online homework and discussion boards less frequently than instructors and assistant professors (Eagan et al., 2014). Also, because instructors and assistant professors are generally younger than higher ranks, their post-secondary instructions may have been delivered via online resources. As a result, they may have earned some or all of their post-secondary degrees via online resources, leading them to higher perceptions of compatibility with these resources and their teaching styles.

Finally, research suggests there is a positive correlation between the number of years faculty have used a CMS and their belief that it fits with their teaching style (Pereira & Wahi, 2016b), and that educational technology self-efficacy impacts technology adoption by faculty (Al-Senaidi et al., 2009; Ertmer & Ottenbreit-Leftwich, 2010; Onyia & Onyia, 2011). Therefore, those who are new to teaching, have used the CMS on a limited basis, or do not have a background in online teaching may be another group whose teaching styles are incompatible with CMS use.

Help Faculty Adopt Teaching Style Compatible with Online Teaching

Helping faculty whose teaching styles are incompatible with using the CMS learn ways to incorporate the CMS into their current teaching styles and adopt new teaching styles compatible with online teaching may make them more willing to both train on and adopt the CMS. One way to accomplish this is to use faculty training and support to create a sense of connection between faculty members who teach in online programs. After interviewing online faculty and their adult students, Boiling, Hough, Krinsky, Saleem, and Stevens (2012) asserted that when faculty are encouraged to collaborate with other faculty, they can better understand new technologies, discuss ideas, and learn from each other.

Faculty who are not experienced with teaching online or using a CMS may find it difficult to develop interactive courses. In their survey, Boiling et al. (2012) found that most students taking online classes preferred interactive online courses that integrated multimedia, rather than online courses that primarily offered text-based content, little communication with others, and individualized instruction. Faculty who have taught only or primarily in-person may also find it difficult to "connect" with their students in an online course. Students feel disconnected with classmates and faculty in online courses if there is no or little interaction with others (Boiling et al., 2012).

The literature suggests that one way to help faculty foster connection and community with students and build more interactive online courses is to provide them with training on how to incorporate social media into their online instructional practices (Hung & Yuen, 2010; Junco, Heiberger, & Loken, 2011; Roebuck, Siha, & Bell, 2013; Wankel, 2009). For example, Roebuck, Siha, and Bell (2013) surveyed faculty who used social media for teaching and learning and found that, notwithstanding gender or rank, respondents agreed that the advantages of using social media include multiple sources for student comments, information sharing, improved

student engagement, stronger classroom community, and better-quality discussion opportunities and student collaboration. Junco, Heilberger, and Loken (2011) also revealed that the use of Twitter communication, a social networking and microblogging application, fostered student and faculty engagement in a first-year seminar course for pre-health majors; and, Wankel (2009) described how faculty can use different social media platforms, such as Facebook, blogs, YouTube, and Twitter, to facilitate strong collaboration among management education students.

Research also suggests that training faculty on the use of podcasting will help them obtain a personal connection with each student in an online environment, also necessary for good teaching. Forbes et al. (2012) conducted a qualitative case study of an online faculty education course and reported that podcasting improved emotional and interpersonal connections in an online class.

Faculty whose teaching styles are not compatible with using a CMS or teaching online may also need training on how to help students develop the skills they will need for their future careers. This is because faculty may not understand how to offer demonstrations and provide themselves as role models for skill-based learning outcomes in an online modality. Podcasting is one technique that has been found to work cultivate technical skills as well as the self-confidence students need for their educational careers (Forbes et al., 2012).

Faculty uncomfortable with online teaching may feel apprehensive if asked to move to this environment. Paul and Cochran (2013) suggested that one way to relieve this apprehension is to provide these faculty with instructional designers who have expertise in designing and teaching online courses. According to Paul and Cochran, trained instructional designers are vital to faculty because they can partner with faculty to discuss pedagogical issues and help them create portions of their course content, while letting faculty focus on their subject knowledge.

As well as instructional designers, faculty with teaching styles incompatible with using a CMS may benefit from technology training resources (Paul & Cochran, 2013). De Gagne and Walters (2009) synthesized online education qualitative literature and found that faculty who are more prepared technically devote more time to teaching their courses than focusing on the technical components of online learning.

Conclusion

A strategic approach to increase adoption of CMS in higher education faculty is to target those faculty whose teaching styles are less compatible with the CMS and provide them with supportive training to translate their teaching styles to the online setting. Once this is done, these faculty should be more willing to complete traditional training on the CMS, and will be more likely to adopt it for teaching and learning, resulting in improved student learning outcomes.

Faculty who have been shown to have teaching styles less compatible with CMS use and online learning, and, thus should be sought out for training, are those who teach in departments including Nursing, Business Administration, English Studies, Industrial Technology, and Interdisciplinary Studies. Other groups that may also have teaching styles incompatible with CMS use and online learning, and may require extra support, are faculty who are tenured, at higher ranks (associate and full professors), have never used a CMS or used it for a short time-period, and have reported perceptions of low technology self-efficacy.

The literature suggests that this training for faculty with teaching styles incompatible with CMS use or online learning should be in areas such as developing interactive courses, fostering community within the online classroom, incorporating social media and podcasting in instruction, developing students' skills, as well as helping faculty who teach in the online environment connect with each other. Researchers also suggest that formal training should be augmented with the use of instructional designers and technology training resources.

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The Importance of Empirical Research Design in Asset Pricing

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Abstract

The selection of methodological alternatives in asset pricing analysis can serve to significantly alter the interpretation and possibly the statistical inference of empirical results. We examine the statistical and economic impact of subtle yet important changes to the methodological design of an important empirical study. We select the pricing of idiosyncratic volatility as our test model, and we find that equally valid test designs can generate significantly different results and conclusions. We estimate monthly alphas for portfolios sorted by idiosyncratic volatility and find a set of plausible monthly alphas that range from -1.478% to +0.044%. We expound upon the challenges posed to researchers by the effects of methodological test design alternatives on inference.

Introduction

Researchers must choose among numerous design decisions in order to construct an empirical test. These decisions can significantly impact both empirical results and conclusions. This is particularly true of empirical asset pricing tests. For the particular methodology of portfolio formation, the most obvious design decisions are selecting the control variables and sample. In addition, researchers are required to make more subtle decisions, such as choosing between equal-weighted or value-weighted portfolios, determining the number of quantiles, choosing between CRSP and NYSE breakpoints, determining the frequency of portfolio rebalancing, and many others. Typically, the alternative choices are not controversial and commonly recur in the literature. For example, Fama and French (2008) form quintile portfolios and report equal-weighted portfolio returns in addition to value-weighted returns. On the other hand, Pasquariello (2014) forms decile portfolios and reports only value-weighted returns. Ang et al. (2006) form quintile portfolios and report only value-weighted returns. Fama and French (1993) rebalance their portfolios annually, while Jegadeesh and Titman (1993) rebalance monthly. These valid design decisions, however, can materially affect the economic and statistical significance of parameter estimates, and in turn alter the interpretation of the results. The purpose of this study is to examine and quantify the impact different design decisions can have on inference.

A seminal study by Ang et al. (2006) relating idiosyncratic volatility to portfolio returns uncovered an empirical puzzle that has spurred a large body of literature. Ang et al. (2006) report a large, statistically significant, negative relation between idiosyncratic risk and returns. We use the empirical evidence produced by subsequent studies of idiosyncratic volatility as guidance for our methodological approach to examine the impact of empirical asset pricing test design decisions on inference.

Because Ang et al. (2006) laid the foundation for idiosyncratic volatility literature, we take the design decisions of that study as the "benchmark" against which we measure the impact of various other design decisions. We then seek to identify the effect of empirical asset pricing test

design decisions on inference by quantifying the impact of various designs on the magnitude of estimated portfolio alphas.

Portfolio tests, as opposed to cross-sectional regressions, are commonly used in asset pricing studies because the point estimate of the portfolio alpha has economic significance in addition to statistical significance. A portfolio's alpha is the average return from an investment strategy, controlling for other known strategies and risk. Ang et al. (2006) report the alpha for a zero-investment strategy that shorts stocks with low idiosyncratic volatility and uses the proceeds to purchase stocks with high idiosyncratic volatility. Their strategy has a monthly portfolio alpha of -1.31% (Ang et al., 2006, p.285, Table VI). The purpose of our study is to examine how the monthly portfolio alpha changes as we change the test to include uncontroversial, yet subtly different designs.

The test designs we have chosen to analyze represent design decisions that have been examined previously in the idiosyncratic volatility literature and found to be warranted and relevant to inference. Because of their inclusion in the literature and the evidence that they are plausibly better design decisions, we consider them to be uncontroversial.

Our study is most similar to Chen et al. (2012), but has several important differences. Primarily, we focus on the identical sample as Ang et al. (2006) while Chen et al. (2012) use an updated sample. Further, our focus is quite different. They focus on identifying the situations when idiosyncratic volatility is priced. We focus more on the discussion of the issues that are more generally applicable to all of empirical asset pricing and statistical inference of portfolio alphas.

We consider the impact of the following design decisions: value weighting versus equal weighting, inclusion of the turn-of-year effect, the effect of low-priced stocks, choosing NYSE versus CRSP breakpoints, augmenting the three-factor model with the momentum factor, augmenting the three-factor model with the reversal factor, and replacing the three-factor model with the Fama and French (2015) five-factor model. From this set of uncontroversial design alternatives, we estimate a set of alphas that differ substantially from each other and from Ang et al. (2006). Finally, we analyze the impact the different design decisions have on the economic significance of idiosyncratic volatility as an investment strategy.

The Benchmark Design of Idiosyncratic Volatility Pricing

Ang et al. (2006) revitalize interest in the pricing of idiosyncratic volatility by documenting a surprising negative relation to portfolio returns. They use the Fama and French (1993) three-factor model and daily returns in excess of the risk-free rate to construct a monthly measure of idiosyncratic volatility, for each month and for each stock, in their sample period from July 1963 to December 2000. Idiosyncratic volatility is defined as the standard deviation of the residuals from these regressions. This measure is then used to form five value-weighted portfolios based on the rank of each stock's idiosyncratic volatility. All stocks in the sample are separated into portfolios based on idiosyncratic volatility breakpoints (the so-called "CRSP breakpoints"). The portfolios, sorted by their idiosyncratic volatility, are held for the following month and then rebalanced.

The price of idiosyncratic volatility is reached by estimating the alpha for a zero-investment portfolio that shorts the lowest idiosyncratic volatility portfolio and purchases the highest idiosyncratic volatility portfolio. The portfolio alpha is then estimated by again using the Fama and French (1993) three-factor model. We refer to this method of portfolio construction and

estimation of alpha as our benchmark method. In order to insure that our benchmark method follows the original work of Ang et al. (2006), we try to replicate their results. The comparison is presented in Table 1.

Our replication of the Ang et al. (2006) study produces nearly identical results. Our alphas follow a pattern similar to that reported in Table VI in Ang et al. (2006). Our estimated alphas are only slightly different from those presented by Ang et al. with differences ranging between 3 and 6 basis points. There may be many potential reasons for this minor discrepancy, but the most likely candidate is that of data revisions. CRSP continually edits and revises the data, and our data are from a 15-year later vintage. Therefore, although we use the same data period as Ang et al., the data published by CRSP in 2001 and 2015 may not be identical. Our noted discrepancies are quite minor, however, and we are confident that our revised test designs are consistent with Ang et al. (2006).

The t-statistics we report are somewhat different from those reported by Ang et al., but we use a different methodology to estimate standard errors. We use OLS standard errors, while Ang et al. use Newey-West (1987) standard errors. The purpose of our study is to examine the variation in the point estimates of the alphas rather than t-statistics in total, and thus we do not replicate their standard error measurement.

Alternative Designs for Pricing Idiosyncratic Volatility

Many studies subsequent to Ang et al. (2006) examine the puzzling relation presented in Table 1. In this section, we review some of these studies and describe how we use their findings to create alternative empirical test designs.

Portfolio Weighting

In their thorough investigation of the robustness of the negative relation between idiosyncratic volatility and alpha, Bali and Cakici (2008) identify two key methodological issues that affect inference. The first issue is the weighting scheme of the portfolios. The standard in empirical asset pricing research is to report value-weighted portfolio results at the very least, and many researchers eschew reporting equal-weighted portfolio results. Ang et al. (2006) examine only value-weighted portfolios. Bali and Cakici (2008), however, find that the magnitude of the alpha is mitigated by the selection of equal-weighted portfolios.

The choice of reporting alphas for equal-weighted portfolios in addition to value-weighted portfolios is an important one, and the effects of this choice on the interpretation of the results of asset-pricing tests need to be examined. The return on an equal-weighted portfolio better describes the return of a typical stock in the portfolio. Portfolio returns, however, may be overly influenced by small, illiquid stocks. Value weighting better captures the experience of a typical investor in the stocks of the portfolio, but value-weighted portfolios may not be well diversified (e.g., Malevergne et al., 2009). Fama and French (2008) advocate the use equal-weighted portfolios in addition to value-weighted portfolios. We report both value-weighted and equal-weighted portfolio results for all of our test designs.

Portfolio Breakpoints

In order to form a set of portfolios based on some variable, such as idiosyncratic volatility, researchers must choose some value, or breakpoint, to use to break up the sample of stocks in order to assign them to portfolios. Two common methods have developed to form portfolio quantiles.

The first, called CRSP breakpoints, is to compute quantile breakpoints using all stocks available on CRSP. These so-called "CRSP breakpoints" have the advantage of maximizing dispersion of the variable used to form the portfolios. The second method, used by Fama and French (1992), is to set breakpoints for quantiles of stocks trading on the NYSE. These so-called "NYSE breakpoints" ensure that large, liquid stocks appear in all of the portfolios.

The second key issue identified by Bali and Cakici (2008) is that the conclusions of Ang, et al. (2006) depend on the choice of breakpoints. Ang, et al. (2006) only use CRSP breakpoints thorough their study. When replacing the CRSP breakpoints with NYSE breakpoints, Bali and Cakici (2008) find that the negative relation is no longer significant. This is important because both methods of setting breakpoints are commonly used and it is not clear which method is preferable.

The Cahart Momentum Factor

Arena et al. (2008) show that idiosyncratic volatility is linked to returns from the momentum strategy of buying short-term (up to one year) winners and selling short-term losers. They argue that idiosyncratic volatility limits arbitrageurs from correcting these prices and find that momentum profits are highest among high idiosyncratic volatility portfolios. To incorporate this finding in our analysis of idiosyncratic volatility, i.e., to see if the negative relation is a product of the known momentum anomaly, we augment the three-factor model with the Carhart (1997) momentum factor.

The Huang et al. Reversal Factor

Huang, Liu, Rhee, and Zhang (2010) further the analysis of the negative relation between idiosyncratic volatility and portfolio returns by incorporating the effect of serial correlation in returns. These authors argue that by ignoring serial correlation and using only value-weighted portfolios, Ang et al. (2006) may have induced downward bias in their estimation of the relation between returns and the previous month's idiosyncratic volatility. Huang et al. (2010) control for the effect of short-term return reversal by adding a reversal factor to the three-factor model. We follow Huang et al.'s (2010) lead by including their reversal factor in our estimation of the portfolio alphas. The Huang et al. reversal factor represents a valid choice for addition to an asset-pricing test, and thus may influence economic inference.

Fama and French's Five-Factor Model

Lehmann (1990) argues that the variance of the residuals from a mis-specified factor model should be related to average returns. Given that the Fama and French (1993) three-factor model has been unable to explain certain phenomena (e.g, momentum), it may be a mis-specified factor model. To address this possibility we estimate portfolio alphas using the Fama and French (2015) five-factor model. This is the three-factor model augmented with two new factors: an investment factor and an earnings factor.

The investment factor is represented by a portfolio that is short stocks with the lowest total asset growth over the previous year, and long stocks with the highest total asset growth. The earnings factor is represented by a portfolio that is short stocks with the lowest operating profits, and long stocks with the highest operating profits. These two factors are designed to capture two anomalies – asset growth and profitability – and may lead to a more correctly specified factor model.

The Turn-of-Year Factor

Peterson and Smedema (2011) find that there is a significant turn-of-year effect in the relation between expected returns and the Ang et al. (2006) measure of idiosyncratic volatility. By augmenting the Fama and French (1993) three-factor model with the Carhart (1997) momentum factor and a January indicator, the fragile results previously found by Bali and Cakici (2008) and Huang et al. (2010) become more significant and robust. Therefore, because the January indicator represents a valid methodological choice for risk-adjusting returns, we include the indicator in our estimation of the portfolio alphas.

Low-Priced Stocks

Bali and Cakici (2008) find that eliminating stocks with prices of less than $10 reduces the magnitude of the alpha of the idiosyncratic volatility designated zero-investment portfolios. To the contrary, Chen et al. (2012) find that the elimination of stocks with prices less than $5 actually increases the magnitude of the portfolio alpha. Proceeding with or without low-priced stocks are equally valid alternative methodologies. On the one hand, we should not unnecessarily eliminate data. On the other hand, the use of low-priced stocks may negatively impact inference because of potential liquidity issues. Further, determining what price is the cutoff for low priced stocks is quite subjective. Given the conflicting inferences from Bali and Cakici (2008) and Chen et al. (2012), and the difficulty in determining the correct price cutoff, we report the pricing of idiosyncratic volatility excluding both stocks with prices less than $5 and less than $10.

Data and Sample

The data come from CRSP and Kenneth French's data library. From CRSP we obtain all data for returns, prices, shares outstanding, SIC codes, and exchange codes. From Kenneth French's data library we obtain the risk-free rate, the market return factor, the size factor, the value factor, the momentum factor, and the short-term reversal factor. We apply standard filters and remove all stocks from the firms in the financial industry (SIC 6000 to 6999) and utilities (SIC 4900 to 4999). We also filter out all stocks that do not trade on the NYSE, American Stock Exchange, or NASDAQ. We filter out all observations that do not have data on returns, the end of month price, or sufficient daily returns to calculate idiosyncratic volatility from the previous month. Finally, we require stocks to have book value of equity available from COMPUSTAT. We use the Fama and French (1992) method for computing book value of equity. With these filters and data requirements, our full sample is 1,731,820 stock-month observations spanning from August 1962 to December 2000. We choose this end point to direct all comparisons to the original results in Ang et al. (2006) without fear of a change in market conditions (e.g., Han and Lesmond, 2011) as the cause of our different results.

The Effects of Alternative Empirical Designs

The effect of alternative empirical designs on value-weighted portfolios

In this section, we analyze the impact of our alternative empirical choices on estimated portfolio alphas for value-weighted portfolios, weighted by the stock's market capitalization at the end of the previous month. In Table 2, we report again the Fama-French (1993) three-factor alphas in the row labeled "Benchmark". We provide alphas for alternative empirical designs in the subsequent rows, labeled accordingly in the "Methodology" column. All portfolios are

constructed with CRSP breakpoints, with the exception of the fifth row of alphas, which are constructed with NYSE breakpoints.

Table 2 shows that our different empirical design decisions lead to a large dispersion of results. While all of the estimated alphas from the *H-L* portfolio are negative and statistically significant for each research design, economic significance varies greatly. When we add the January indicator to the three-factor benchmark model, the alpha increases in magnitude by about 0.1% per month, which corresponds to a compound annual difference of -1.2%. The addition of the Momentum and Reversal Factors to our benchmark factor model has a negligible impact on the magnitude of the benchmark alpha. The other five changes to the methodology substantially increase the magnitude of the alphas. For example, using NYSE breakpoints increases the benchmark *H-L* alpha from -1.372% to -0.667%. On an annualized basis, this represents a substantial, economically significant shift from -15.28% (benchmark with CRSP breakpoints) to -7.72% (NYSE breakpoints) for the *H-L* portfolio. The smallest alpha occurs when we add all of the alternative design choices. From this model, the monthly alphas are -0.259% (or about -3% per year), which is over 1% per month different than the largest alpha from the January indicator model.

The annualized alphas range from -16.36% to -3.06% demonstrating an interesting aspect of Leamer (1983) and Leamer and Leonard's (1983) concept of fragility. Their concept of fragility results from methodological changes generating a range of regression of estimates. "When the range of inferences is too wide…, then we must conclude that inferences…are too fragile to be useful" (Leamer and Leonard, 1983, p.306). The range of alphas in Table 2 is enormous, but there is no range in inferences as they are all significantly negative. As such, by the strict definition of robust (the opposite of fragile) from Leamer and Leonard (1983), these alphas are robust.

The effect of alternative empirical designs on equal-weighted portfolios

Table 3 presents the same regressions shown in Table 2, but for equal-weighted portfolios rather than value-weighted portfolios. Equal-weighted portfolios are more diversified than value-weighted portfolios, and they are immune to some biases that affect value-weighted portfolios (see Huang et al. 2010). Alphas from equal-weighted, zero-investment portfolios represent risk-adjusted returns of the average high volatility stock in excess of the risk-adjusted returns of the average low volatility stock. Whether to report equal-weighted portfolio alphas in addition to value-weighted portfolio alphas is an important decision that test designers should consider.

In Table 3, we report the benchmark results for equal-weighted portfolios in the first row. For the remaining rows, we present the alternative methodological choices using equal-weighted portfolios. Consistent with Bali and Cakici (2008), we find that equally weighting the portfolios causes estimated alphas to rise toward zero. The benchmark method using equal-weighted portfolios has an alpha of -0.358%. This alpha is economically significant, corresponding to a compound annual return of -4.21%, but much lower in magnitude than the -15.28% compound annual return from the value-weighted portfolio. Again, the dramatic increase in the magnitude of the alpha implies that the results may be fragile. However, since the alpha is still statistically significant at the 10% level, we should conclude, according to Leamer and Leonard (1983), that the results are robust.

For every empirical design, alphas for equal-weighted portfolios are higher than for their value-weighted counterparts. Again, the January indicator design produced the lowest *H-L* portfolio alpha, but it is about 0.6% greater than the analogous value-weighted portfolio alpha.

Two of the designs – adding the momentum factor and using the Fama and French five-factor model – produces portfolio alphas not significantly different from zero. The five-factor model even produces a positive *H-L* portfolio alpha.

With the equal-weighted portfolios, the pricing of idiosyncratic volatility potentially fails to prove robustness. The range of the estimates of the alphas is 0.91% per month (11.5% annualized), which is, again, enormous. Further, with the equal-weighted portfolios, our methodological changes yield a range of inferences. The alpha estimates from a four-factor model with momentum and the five-factor model yield insignificant alphas. We now have a range of possible inferences (i.e., the strategy either earns a negative profit or no profit at all) in addition to a wide range of alpha estimates.

Discussion and Summary

We use the idiosyncratic volatility analysis of Ang et al. (2006) and the empirical results of subsequent studies as the framework of our analysis to determine how using different methodological test designs impact inference. Our results indicate that a strategy of shorting low idiosyncratic volatility stocks and purchasing high idiosyncratic volatility stocks produces a very economically significant dispersion, ranging from a risk-adjusted annual loss of -15.28% to a risk-adjusted annual profit of 0.53%. These are two very qualitatively and quantitatively different amounts. The wide range of portfolio alphas that result from making subtle choices between empirical test designs raises questions about the fragility of the interpretation of asset pricing test results. If the nature of the relation between idiosyncratic volatility and returns changes following simple changes in methods (e.g., using the equal-weighted rather than value-weighted portfolios), how can empirical asset pricing researchers appropriately draw inference about the true profitability from a particular investing strategy?

The cynical view of empirical research is that a researcher can estimate dozens of models and selectively report the results that tell the best story. Our results highlight the opportunity of this cynical view. In addition to the fear that a researcher will "cherry pick" the method that leads to the preferred conclusion, and given the rise of computing power and data availability, a researcher could find several models and methods that could give an additional appearance of robustness. Not only can researchers estimate dozens of models, they can also report the results of dozens, or even millions of models (Sala-I-Martin, 1997). While journals cannot feasibly publish in print all of the extra results, they could report them as an internet appendix. Alternatively, most researchers have their own personal pages on their university website on which they report their curriculum vitae, drafts of working papers, and computer code from research studies. Instead of reporting results selectively, we could strive to report results comprehensively.

Several researchers have contemplated how to combat any charge of "cherry picking" results in empirical research. Leamer (1983, 1985, and 2010) advocates a sensitivity analysis in which researchers estimate the extreme maximum and minimum values for regression coefficients. Sala-I-Martin (1997) argues that Leamer's (1983) method is unnecessarily strict and prefers to estimate every possible combination of a set of control variables and the probability distributions of the set of regression coefficients. The concerns of those sympathetic with Leamer's views stem from the rise of computing power and data availability.

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Table 1
Benchmark Alphas (%) for Idiosyncratic Volatility-Sorted Portfolios

	L	ML	M	MH	H	H-L
Replication	0.101**	0.116*	0.063	-0.278***	-1.271***	-1.372***
	(2.524)	(1.840)	(0.790)	(-2.664)	(-8.546)	(-8.205)
Ang et al.	0.04	0.09	0.08	-0.32**	-1.27***	-1.31***
	(0.99)	(1.51)	(1.04)	(-3.15)	(-7.68)	(-7.00)

In this table, we report the portfolio alphas (×100) from our replication and the corresponding alphas from Ang et al. (2006) for idiosyncratic volatility-sorted portfolios. Idiosyncratic volatility is measured at monthly intervals from daily data. For each month in our sample period, we estimate the Fama and French (1993) three-factor model with daily excess returns (returns less the daily return on a portfolio of U.S. T-bills) and the daily factors from the previous calendar month. We measure monthly idiosyncratic volatility as the standard deviation of the residual from the daily three-factor regressions ($\times\sqrt{30}$). We exclude all estimates that are made with fewer than 15 daily observations. When forming these portfolios, we follow Ang et al. (2006). We form quintile portfolios every month based on CRSP breakpoints. We form a long-short portfolio (H-L) by shorting the lowest quintile portfolio (L) and purchasing the highest quintile (H). We value-weight the portfolios based on each stock's market capitalization (*price* × *shares outstanding*). We estimate the portfolio alphas by regressing the six time-series of portfolio returns on the Fama and French (1993) three factors. All return data is obtained from the CRSP daily and monthly files. The factors and the T-bill returns are obtained from Kenneth French's data library. In the rows labeled 'Replication,' our sample period is identical to Ang et al. (2006), beginning July 1963 and ending December 2000. The values in the row labeled 'Ang et al.' originate from Table VI in Ang et al. (2006). We report the alphas in the first row and the OLS t-statistics in parentheses in the second row. *, **, *** denotes statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 2
Alphas (%) for Value-Weighted, Idiosyncratic Volatility-Sorted Portfolios

Methodology	L	ML	M	MH	H	H-L
Benchmark	0.101**	0.116*	0.063	-0.278***	-1.271***	-1.372***
(value-weighted)	(2.524)	(1.840)	(0.790)	(-2.664)	(-8.546)	(-8.205)
Turn-of-Year	0.089**	0.103	0.052	-0.287***	-1.389***	-1.478***
Factor	(2.181)	(1.582)	(0.628)	(-2.675)	(-9.187)	(-8.660)
Exclude	0.112***	0.101*	0.098	-0.189**	-0.673***	-0.785***
< $5	(2.625)	(1.654)	(1.332)	(-2.064)	(-5.386)	(-5.477)
Exclude	0.111**	0.078	0.178**	-0.007	-0.450***	-0.561***
< $10	(2.250)	(1.404)	(2.479)	(-0.085)	(-3.729)	(-3.914)
NYSE Break-	0.136***	0.147**	0.109	0.085	-0.530***	-0.667***
points	(2.694)	(2.483)	(1.508)	(1.026)	(-5.625)	(-5.515)
Momentum	0.131***	0.187***	0.084	-0.236**	-1.208***	-1.339***
Factor	(3.149)	(2.871)	(1.003)	(-2.165)	(-7.768)	(-7.646)
Reversal	0.115***	0.086	0.061	-0.287***	-1.300***	-1.416***
Factor	(2.885)	(1.358)	(0.755)	(-2.723)	(-8.670)	(-8.413)
Fama-French	0.027	0.078	0.154*	-0.103	-0.958***	-0.985***
Five Factor	(0.706)	(1.228)	(1.917)	(-1.022)	(-6.825)	(-6.382)
All	0.075	0.047	0.061	0.035	-0.184*	-0.259**
	(1.367)	(0.709)	(0.740)	(0.375)	(-1.793)	(-2.026)

In this table, we report the portfolio alphas (×100) from our benchmark methodology and several alternative choices for value-weighted idiosyncratic volatility-sorted portfolios. See Table 1 for discussion of our estimate of idiosyncratic volatility, our method for estimating alpha, and the methodological choices used to form our benchmark estimates. In the first column, we describe the methodological alternative choice for the corresponding set of alphas. In the 'Benchmark' row, we reproduce the alphas from Table 1. In the 'January Indicator' row, we report the alphas from Fama and French (1993) three-factor regressions augmented with a January indicator variable that takes the value of one if the observed return is from the month of January and zero otherwise. In the 'Exclude < $5' and 'Exclude < $10' rows, when forming our portfolios, we exclude all stocks with prices less than $5 and $10, respectively, at the end of the previous month. In the 'NYSE Breakpoints' row, instead of using all stocks in setting the portfolio breakpoints, we set the breakpoints between portfolios only using stocks that trade on the NYSE. In the 'Momentum Factor' row, we augment the Fama and French (1993) three-factor model with the Carhart (1997) momentum factor to estimate the portfolio alphas. In the 'Reversal Factor' row, we augment the Fama and French (1993) three-factor model with the short-term reversal factor to estimate portfolio alphas.

In the 'FF 5 Factor' row, we use the Fama and French (2015) five-factor model. In the 'All' row, we use all of these alternative methodological choices in constructing our portfolios and estimating our portfolio alphas. The price data are from CRSP, and the momentum and reversal factors are from Kenneth French's data library. We report the alphas in the first row and the OLS t-statistics in parentheses in the second row. *, **, *** denotes statistical significance at the 10%, 5% and 1% levels, respectively.

Marketing Ethics: Cases on the Image of Beauty from Corporate Social Responsibility Perspectives

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Abstract

While aspects of globalization are certainly favorable, in a world of such diverse proportions, a global population striving for a singular dominate image contributes to both a source of contemporary cultural loss and a deterioration of esteem, particularly in non-white nations. First, this paper examines the image of beauty from western culture perspective, then compares with various non-west cultures including China and Africa. Then, investigation continues on the dispersion of western media and marketing. Lastly, questions on Corporate Social Responsibility from marketing perspectives are suggested.

Introduction

Studies pertaining to Marketing and Consumer Behavior revolve mostly around Western practices, either directly or derived from Western principles, even amongst global academia (Jafari 193). Between the combination of widespread circulation of both Western dominated Marketing philosophies and its product in the form of Western media, it's hardly surprising that beauty standards have taken a shift toward a more universal ideal as a part of globalization. While aspects of globalization are certainly favorable, in a world of such diverse proportions, a global population striving for a singular dominate image contributes to both a source of contemporary cultural loss and a deterioration of esteem, particularly in non-white nations. The purpose of this paper is to examine this image, its international effects given widespread examples, and the ethics of marketing within such a spectrum.

Western Concept of Beauty

The most prominent consumer industries influencing body image include cosmetics, body modification, and fashion. Geographically speaking, almost half of the global market share in make-up is dominated by three companies based in the U.S. and one from Europe ("Global Make-Up Industry Profile" 12), with most major beauty companies pinpointed in either New York or Paris, the U.S. or France (Jones 2). Similarly, the fashion industry is notably centered in Paris, London, New York, and Milan (Wenting and Frenken 1031), with three quarters in Europe and the final city in the U.S.. It comes as no surprise that the ideal image of Western Europe includes features common to a typical white individual, including pale skin, a thin frame, and large eyes, as this properly represents the demographic in most West European nations.

The United States possesses a much greater diversity and has been repeatedly criticized for its lack of positive media representation with slow progress to show for it. Protagonists depicting people of color is lacking in most popular entertainment, including film and television (Bond 241) and video games (Dickerman 20), and marketing follows suit. An idealized body type is considerably pushed along with a dominating demographic. This includes a tall, exceptionally thin figure for women and a thin waist, broad

shoulders, and a particularly muscular figure for men. It's a figure that's almost impossible to achieve naturally. Options to attain such a body either require an immense amount of devoted free time, pristine nutrition, and self-discipline, the kind of time and attention, mostly only a job in the field could provide, or an unhealthy regimen. People within the represented demographic struggle psychologically under the pressure of meeting this standard, so on the off chance a minority demographic in the U.S. is adequately represented, chances are the model falls into this other difficult to achieve category.

Another source of popular entertainment that merits some discussion is the market for video games. While representation in video games has definitely grown, both women and people of color are often still depicted in stereotypical ways (Brown and Pardun 7). Dickerman notes, main characters who are black are overwhelmingly represented in shooters and sports games, with main characters in genres like historical or fantasy greatly overlooked. He goes on to note stereotypes followed across most genres, with women depicted sexually or in supportive roles, East Asian characters placed in roles relating to martial arts, and foreigners, in general, cast as the enemy, opposing heroic, white main characters (25). The demographic for the video game fan base often includes impressionable young people who are still developing their global perspective. When we consistently represent a demographic poorly, people develop a skewed image for their expectations of that demographic, including a negative self-perception for those involved.

Thus, the threat of a cookie cutter image is not necessarily inherent in the product as long as the image is healthy and the audience is appropriate. The threat lies in the overwhelmingly dominant Western media outlets and its widespread use in global programming and advertisements. Presently, the image is neither healthy nor necessarily adapted for regional variances. For any other product, Marketing studies constantly and persistently dictate adjustments based on local culture, yet regarding beauty standards, this principle is consistently ignored.

Traditional Beauty Ideals in Various Non-West Cultures

Globalization is defined as “the process by which human societies have grown increasingly interdependent, transcending geographic, economic, political, and cultural barriers” (“Globalization”). Due to the disproportionate distribution of major players, and consequently funds, within media and beauty marketing, we experience a shift in global standards of beauty. In order to argue that dominant Western forces within the field continue to assert international pressure and will continue with an adverse effect to international societies, we must first ascertain the scope of change that has already occurred. To nations without a Western mindset, what was the epitome of beauty?

In ancient China, for example, foot binding was a common practice for noble women as a symbol of control and feminine sexuality (Wang), and small, broken feet were looked to as the ideal. This sense of fragility seems to be an attractive concept to the Chinese people historically, and it was reflected in beauty standards. While standards trend toward increasingly taller and thinner ideals since the 1970’s (Leung et al. 342), documentation shows the Chinese valued thinner figures through most of the past, and records show women in the harems would starve themselves to achieve a tiny frame during the Chun Chiu period (Witcomb et al. 333), but the laborers and lower class possessed more practical, lenient standards (Leung et al. 346). That being said, there were historical periods where the Chinese preferred larger figures, such as the Tang Dynasty, and “one of the four great beauties reported in ancient Chinese history was overweight (Witcomb et al. 333).” Exemplified here, the history of some non-West cultures demonstrate the same strictness toward beauty performed in the West. As modern day Western ideals seep into such cultures, they

seem to simply preoccupy minds with new direction, a modified ideal to strive toward. The danger here is not necessarily a completely new threat, but it is rather a threat to culture loss as the young adopt a second mode of pressure to be thin along with new culture norms. While every nation cannot be discussed, there is definitely a spectrum in which nations can fall, influenced to varying degrees by the original home culture and degree of exposure.

As we move to discuss a few nations in Africa, the most noticeable beauty-related shift in culture revolves around black hair. The topic of black hair is still a hot button issue today, and it stems from a long history. Hair has such a deep cultural significance across various nations in Africa. Such hairstyles were traditional, spiritual even, and the styles often took great detail and care. When slavery began, African slaves found it more practical to abandon their intricate hairstyles, cutting it short and covering it from the heat. As wealthy slave owners donned wigs, the comparison between black and white hair marks the beginning of a stigma for black hair and established a social hierarchy for hair, one that deemed natural black hair unprofessional (Thompson 833), setting a precedent for an opinion that withstands to this day. Thompson notes black women in the U.S. have been punished for wearing their hair naturally in a corporate setting, giving examples of a woman sporting an afro for her airline and another managing hers with braids working in a prison (836).

Body size and the thin ideal will be further discussed in full, but it's important to note that most African, African derived populations, Latina, and often island countries including the Caribbean and Oceana, contain beauty ideals that traditionally praise a curvier, heavier shape than the thin ideal of Western culture (Franko 244), both currently and historically.

Discussion and Marketing Ethics

People of color must often live up to certain standards in order to be incorporated into general media and advertisements, and it says a few things. It says they are incorporated for the sole purpose of diversity—in order to either satisfy a requirement, or more likely to not completely alienate potential audiences, to seem likeable and relatable. Yet the respective characters don't seem to resonate with the corresponding audience. The characters depict something different from the culture of a good majority of said population. We must then question whom exactly this inclusion is for, because this says there is a socially acceptable way to be a person of color, and conversely, a stereotypical, unacceptable way.

Next, it says Caucasian individuals are standard. White people come across as the default, and they are defined in advertisements and media through their character traits or surrounding cues with several traits and physical variations represented in a sitting. For instance, a white individual with tattoos and piercings will come across edgy. If you translate this to a black person, there's a new "ghetto" connotation, rather than an edgy, alternative description. If you translate it to a Latino, we get thug, drug dealer, prostitute, etc. based on stereotypes and the exotic connotation of Latina women. In this way, race plays as an adjective of sorts, whereas a fair complexion offers a blank slate.

Through all of this, I argue that as Marketers, we do have a social responsibility. I believe the best solution for all parties involved includes more neutral media and advertisement inclusion. To clarify, a neutral stance includes more representation in general to offer more visibility for people of color. Proper visibility is important for marginalized groups because in the same way young men repeatedly exposed to sexist video games tend to view women in a more subordinate, sexist view (Stermer 52) and the same way

repeated exposure to negative portrayals of mental disability in film encourages fear and uncertainty toward mental illness (Whitley and Barry 246), this principle applies to repetition as demonstrated in the beauty industries. However, I believe the ethical way can be profitable. From a business standpoint, advertisement inclusivity is beneficial long term in order to express inclusion on the part of your brand. We study so many nonverbal cues in Marketing, emphasizing the significance that repetition can achieve, planting signals consumers aren't even necessarily aware they're receiving. When practiced with consistently with prior research into the communities, the repetition will send a message that the brand is for a certain target, people with a certain lifestyle that isn't limited by race. For international companies, inclusive advertising can better reinforce regional Marketing when their advertisements receive global publicity. It helps improve branding and public relations across all fronts.

A neutral stance also includes less stereotyped representation to emphasize the potential and diversity in the same way that their white counterparts have been portrayed. Practically, this includes questioning product development with these specific issues in mind and correcting them before release. This contributes to a shift in a beneficial direction, a shift toward the masses subconsciously registering all races with the same blank slate that they register white passing individuals as they communicate in their everyday lives.

The fear of gradual culture loss is another concern. This is a major drawback amidst the benefits of globalization. Image and dress are an easily accessible portion of the culture, and promoting one image through popular media plays to the younger generations. It diminishes the importance of traditional looks, and they begin to slowly be phased out over time.

Furthermore, consistently throughout history, we've shown it's human nature to correct injustice over time. Already, we have large movements in retaliation over the harmful effects of the beauty industry. The thin ideal, for example, shows stronger backlash through movements, user generated content, and even large businesses every year. Proper business practice includes the shift from a business driven approach to a marketing driven approach, one that looks to benefit the consumer. It is time for marketing within beauty industries to finally follow suit and recognize the beauty in diversity. It's time to market to consumer needs based on naturally occurring segments, rather than creating their problems based on one stark image. The benefits of esteem and psychological health in regard to the economy are correlated (Williams 52), and it seems wasteful to not encourage this from an ethical standpoint. It is important to note that further research should be conducted into other prominent regions, such as the Middle East and Oceana, in the future for a more balanced picture. Similarly, further study would be necessary to go into detail on regions, nations, or even specific populations, as this study was rather broad to include the widespread reach and emphasize the interconnectedness of business and culture with how respect to how international the world has become.

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Trade Liberalization, Emission Standard and Pollution Tax

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Abstract

We use a Cournot oligopoly model to analyze the effect of tariff as the welfare maximizing government imposes an emission standard instead of a pollution tax. We also investigate the effect of free trade on emission standard and examine whether free trade leads to lowering of emission standard.

Keywords: Optimum Tariff; Emission Standard; Welfare; Strategic Trade
JEL classification codes: F10; F 13; F15

1. Introduction

The literature on strategic environmental policy has analyzed the effects of trade liberalization on environment and welfare (see Antweiler, Copeland and Taylor (2001), Barrett (1994), Burguet and Sempere(2003), Conrad (1993), Copeland (1990), Dasgupta and Lee (2012), Kennedy (1994), Lahiri and Ono (2006), Nannerup (1998), Pratlong et all (2005), Sturm (2001), Tsai (1999), Tanguay (2001) and Walz and Wellisch (1997)). The focus of the investigations have been the effect of trade liberalization on pollution tax, emission standard and welfare. Authors such as Barrett (1994), Conrad (1993) and Kennedy (1994) have found that trade liberalization may lead to a lower than efficient (which is equal to marginal damage) pollution tax. This has been called "ecological dumping". In the absence of tariff, environmental tax may act as rent extracting instrument. In other words, by lowering tax, environmental policy is being used as a substitute for trade policy to provide domestic firm a competitive advantage. Authors such as Burguet and Sempere (2003) and Tanguay (2001) have analyzed the effect of free trade on tax and welfare. While Tanguay (2001) has shown that free trade may lower tax and welfare, Burguet and Sempere (2003) have found that welfare and tax may increase under certain conditions. On the one hand, a bilateral reduction in tariff will increase output and lower price. But it also increases damage to the environment. This reduces the incentive for government to use environmental policy strategically to gain competitive advantage by lowering tax and increases incentive to protect environment by raising tax. On the other hand, lower tariff revenue reduces appeal for import and increases appeal for export, thus raising incentive to raise tax. The effect on tax depends on these two opposite effects. As Burguet and Sempere (2003) have shown, either of these two effects may dominate.

Several authors have also investigated impact of trade liberalization when the available instrument is emission standard set by the government (see Abe, Hattori and Kawagoshi (2014), Barrett (1994), Copeland (1990), Lahiri and Ono (2006), Sturm (2001), Tsai (1999) and Walz and Wellisch (1997)). While Walz and Wellisch (1997) found that trade liberalization will increase level of pollution but increase welfare, Tsai (1999) has shown that level of pollution may decrease under free trade. Although Strum (2001) found support for results in Walz and Wellisch (1997), he argued that results hold only under Cournot quantity competition. It is shown that removal of export subsidy will increase both emission per unit and overall emission level. As export subsidy is lowered output and pollution decrease. However, a laxer environmental standard raises output and level of pollution. Under Cournot competition, the later effect dominates. A Bertrand price competition will lower both level of pollution and welfare.

The objective of this paper is to analyze effects of trade liberalization on both The introduction of third country serves two purposes. First, it allows us to check the robustness of the results obtained in the literature. Finally, it also allows us to link the strategic environmental policy literature with the literature on preferential trade agreement (PTA) (see Dasgupta and Lee (2011), Freund (2001)Grossman and Helpman (1994, 1995), Krishna (1998), Ornelas (2008), Panagaria (2000), Panagaria and Dutta Gupta (2002)). In particular, we will be able to analyze the effect of free trade areas on welfare and determine whether countries have an incentive to enter into preferential trade agreement. This paper is the first step in that direction. In section 2, we present the basic model. Section 3 is largely based on the findings of Dasgupta and Lee (2012) in analyzing the effects of trade liberalization on pollution tax. In section 4, we investigate the effect of trade liberalization on emission standard. Finally, section 5 offers some concluding remarks.

2. Model

We consider a reciprocal dumping model of trade (see Brander-Krugman1983 and Brander-Spencer 1985) with three firms located in three countries, Home (1), Foreign (2) and Rest of the World (3). Each firm sells in all three countries. In each of the countries, demand for the good is given by an inverse demand function,

$P_j = A_j - \sum_i q_j^i$, i,j = 1, 2, 3, where q_j^i represents output sold by firm i in jth market.

In each country government maximizes welfare by choosing environmental tax, e^i and import tariff, t^i for i = 1, 2, 3. We assume that d_i, for i = 1, 2, 3, represents damage caused by pollution emitted by each unit of output. Note that we consider only local pollution. Trans-boundary pollution has been addressed by among others Tanguay(2001) and Baksi and Ray Chaudhury(2008).For simplicity, firms have constant marginal costs which are normalized to zero (see Sturm (2001)). We also simplify the analysis by assuming constant and identical marginal damages in all three countries given as follows:

$d_i = d$ for i = 1, 2, 3.

We also assume that $(A_j - d) > 0$ for j = 1, 2, 3. Following Burquet and Sempere (2003), Hamilton and Requet (2004) and Tanguay (2001), we consider a two-stage game. In the first stage Home,

Foreign and Rest of the world governments choose e^i and t^i for i = 1, 2, 3. In the second stage, after observing the choices of the first stage, firms choose their output. It needs to be pointed out that while Burguet and Sempere (2003), Hamilton and Requate (2004) and Tanguay (2001) use a two-country model with Hamilton and Requate (2004) introducing an intermediate good, our paper extends their model to include a third country but does not include intermediate good.

3. Trade Liberalization and Pollution Tax

(3.1) Optimal Tariff and Tax.

We solve the second stage of the game first. Firm j chooses q_i^j for i, j = 1, 2, 3 by maximizing profit, π^j, given t^i and e^j where $\pi^j = \sum_i [A_i - Q_{ii}] q_i^j - \sum_{i \neq j} t^i q_i^j - e^j Q^j$ for i , j =1, 2, 3. Note that $Q_i = \sum_j q_i^j$, $Q^j = \sum_i q_i^j$, e^j and t^i represent consumption in ith nation, production in jth nation, environmental tax in jth nation and tariff imposed by ith nation respectively. Given t^i and e^i, i, j = 1, 2, 3, first order conditions (FOCs) yield the following solutions for q_i^j and q_i^i, i≠ j:

$$q_i^j = \frac{1}{4}\left\{A_i - 2t^i - 3e^j + \sum_{i \neq j} e^j\right\}$$

$$q_i^i = \frac{1}{4}\left\{A_i + 2t^i - 3e^i + \sum_{i \neq j} e^j\right\} \qquad (1)$$

Finally, note that $\pi^j = \sum_i (q_i^j)^2$ for i , j=1, 2, 3.

Government, in the first stage, maximizes welfare, W_i, and chooses t^i and e^i where,

$$W_i = CS_i + \pi^i + TR_i + e^i Q^i - d Q^i \qquad (2)$$

Note, for all i, j =1, 2, 3, $CS_i = \frac{1}{2}(A_i - P_i)Q_i = \frac{1}{2}Q_i^2$, $TR_i = t^i \sum_{i \neq j} q_i^j$, $e^i Q^i$ and dQ^i represent consumers' surplus, tariff revenue, tax revenue and environmental damage respectively.

Using (1), FOCs yield the following solutions for optimum tariff and tax.

$$t^i = \frac{1}{224}\left\{53A_i + 5\sum_{j \neq i} A_j - 63d\right\}$$

$$e^i = \frac{1}{224}\left\{-46A_i + 2\sum_{j \neq i} A_j + 266d\right\} \qquad (3)$$

Finally, substituting t^i and e^i from (3) in (1) we get, for i , j, k =1, 2, 3, i ≠ j, j ≠ k, and i ≠ k,

$$q_i^j = \frac{1}{896}\{68A_j + 132A_i - 60A_k - 140d\}$$

$$q_i^i = \frac{1}{896}\left\{472A_i - 40\sum_{j \neq i} A_j - 392d\right\} \qquad (4)$$

Therefore, using (4), we get,

$$Q^{i_i} = \frac{1}{896}\left\{608A_i + 32\sum_{j\neq i} A_j - 672d\right\}$$

$$Q_i = \frac{1}{896}\left\{736A_i - 32\sum_{j\neq i} A_j - 672d\right\} \qquad (5)$$

Following Bruguet and Sempere (2003), we assume that all three countries have identical demand. That is, $A_j = A$ for all j = 1, 2, 3. Furthermore, we assume that output is tax-elastic. It can be shown that this implies that $A < 1.84d$. As we will see, this assumption will have implication for environmental tax and tax revenue. Using (3), (4), (5), we get, for all i, j = 1, 2, 3 and i≠j,

$$t^i = \frac{9}{32}(A-d)$$

$$e^i = d - \frac{6}{32}(A-d)$$

$$q_i^i = \frac{14}{32}(A-d)$$

$$q_j^i = \frac{5}{32}(A-d)$$

$$Q^i = Q_j = \frac{24}{32}(A-d) \qquad (6)$$

Note that the assumption, A< 1.84d, also guarantees that $e^i > 0$. From (3), (4), (5) and (6) it is clear that higher (resp. lower) marginal damage will result in higher (resp. lower) environmental tax and lower (resp. higher) domestic output and export. Also, higher (resp. lower) marginal damage will lead to lower (resp. higher) optimum tariff. Note that relatively higher marginal damage will make domestic production relatively less attractive and import relatively more attractive. Hence, government has an incentive to encourage import by lowering tariff. In fact, if marginal damage is high enough, optimum tariff may be negative. In other words, an import subsidy may be optimum.

(3.2) *Trade liberalization, Tariff and Pollution Tax.*

In this section we analyze the impact of FTA on tariff and tax where two of the countries form an FTA among themselves. Suppose, without loss of generality, countries 1 and 2 form an FTA where they remove tariff on import from each other while maintaining tariff on import from country 3. We denote tariff imposed on imports from country 3 by countries 1 and 2 by t_F^1 and t_F^2 respectively. Also, t_F^3 represents tariff imposed on imports from countries 1 and 2 by country 3. We let, for i = 1, 2, 3, Q_F^i, Q_{iF}, q_{iF}^j and e_F^i represent consumption, production, output and tax respectively under FTA. In the second stage firms maximize profit under FTA, π_F^i, given by, for i , j = 1, 2,

$$\pi_F^i = \sum_j (A_j - Q_{jF})q_i^j - (A_3 - Q_{3F} - t^3)q_{iF}^3 - e_F^i Q_F^i \text{ and}$$

$$\pi_F^3 = \sum_i (A_i - Q_{iF} - t^i)q_i^3 - (A_3 - Q_F^3)q_{3F}^3 - e_F^3 Q_F^3.$$

FOCs, noting that $A_j = A$ for all j=1, 2, 3, yield the following solutions for i , j =1, 2, i≠ *j* and k = 1, 2, 3,

$$q_{jF}^{i} = \frac{1}{4}(A - 3e_F^i + \sum_{k\neq i} e_F^k + t_F^j)$$

$$q_{3F}^{i} = \frac{1}{4}(A - 3e_F^i + \sum_{k\neq i} e_F^k - 2t_F^3)$$

$$q_{jF}^{3} = \frac{1}{4}(A - 3e_F^3 + \sum_{k\neq j} e_F^k - 3t_F^3)$$

$$q_{3F}^{3} = \frac{1}{4}(A - 3e_F^3 + \sum_{i} e_F^i + 2t_F^3) \qquad (7)$$

For i = 1, 2, 3, letting CS_{iF} and TR_{iF} denote consumers' surplus and tariff revenue respectively under FTA, governments choose tariff and tax, t_F^i and e_F^i respectively, by maximizing W_{iF} , welfare under FTA. Optimal tariff and tax are given as follows:

Using (7) and (3), we get, for i = 1, 2,

$$t_F^i = \frac{54}{707}(A-d)$$

$$e_F^i = \frac{1}{707}\left[-217.5(A-d)+707d\right]$$

$$t_F^3 = \frac{216}{707}(A-d) \text{ and}$$

$$e_F^3 = \frac{1}{707}\left[-132(A-d)+707d\right] \qquad (8)$$

From (8), it is clear that higher (resp. lower) marginal damage leads to lower (resp. higher) tariff and higher (resp. lower) tax. Therefore, relation between marginal damage on the one hand and tariff and tax on the other does not change from the pre-FTA regime. Comparing tariff before and after FTA, note that from (6), $t^i = \frac{9}{32}(A-d)$ for i = 1, 2, 3. Hence, $t_F^i < t^i$ for i = 1, 2. This is well known tariff complementarity effect (Bagwell and Staiger 1997 and Bond et al 2004). When two members of an FTA reduce their tariffs to zero on one another, they each find it attractive to lower tariff on imports from the non-member country. Also, from (6) and (8), $t_F^3 > t^3$ .This is a departure from the result obtained from preferential trade literature where, in the absence of environmental tax as a policy instrument, optimum tariff imposed by nonmember country does not change. However, in the presence of environmental tax, optimum tariff imposed by non-member country increases. Therefore, bilateral free trade agreement between countries 1 and 2 raises optimum tariff imposed by country 3. Finally, comparing optimal tax rate, we observe that although, $e_F^i < e^i$ for i = 1, 2, $e_F^3 > e^3$. Therefore, although a bilateral free trade agreement will lower tax imposed by the FTA members, it raises tax imposed by the third country(rest of the world). This result is similar to the ones obtained by Barrett (1994), Kennedy (1994) and Tanguay (2001) in the sense that free trade lowers tax imposed by FTA members. However, since these authors analyzed the impact of a reduction in tariff on tax in terms of a two-country model, they did not address its impact on tax imposed by rest of the world.

4. **Trade liberalization and Emission Standard:**

For i= 1, 2, 3 production generates emissions according to $\alpha = Q^i$ – a where α represents emissions and a is abatement. Following Sturm (2001), the abatement costs are given by $Z = \frac{a^2}{2}$. Emissions cause purely local damage. The damage function is $D(\alpha) = \frac{d\alpha^2}{2}$ $where\ d$ is the damage parameter. Each country has two policy instruments that can be used. An import tariff, t, and an emission standard, α, that limits maximum emission (by local firm) allowed. Note while Sturm (2001) uses Brander-Spencer model (1985) where two oligopolists compete in a third country for market share, we extend Brander-Krugman model (1983) where three oligopolists compete in each other's market. In the second stage firms choose q_i^j for $i, j = 1,2,3$ by maximizing profit, π^j , given $t^i$and α^j where $\pi^j = \sum_i [A - Q_i]\, q_i^j - \sum_{i \neq j} t^i\, q_i^j - \frac{1}{2}\left(Q^i - \alpha\right)^2 for\ i, j = 1, 2, 3.$

FOCs yield the following solutions for $q_i^i\ and\ q_i^j i \neq jand\ i, j = 1, 2, 3$:

$$q_i^i = \frac{A + \alpha + 4t}{7} \qquad (9)$$

$$q_i^j = \frac{A + \alpha - 3t}{7}$$

From (9), it is clear that higher tariff will result in lower import and higher consumption of domestically produced output. Lower tariff, on the other hand makes import relatively more attractive and domestic production relatively less attractive. Hence, presence of emission standard instead of pollution tax does not change the effect of lower tariff on output. Finally, a higher emission standard, α, or a laxer emission standard will lead to increase in domestic output. This is also similar to the effect of pollution tax on domestic output.

Note for all $i = 1, 2, 3 \quad Q^i = Q_i = \frac{3A+3\alpha-2t}{7}$

Government, in the first stage, maximizes welfare, W_i, and chooses t and α where,

$W_i = CS_i + \pi^j + TR_i - D(\alpha) = \frac{1}{2}Q_i^2 + \sum_i [A - Q_i] q_i^j - \frac{1}{2}\left(Q^i - \alpha\right)^2 - \frac{1}{2} d\alpha^2$

Substituting $q_i^i and\ q_{i,}^j\ i \neq j$, from (9) in FOCs yield optimum tariff and emission standard

$t = (26 + 98dA)/(176 + 343d)$

and (10)

$\alpha = 170A/(176 + 343d)$

Note that (10) can be written as,

$t = 2A/7 - 170A/7(176 + 343d)$ (11)

From (11) we observe that higher environmental damage leads to higher tariff. Higher environmental damage makes domestic production relatively less attractive and import relatively more attractive. Therefore, and welfare maximizing government has an incentive to protect domestic producers and extract rent by raising tariff. Finally, for a given level of tariff, t, setting $(dW\_i)/d\alpha = 0$ and solving for α we get optimum emission level,

$$\alpha = \frac{24A - 2t}{25 + 49d} \qquad (12)$$

From (12) it is clear that a lower tariff will lead to a lowering of emission standard. Higher α implies laxer emission standards. As tariff is lowered nations have incentives to subsidize their local firms by

allowing higher emission. This is consistent with a significant part of the literature on strategic environmental policy (see Barrett (1994), Sturm (2001), Kennedy (1994), Walz and Wellisch (1997), Ulph (1996)). As we have shown in the previous section, lowering or removal of tariff will result in lowering of pollution tax leading to higher pollution ("Ecological Dumping").

5. Conclusion.

The literature on strategic environmental policy has shown that trade liberalization will raise level of pollution by lowering pollution tax or raising the level of emission. We have argued, in this paper, that even if we extend the model by introducing a third country our result is consistent with this conclusion. A lower tariff will encourage import and discourage domestic production. Hence, welfare maximizing government has an incentive to lower the emission standard or pollution tax. In other words, government may use environmental policy as a substitute for trade policy. However, the results shown in this paper differ from those who argue that free trade may raise pollution tax or raise emission standard (see Tsai (1999), Burguet and Sempere (2003)).

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ABSTRACTS

The Problem of Opaque Markets: Value Assessment

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Extended Abstract

Opaque markets have been a topic in finance/economics of some interest in recent times. Researchers study the financial and real estate markets with an interest in the inability of market participant s to know enough about valuations to make judgements about the soundness of the investments and purchases (Bolton et al. 2016, Saporta 1997). The air travel industry has also been researched as an opaque market and the effectives of information technology bring transparency to pricing (Granados et al. 2007). Similarly, Thach and Marshall (2016) have considered the opaque uncertainties of valuations in the fine arts market and the resulting opportunities for fraud. However, these are only examples of the many opaque markets that confound our basic economic models while posing real problems for both buyers and sellers in many of the largest industries in developed economies (Peterson 2014; Jones, Lee, Yeager 2008).

Opaque markets are those where, although there are multiple buyers and sellers and a relatively unrestricted entry and exit barriers and where information on the product and price are either unequally available or difficult to ascertain (Peterson 2014, Jiang 2007). While the emphasis in prior research has focused primarily on bank assets, financial instruments, and certain types of stock markets, the concept can be applied far more broadly and has significant implications for both business to business and consumer markets and to both products and services (Renner and Tyran 2004).

For buyers, whether end-user consumers or institutional, there are many purchase decisions situations in which either the item, although a good, is unique in some way (art, houses), or where the item is a service whose real value is apparent only after purchase and use (haircuts, medical care, consulting). All of these products are traded in markets with some of the properties of a free market, but lack two important factors: price transparency and product comparability. Under such circumstances, factors external to the product, such as seller reputation (Huck and Lünser 2010), may influence perceptions of value and purchase decisions. Some argue that the internet with multiple listings enable price comparisons increases transparency (Granados et al, 2007), but in practice that may tend to favor repeatedly produced products with publically available prices.

Opaque markets are of interest for several reasons. First, these markets include a broad range of service products, which are an increasing share of national economies. Second, few reforms that have been suggested satisfactorily lead to efficiency, even in the finance area. Third, the moral hazards and externalities are great. It is this last area that deserves greater exploration here. The most noted hazard is, of course, that sellers can exploit non-transparency for fun and profit (Bolton et al. 2016; Jiang 2007). It is, of course, also possible that consumers and sellers could do the same, as they frequently do at flea markets, estate sales, and on internet sales sites. A

second moral hazard, as noted by many economists, is the danger of assets held by financial institutions whose current market values are not openly known (Peterson 2014), which can lead to opportunities for misrepresentation and fraud. A third moral hazard is the danger of poor performance in the purely service area where payments and contracts are developed in advance and the quality of the service is disputable, a problem, for example, often experienced by home owners with private contractors.

Moreover, externalities are related to these hazards. Intermediaries arise who add cost but who are present themselves as guides through the thickets of opaque markets. Examples may include art dealers, insurance brokers and advisory services, group legal services, and so forth. Another externality is the difficulty that sellers in these markets have in determining their own prices—from haircuts to art to legal services. In these markets, some prices are known, but many more are not. Determining which the local market standard level in a given locality can be, and often is, a problem leading to either undercharges or unknown loss of business. Finally, in these markets reputation (Huck and Lunser 2010) becomes a primary sales attribute, possibility discouraging the formation and growth of new offerings and limiting other forms of information crucial to consumers' buying decisions.

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The Effectiveness of Group Quizzes as a Learning Tool: A Survey of Student Perceptions

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Abstract

This study will determine the effectiveness of group quizzes as a learning tool in the study of managerial accounting. The literature on group quizzes as a learning tool was reviewed. Quizzes were given to students in one managerial accounting class of 40 students at Arkansas Tech University over one semester. For the first six chapters a quiz was given over the material on an individual basis. Group quizzes were given on the remaining seven chapters. The quiz scores were compared to see if students performed better in the group setting. Also exam scores were compared to see if students performed better on exams after being quizzed in the group setting. Students were asked about their perceptions of group quiz taking as a learning tool in the form of a short survey given at the end of the term. The results are presented. Weaknesses and future research are discussed.

Dr. Mortimer A. Dittenhofer's Contributions to The Accounting Profession

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Abstract

Known as the father of the GAO Yellow Book, he was one of the original authors of the original governmental auditing standards used world-wide. Educator, author, internal auditor, and leader in his profession, Dr. Dittenhofer passed away recently at the age of 102. He served in the Army during WW2 and retired after 32 years as a full colonel. He worked for the Atomic Energy Commission, NASA, HEW and the GAO. He also had been Comptroller for two companies, and practiced internal audit for Sears Roebuck and Company. He continued to consult and write in the field of internal auditing after he became an educator. Dr. Dittenhofer taught at Georgetown University and at Florida International where he was the director of the school of accountancy. There he established the school's internal audit program. He authored at least a dozen textbooks and guides including later editions of Sawyer's Internal Auditing, the most comprehensive textbook and practitioner guide available. He was active in professional organizations serving in leadership roles at the local and national level. He authored several monographs, one for the United Nations and one on Ethics that is a classic in its third edition. He wrote approximately thirty articles and hundreds of case studies. He was a Certified Government Financial Manager, and Certified Internal Auditor. His awards include Institute of Internal Auditors' (IIA) Bradford Cadmus Memorial, Leon R. Radde Educator of the Year, Lifetime Achievement Award, American Hall of Distinguished Audit Practitioners, Macalester College's Distinguished Citizen Award, GAO's Meritorious Service Award, Association of Government Accountants' Gary-Einhorn Achievement Award, AGAs' Lifetime Research Award, Interamerican Accounting Association Distinguished Service Award, AAA's Lifetime Achievement Award, and Association of Government Accountants' Lifetime Achievement Award. I was very fortunate to be able to interview him about his many achievements and gained some insight behind this hero of the accounting profession.

A Quantitative Investigation of the Individual and Organizational Consequences of Servant Leadership

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Abstract

We review the literature on servant leadership and employ meta-analytic techniques to empirically assess the relationship between servant leadership and several organizationally relevant outcomes. Results indicate that servant leadership is positively associated with outcomes such as job performance, organizational citizenship behavior, organizational commitment, and trust. In addition, several potential moderators suggested by previous literature of these servant leadership → outcome relationships were tested in our analysis. Our moderator analyses suggested that servant leadership may have gender specific effects on follower attitudes and behaviors. Further, servant leadership seems to result in more positive outcomes at the group level rather than at the individual level. Implications of our findings and suggestions for future research are discussed.

Cyber Insurance: Protecting Business and Customers in an Electronically Connected Society

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Abstract:

Cyber Insurance is not limited to businesses that retail products on the Internet. Any business entity that stores, maintains, or creates information repositories of business data on a network is subject to intrusion and hacking. Such exposure can ruin a business through unauthorized release of private corporate data, sales information, or other damaging data. This affects not only customer loyalty, but also reflects poorly on the business's ability to maintain a professional standard. Businesses need to have some recourse to cover both direct and indirect losses caused by a cyber intrusion to help repair their reputation and compensate customers or clients who have also been affected by the data loss. When considering Cyber Insurance, the insured should have safeguards in places, and the insurer should conduct a thorough and comprehensive evaluation of those safeguards. These safeguards should include, at a minimum, standards to ensure their IT infrastructure is properly patched and secured, their physical location has appropriate locks and alarms, and that the employees have read, signed, understand, and adhere to the company's Acceptable Use Policy (AUP) when conducting business on company IT resources. This investigation should be conducted within the proper Risk Analysis paradigm which considers the likelihood of an event and the impact to the business should that event occur.