

Spring 2016

# Catholic Social Teaching as an explanation of Firm's environmental impact: Evidence from heavy manufacturing sector

Anne Hetson

*John Carroll University*, [ahetson16@jcu.edu](mailto:ahetson16@jcu.edu)

Follow this and additional works at: <http://collected.jcu.edu/honorspapers>

 Part of the [Business Commons](#), and the [Philosophy Commons](#)

---

## Recommended Citation

Hetson, Anne, "Catholic Social Teaching as an explanation of Firm's environmental impact: Evidence from heavy manufacturing sector" (2016). *Senior Honors Projects*. 100.

<http://collected.jcu.edu/honorspapers/100>

This Honors Paper/Project is brought to you for free and open access by the Theses, Essays, and Senior Honors Projects at Carroll Collected. It has been accepted for inclusion in Senior Honors Projects by an authorized administrator of Carroll Collected. For more information, please contact [connell@jcu.edu](mailto:connell@jcu.edu).

Catholic Social Teaching as an explanation of Firm's environmental impact: Evidence from heavy manufacturing sector

Anne Hetson  
Ernst and Young, LLC  
Audit Associate  
John Carroll University  
Senior Honors Project  
Spring, 2016

Mariah Webinger, PhD  
John Carroll University  
Boler School of Business  
Department of Accountancy  
Email: [mwebinger@jcu.edu](mailto:mwebinger@jcu.edu)  
Phone: 216.397.4225

_____ <b>Name of Student</b> <b>Date</b>	_____ <b>Signature of Student</b>	_____
_____ <b>Name of Primary Advisor</b>	_____ <b>Signature of Primary Advisor</b>	_____ <b>Date</b>
_____ <b>Name of Honors Program Reader</b>	_____ <b>Signature of Honors Program Reader</b>	_____ <b>Date</b>

**This Senior Honors Project has been approved and accepted by the John Carroll University Honors Program,  
in partial fulfillment of the requirements for an Honors Diploma.**

\_\_\_\_\_

## **Abstract**

Catholic Social Teaching theory is examined to identify business variables consistent with Papal Encyclicals. We identified top compensation (pay disparity), stock options (employee autonomy), and number of employees (primacy of labor over capital) as factors that are consistent with Catholic Social Teaching. We then used the “CSR Hub” environmental scores of manufacturing firms. We chose to look at manufacturing companies because of their potential for environmental impact. We find that firms that are consistent with Catholic Social Teaching have stronger environmental practices.

Specifically, our research suggests that the greater the investment in labor, measured by cost of goods sold per employee, and the smaller a firm’s top compensation, the more a firm participates in environmentally sustainable practices. Although stock options are congruent with Catholic Social Teaching, they were determined to not be a relevant factor when measuring a firm’s environmental sustainability. Accordingly, our results indicate that stock options are not an accurate measure of employee autonomy. Although we do not assert that firms are acting the way they are because of Catholic Social Teaching, our results verify that their actions are consistent with the theory.

This research is important in academics in both business and philosophy. The research is important in business academia as professors are teaching about the importance of Corporate Social Responsibility, and how that can positively affect the environment. This research can be beneficial to policy makers as it can help in identifying firms in a better environmental position and factors that are correlated to better environmental practices. Policy makers can consider these factors when incentivizing firms to practice environmental sustainability. Finally, this research is important to business people, as they recognize the implications of catholic social teaching in business on the environment.

## **Introduction**

Catholic Social Teaching is the body of principles and moral teaching expressed and developed through papal encyclicals and conciliar documents. These principles deal with the political, social, and economic aspects of society and the ideals that Catholics should try to institute. The first of these encyclicals is *Rerum Novarum*, published in 1891 by Pope Leo XIII. This was followed by Pius XI's *Quadragesimo Anno* (1931), Paul VI's *Populum Progressio* (1967), and John Paul II's *Laborem Exercens* (1981). The most recent is Pope Francis I's *Laudato Si*, released in 2015, focusing on society's relationship with the earth. In Pope Francis's encyclical, he argues that environmental sustainability is the next major objective companies should achieve, asserting that it is a natural extension of Catholic Social Teaching. Pope Francis claims that "environmental degradation is one of the biggest challenges we have," and that we, as people, must act quickly against this, because "if we destroy creation, creation will destroy us." Therefore, firms which already implement Catholic Social Teaching into their business practices will already have solid environmental practices in place.

This paper analyzes the relationship, pertaining to environmental sustainability, between a manufacturing company's financial statements and its Catholic Social Teaching practices. The study examines accounting variables on each company's 10K financial report and observes how those figures correlate with Catholic Social Teaching in business. Specifically, we analyze how Catholic Social Teaching variables such as top executive compensation, stock options, and number of employees relate to the environment. The results suggest that firms having smaller top

compensation, more employees, and more labor-intensiveness exhibit a stronger environmental performance. We are not able to directly measure if a firm is knowledgeable about Catholic Social Teaching, we only measure and test if their actions are consistent with the theory.

Catholic Social Teaching within a firm will be measured through the correlation between the “CSR Hub” environmental score and each firm’s accounting variables. This is a database that analyzes more than 74 million data points to report Corporate Social Responsibility scores for over 15,000 companies. It distributes these points into twelve subcategories and ultimately into the four main categories of environment, community, governance, and overall performance. This study focuses on the environmental category. Catholic Social Teaching practices in business will help to predict a firm’s environmental practices. This study concerns accounting variables associated with Catholic Social Teaching and their ability to predict firms’ “CSR Hub” environmental scores.

## **Background**

Catholic Social Teaching is mainly developed through papal encyclicals, building on one another. There have been five major encyclicals critical in establishing Catholic Social Teaching, beginning with *Rerum Novarum* and ending with Pope Francis I’s most recent encyclical *Laudato Si*. In the first major encyclical of Catholic Social Teaching, Pope Leo XIII’s *Rerum Novarum* places emphasis on workers’ rights, claiming that all employees should be compensated with decent wages allowing them to live comfortably (Canavan, 1991). Pope Leo XII explains that “wages ought not to be insufficient to support a frugal and well-behaved wage-earner. If through necessity or fear of a worse evil the workman accepts harder conditions because an employer or contractor will afford him no better, he is made the victim of force and

injustice.” (Leo XII, 1891). This encyclical asserts peace is built on the foundation of justice and without just wages and fair pay differential, class warfare will occur.

Pope Leo XII discussed this call for justice further when he said that all members of a firm’s corporate structure should work as equally balanced counterparts to each other. At all levels of a firm’s organization, employees should recognize that each one depends on the existence of the others (Canavan, 1991). With this in mind, more fair and equal treatment of workers will prevail. Paul VI enhances the rights of workers in *Populum Progressio*, proclaiming that every worker should find dignity in employment. Every job should seek “fully rounded development of the whole man and all of men,” to give human life its true meaning (Canavan, 1991). Meaningful work is what, in the end, will be most beneficial to the employee (Tablan, 2014). Fostering such an environment is a major goal of Catholic Social Teaching.

The third major encyclical, Pope Paul VI’s *Populum Progressio*, condemns companies whose key objective is profit, as it carries no corresponding social obligations (Canavan, 1991). Capitalizing on that, the second major encyclical, Pope Pius XI in *Quadragesimo Anno*, called leaders to consistently take into account “not only their own advantage, but also the common good” (Canavan, 1991). He states that God made the world to sustain the human race, and that to divide the world into private possessions is only justified as long “as it does not cease to serve the common interests of all” (Canavan, 1991). He proposes that one way to instill this “common good” in the workplace is by giving workers a share in the ownership and management of businesses, making owners and employees a partnership (Canavan, 1991). These encyclical teachings support our rationale for using top executive compensation as a variable to measure a firm's adherence to Catholic Social Teaching. Interest in the common good and a realization that

all employees need each other, will influence companies to offer less excessive compensation to top executives.

In the fourth major encyclical, Pope John Paul II in *Laborem Exercens* asserted that companies should be decentralized, creating more freedom and room for employee initiative. This freedom would allow workers to apply their autonomy and creativity to their job, deriving greater dignity from their work (Canavan, 1991). We operationalize this call for autonomy and recognition of employee incentives in terms of employee stock option plans. Such plans allow employees to own stock in the company hence to share in the risk and returns of the firm. This encyclical also argues that companies' should prioritize labor rather than capital, as capital is an instrument built by past labor. The emphasis on labor suggests that firms adhering to Catholic Social Teaching will be more labor-intensive relative to their peers in the same industry. Emphasizing the workers will enhance their dignity. The foregoing encyclicals argue that "energies of society flow from below upwards, not from the top down" (Canavan, 1991). Therefore, the encyclicals represent a major call for firms to instill social cooperation rather than class warfare within their human resource and business practices.

The fifth and most recent encyclical by Pope Francis I, entitled *Laudato Si*, calls for a new respect for the earth and acceptance and adherence to ecological practices. Pope Francis argues that this approach to Catholic Social Teaching is inherently social, placing responsibility for the world on every individual, as everyone reaps rewards from the earth. In this encyclical, Pope Francis criticizes big businesses and consumerism for causing so much damage to the world through excessive intervention and waste. Pope Francis claims the most damage occurs in developing countries, as corporations take advantage of their inexpensive resources, exploiting

them and in the process cause depletion of natural resources, deforestation, pollution, and unemployment. Pope Francis argues that the best way to combat this destruction of the earth is to act with a sense of “universal communion;” everything is connected, and we, as people, have a responsibility to each other and the earth.

## **Literature Review**

Catholic Social Teaching is a historic principle becoming more and more prominent in the business world. (Gregg, 2011). With globalization, companies now have many stakeholders, and corporate decisions affect communities around the world (Gregg, 2001). When Catholic Social Teaching is a factor in a business decision making, employees are more likely to have a sense of “community” within the firm (Mele, 2012). This feeling of community causes the employees to operate for the common good of its stakeholders and each other (Mele, 2012). The goal of achieving a common good extends to environmental sustainability practices. The Catholic Church has attempted to bring environmental sustainability to the forefront of Catholic Social Teaching (Butkus and Kolmes, 2007). Catholic Ecological Teaching is emphasized even more so with the new papal encyclical *Laudato Si*, by Pope Francis in 2015, extending Catholic Social Teaching’s expectations for businesses (Francis 2015, Leo, 1891, John Paul, 1981, Benedict, 2009).

There is growing pressure to improve environmental sustainability on the majority of firms. Big brands and the government, especially, are viewed as an example of how to respond to sustainability. Right now, big brand companies have leveraged their environmental sustainability for competitive advantage and market growth, by marketing their sustainable practices to the consumer to gain consumer preference and market share (Dauvergne, Lister, 2012). Research

suggests that corporations must go beyond this goal of internal growth, and with the help of government regulation and individual consumers, to achieve environmental sustainability (Dauvergne, Lister, 2012). Since environmental sustainability has come to the forefront with in the last two decades, there are no generally accepted accounting standards regarding how these environmental practices should be included in the financial reports. Because of this, environmental disclosures are typically incomplete and are not a factual account of the business' practices (Wiseman, 1982). This lack of complete information in environmental disclosures is why we will analyze other financial factors reported in the financial statements to gain a more holistic view of the Catholic Social Teaching being implemented through a firm's environmental practices.

We chose to research environmental practices of heavy manufacturing companies exclusively because of their potentially large impact on the environment. A new trend of "extended producer responsibility" is growing to meet the expectations of society, especially for exporting companies, as they are required to meet the environmental standards of both importing and exporting country (Kee Hung, Wong, Lun, 2014). Many firms choose to manufacture in developing countries with less environmental regulation, because they believe this strategy will be cost-effective as they will have no regulations that need to be met. However, companies are more profitable when they enforce the same strict adherence to their environmental standards in all of the communities they operate in (Dowell, Hart, Yeung, 2001). This means that companies make more money when they adopt globally acceptable environmental practices, even if they company they are operating does not require them. These environmental standards prove to be very important to consumers as companies with a reputation in sustainability leadership have a

higher net income valuation by potential investors, suggesting that adherence to Catholic Social teaching can enhance a firm's bottom line (Lourenço, Callen, Branco, Curto, 2014).

Over the last two decades, there has been extensive research conducted on the benefits of corporate social responsibility for a firm. The external benefits are improved brand reputation and for consumer and stakeholders of the firm, as well as the positive impacts that these practices have on the environment and their community. Firms with strong Corporate Social Responsibility (CSR) practices have high customer loyalty, suggesting that Corporate Social Responsibility is considered in the consumer's decision making process (Hoeffler, Bloom, Keller, 2010). This research also shows there are positive internal benefits from participation in Corporate Social Responsibility. One benefit is increase in employee communication and lower employee turnover. This benefit leads to higher efficiency as firms save resources on hiring and training new employees and experienced employees gain greater knowledge and skill in their work (Hoeffler, Bloom, Keller, 2010). Higher employee morale and the ability to attract better employees are additional benefits gained from these practices, as more and more people want to work for socially conscious companies (Branco, Rodrigues, 2011). One study found that companies that emphasize ethical environmental practices and ethical employees in their strategic planning have significantly higher mean sales growth, return on assets, and pre-tax income ( Ameer, Othman, 2012).

Another benefit of instilling social responsibility in business decisions is the stronger identity employees have for their respective firms, which can improve the external reputation of a firm because employees will be more likely to promote their respective firm. The presense of CSR practices within a firm also increase employee efficacy because employees will have more

pride in their work (Korschun, Bhattacharya, Swain, 2014). The negative effect on earnings per share of these practices does not seem to bother investors (Dhaliwal, Zhen Li, Tsang, and Yang, 2011). Companies that instill Catholic Social Teaching through their corporate social responsibility practices are more likely to attract dedicated investors (Dhaliwal, Zhen Li, Tsang, and Yang, 2011). Executive compensation is another factor that may be lower due to Catholic Social Teaching (Hart, Parthiban, Shao, Fox, Westermann-Behaylo, 2015). This study involves a culmination of these internal and external factors, because, in theory, there will be a correlation between how a company implements Catholic Social Teaching and how it treats the environment (Francis I, 2015). Therefore, these aspects of Catholic Social Teaching will help garner more of an understanding of the total effect on the 10K financial statements and bottom line of a company.

One way that manufacturing firms are responding to this new pressure is through a system of “Green Supply Chain Management”. Under this system, manufacturers and members of the supply chain work closely together to create or enhance environmental sustainability through process like reducing waste. One study showed a positive significant correlation between this environmental supply chain management and accounting based performance measures ( Golicic, Smith, 2013). Adherence to environmental standards throughout the supply chain also created a better relationship with the suppliers that led to stronger operational performance.

One of the major critiques of CSR is that these practices reduce a firm’s earning per share (Dhaliwal, Zhen Li, Tsang, and Yang, 2011). Earnings per share is often used as an indicator of a firm’s profitability and is often relied upon by investors when analyzing the performance of a

company. The reduction in earnings per share may deter companies from investing in Corporate Social Responsibility as it may cause them to lose investors.

### **Methodology**

The research involves analysis of corporate 10K annual reports and “CSR Hub” scores. This study examines over 100 companies producing heavy machinery, oil, equipment and parts. Manufacturing companies are chosen in view of their impact on the environment. Financial reports of these companies are analyzed to measure the extent of their implementation of Catholic Social Teaching.

### ***Variables***

This study considers employment stock options as Pope Pius XI calls for employees to have ownership of their company to improve the partnership between employees and owners in the encyclical, *Quadregesimo Anno*. He argued that, “the work-contract be somewhat modified by a partnership-contract....Workers and other employees [should] thus become sharers in ownership or management or participate in some fashion in the profits received.” (Pius XI, 1931) Stock options offered to employees are a good measure for Pope Pius XI’s objective, as they are distributions to employees that give the employees the ability to gain ownership in the company for which they work. Pope Pius XI would suggest that all employees should be offered stock options.

Two additional variables analyzed will be the number of employees within a company and cost of goods sold divided by the number of employees. These variables measure a company’s reliance on labor, consistent with Pope John Paul II’s priorities stated in *Laborem Exercens* that, “the hierarchy of values and the profound meaning of work itself require that

capital should be at the service of labor and not labor at the service of capital” (John Paul II, 1981). He argues that human dignity is intertwined with the value of one’s work, and that value should be placed on their labor, not the capital which they use. Using the number of employees in a company and the company’s cost of goods sold per employee will capture the company’s labor intensity.

Finally, top executive compensation and the average total compensation of the next four highest paid employees in an organization are measured. These variables reflect the extent to which Pope Leo XII’s teachings in the encyclical *Rerum Novarum* are practiced within the company. Based on Catholic Social Teaching, there is an injustice that comes with pay disparity (Kohls, Christensen, 2002). Pope Pius XI also recognizes the injustice that comes with pay disparity as, “it is contrary to social justice when, for the sake of personal gain and without regard for the common good, wages and salaries are excessively lowered or raised” (Pius, XI, 1931). Measuring the top compensation and the average of the next four top compensated employees captures the breadth of pay disparity within each company. These two variables that have been separated as total top compensation are typically more significant than the next highest paid employees. By separating the two variables, the risk of skewing the averages due to extremely high top compensation is eliminated.

Based on these variables, three tests are performed. First, a descriptive statistics analysis is performed on the independent variables to get a sense of the spread of the data among the companies. Then, a test of means is performed separating the independent variables into quartiles. The means of the highest group and the lowest group are evaluated for statistical significance. Finally, a regression analysis is conducted, with the “CSR Hub” environmental

score as the dependent variable and the financial reports figures as the independent variables analyzed.

## **Results**

[Insert Table I]

In Table I, the sample size is explained. For a company to be analyzed in this survey, it must be categorized as heavy machinery, equipment, and oil manufacturers under the Security and Exchange Commission's guidelines. Those companies listed in such categories were then searched in the "CSR Hub" database. If the company had a "CSR Hub" score report, it was included in the initial sample size of 102 companies. Next, companies' 2014 Proxy Statements and 2014 10K Annual Reports were analyzed. If a company did not publish a 2014 Proxy Statement or Annual Report, it was removed from the sample, eliminating 38 companies, most of which were international and not required to publish a proxy statement. Finally, an outlier was removed, after analyzing the descriptive statistics of the sample size and observing that the company's minimal top compensation to its CEO could potentially distort the results of the study. A final sample size of 63 companies was established.

Using the descriptive statistics, Tesla Motors, was eliminated from the study. This company was a major outlier with regards to top compensation, as its CEO, Elon Musk, had total compensation of \$35,360 in 2014. The next highest top compensation was nearly 10 times as much, which is Vertex Energy Inc., a company with one-fiftieth the revenue of Tesla. Therefore, Tesla's top compensation was disproportionate to the study and had the potential to skew the results. Excluding Tesla, all other companies analyzed had proportionate 2014 revenues and top compensation.

[Insert Table II]

In Table II, Descriptive Statistics, it is important to note the large variation in total top compensation even after eliminating the outlier, which includes salary, stock options, and annual incentives. The highest top compensation of \$33,096,312 is from Exxon Mobil, and the next highest is \$25,070,417. However, when looking at Exxon Mobil's financial statements, it reported the second highest revenue of the companies, and had the fifth number of employees, a logical explanation for its high top compensation. The five highest executive compensations are from oil manufacturing companies.

It is also important to note from Table II, that only 17% of the 63 heavy machinery and oil manufacturing companies analyzed in this study provide stock options to all employees. Based on the financial statements analyzed, the majority of these companies issue stock options only to top executives and key employees. We coded companies as not having stock option plans if there were available only to top executives and key employees. This is not in alignment with Catholic Social Teaching because as said in Pope Leo XII's encyclical *Quadragesimo Anno* all workers should share in the distribution of created goods, not just certain employees.

Table II also shows large variance for cost of goods sold divided by number of employees in each company. Two companies have a substantially lower cost of goods sold per employee, with the second smallest being \$8,653 per employee and the minimum \$2,443. The lowest cost of goods sold per employee is from Sun Hydraulics. As this is an international company, hiring employees globally, it secures cheaper labor, and is able to invest in more employees, lowering the cost of goods sold per employee.

[Insert Table III]

Table III represents the Environmental Test of Means Difference. Quartile 1, representing the bottom fourth or minimum values of the variables, was tested against Quartile 4, the top fourth or the maximum values. The test analyzed the difference in environmental score between the mean of Quartile 1 against the mean of Quartile 4.

Using the Test of Means Difference, the ratio of cost of goods sold per employee is a significant variable. The lower the cost of goods sold per employee, the higher the environmental score, suggesting that a company that is more labor-intensive than capital intensive has a higher environmental score.

[Insert Table IV]

Table VI shows the results of the regression test, with each company's environmental score as the independent variable. It is important to note that the major difference in each regression test is the variable used to measure investment in employees and whether or not we include both top compensation and average of the next four highest compensated. Both the first and fourth regression tests suggest that the number of employees is positively significant, which means that the more people a company employs, the higher the company's environmental score. The second and third regression tests suggest that cost of goods sold per employee is negatively significant, meaning that the lower the cost of goods sold per employee the higher the environmental score. This again suggests that the more people in whom a company invests, the

higher the environmental score. This result is robust to both measurements and consistent across all measurements of executive compensation.

The fourth regression test reflects top compensation as negatively significant, meaning the less a company pays to its top executive, the more environmentally friendly the company will be. This provides evidence that pay equality is also indicative of environmental performance, consistent with the Catholic Social Teaching established in the Papal Encyclical *Rerum Novarum*. This variable is not significant when measured against cost of goods sold per employee in the second regression test, most likely because this ratio captures an element of pay equality. Perhaps the two independent variables are correlated, and then the regression results are subject to multicollinearity. Also, we do not find this relationship when the average of the next four highest compensated executives is included. A relationship between the highest and the next four highest paid is likely, and might affect our ability to find the result when both variables are included.

Taken as a whole, the tests provide evidence that a labor-intensive firm is a principal indicator of its environmental score. The more labor-intensive a firm is, the better its environmental impact. These results are consistent with the Catholic Social Teaching established in *Laborem Exercens*, in which Pope John Paul II argues that capital is simply the result of past labor. This also corresponds with Pope Leo XIII's call to look out for the common good of all employees because the firm's focus is more on the employees rather than on the capital of the firm. This fosters a sort of community within the firm, where the employees work towards the common good. Also, since there is more of an emphasis on labor rather than capital, the company is more willing to focus on what is best for its employees. The tests also suggest that

pay equality is correlated with environmental performance. This aligns with Pope Leo XIII's *Rerum Nevarum*, which calls for just wages and an end to pay disparity.

### **Implications and Limitations**

This research supports the assertion that the environmental orientation in the most recent papal encyclical *Laudato Si* is simply an extension and development of Catholic Social Teaching that began with *Rerum Novarum*. We find that accounting variables that measure investment in employees and low pay disparity are significant predictors of a firm's environmental performance. Investment in employees, or the idea of prioritizing labor over capital was put forth by Pope John Paul II in *Laborem Exercens*. The idea of mutual dependence and a rationale for low pay disparity was promoted both by Pope Paul VI in *Quadragesimo Anno* and by Pope Pius XI in *Populorum Progressio*. We find that heavy manufacturing firms with relatively higher investment in labor and lower pay disparity compared to their industry peers also have higher environmental scores. The evidence is consistent with the idea that Pope Francis' call for greater environmental awareness and responsibility is a natural extension and development of Catholic Social Teaching.

These results have implications for industry, academia, and policy making. First, the implication that heavy investment in employees leads to stronger environmental performance will be of interest to firms wishing to adhere to Catholic Social Teaching. The study suggests possible firm structures for environmental success specifically, that environmental stewardship is related to low top compensation and a large workforce. Employee ownership, as measured by employee stock options, seems to be a less effective measurement as it may not accurately

capture Catholic Social Teaching. Also, we do not suggest that firms are intentionally practicing Catholic Social Teaching, or CRS, but that their decisions and actions are consistent it.

Second, this research will also be of interest to firms seeking to become more environmentally friendly. It suggests that firm's focus should be on employees rather than capital, and that firms should work to enact a more equal pay distribution.

Third, this research will be of interest to academics, especially in illustrating how Catholic Social Teaching correlates with business decisions. It provides evidence for Catholic Social Teaching to be incorporated into Corporate Social Responsibility instruction for comprehensive coverage of business impact on society. Last, policy makers will find this research interesting. Those wishing to protect the environment may want to consider the other related business factors such as executive compensation and labor intensity when developing public policy.

This research also has several limitations. First, the sample is from current firm related performance. If variables were measured before *Laudato Si*, there might be different effects on environmental practices. The study was limited to variables that Catholic Social Teaching identifies, which can be operationalized using publicly available accounting data. The inclusion of additional variables or other measurement techniques of the concepts used may yield different results. Specifically, it would be desirable to develop and test different ways of measuring employee empowerment as employee stock options do not have a significant effect on the environmental score. Perhaps a more direct measure of decentralization, employee autonomy and empowerment, may impact the environmental stewardship of the organization.

## **Conclusions**

Pope Francis calls upon people to respect the laws of nature and the delicate equilibrium of the planet. We should use the Earth's resources responsibly as they were given to us as a gift from God. The results suggest that firms already implementing Catholic Social Teaching in their business decisions have stronger environmental practices. In particular, we find firms with more employees and a higher cost of goods sold per employee ratio have higher environmental scores. This is congruent with the Catholic Social Teaching established by Pope John Paul II, as he argued that firms should place more emphasis on labor and less on capital. Total top executive compensation also had a significant negative correlation with firm's environmental scores. This suggests that firms paying their top executives less have stronger environmental scores, consistent with Pope Leo XIII's call to end pay disparity.

The results are valuable to academics in terms of the connection between environmental sustainability and business practices based on Catholic Social Teaching. Once they see this relationship, they may be more inspired to emphasize these practices to their students to advance environmental sustainability. If policymakers were to understand the results found in the study, they might pursue more beneficial legislation to improve environmental sustainability. Although, we do not suggest that firms are intentionally using Catholic Social Teaching, we find that the theory can explain their behavior. Finally, the connection between Catholic Social Teaching in businesses and environmental sustainability is important for society to make, as people will seek employment in socially responsible firms.

## Bibliography

- Ameer, Rashid, Othman, Radiah (2012). Sustainability Practices and Corporate Financial Performance: A Study Based on the Top Global Corporations. *Journal of Business Ethics* June 2012, Vol. 108, No. 1, pp. 61-79.
- Benedict XVI, *Caritas in Veritate*: Encyclical Letter of His Holiness Pope Benedict XVI on the Charity in Truth. 29 June, 2009.
- Bhadauria, Vikram, Green Jr, Kenneth, Meacham, Jeramy, and Zelbst, Pamela (2012). Green Supply Chain Management Practices: Impact on Performances. *Supply Chain Management: An International Journal*, Vol. 17, No. 2, pp. 290-305.
- Bhattacharya, C.B., Korschun, Daniel, Swain, Scott (2014). Corporate Social Responsibility, Customer Orientation, and the Job Performance of Frontline Employees. *Journal of Marketing* May 2014, Vol. 78, No. 3, pp. 20-37.
- Bloom, Paul, Hoeffler, Steve, and Lane Keller, Kevin (2010). Understanding Stakeholder Responses to Corporate Citizenship Initiatives: Managerial Guidelines and Research Directions. *Journal of Public Policy & Marketing*: Spring 2010, Vol. 29, No. 1, pp. 78-88.
- Branco, Manuel, Callen, Jeffrey, Dias Curto, Jose, and Lourenço, Isabel (2014). The Value Relevance of Reputation for Sustainability Leadership. *Journal of Business Ethics* January 2014, Volume 119, No. 1, pp 17-28.
- Branco, Manuel, and Rodrigues, Lúcia (2011). Corporate Social Responsibility and Resource-Based Perspectives. *Journal of Business Ethics* December 2006, Volume 69, No. 2, pp 111-132.
- Butkus, Russell A. and Kolmes, Steve, "Ecology and the Common Good: Sustainability and Catholic Social Teaching" (2007). *Journal of Catholic Social Thought*. 2007. Volume 4. No. 2. pp. 403-436.
- Canavan, Francis, "The Popes and the Economy" (1997). *Notre Dame Journal of Law, Ethics, and Public Policy*. 1997. Volume 11. No. 2. pp. 42-59.
- Christensen, Sandra, and Kohls, John (2002). The Business Responsibility for Wealth Distribution in a Globalized Political-Economy: Merging Moral Economics and Catholic Social Teaching. *Journal of Business Ethics* February 2002, Vol. 35, No. 3, pp. 223-234.
- Dauvergne, Peter and Lister, Jane (2012). Big brand sustainability: Governance prospects and environmental limits. *Global Environmental Change* Volume 22, No. 1, February 2012. pp. 36-45.

Dhaliwal, Dan, Tsang, Albert, Yang, Yong George, and Zhen Li, Oliver (2011). Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. *The Accounting Review*: January 2011, Vol. 86, No. 1, pp. 59-100.

Dowell, Glen, Hart, Stuart and Yeung, Bernard (2001). Do Corporate Global Environmental Standards Create or Destroy market Value? *Management Science*, August 2000, Vol 46, No. 8, pp. 1059-1074.

Francis, Laudato Si: Encyclical Letter of His Holiness Pope Francis I, on Care for our Common Home. Vatican City: Liberia Editrice Vaticana. May, 2015.

Fox, Corey, Hart, Timothy, Pathiban, David, Shao, Feibo, and Westermann-Behaylo, Michelle. An Examination of the Impact of Executive Compensation Disparity on Corporate Social Performance. *Strategic Organization*. August 2015. pp 220-223.

Golicic, Susan and Smith, Carol (2013). A Meta- Analysis of Environmentally Sustainable Supply Chain Management Practices and Firm Performance. *Journal of Supply Chain Management*. April 2013. Vol. 49, No. 2, pp. 78-95.

Gregg, Samuel (2001). Globalization and the Insights of Catholic Social Teaching. *Journal of Markets and Morality*. Spring 2001. Volume 4, Number 1, pp 1-13.

John Paul II. *Laborem Exercens*: Encyclical Letter of His Holiness Pope John Paul II, on Human Work. Vatican City: Liberia Editrice Vaticana. September, 1981.

Lai, Kee-hung, Lun, Venus, and Wong, Christina (2014). The Role of Customer Integration in Extended Producer Responsibility: A Study of Chinese Export Manufacturers. *International Journal of Production Economics*, 2014, vol. 147, No. 2. pp. 284-293.

Leo XIII. *Rerum Nevarum*: Encyclical Letter of His Holiness Pope Leo XIII, on Rights and Duties of Capital and Labor. Vatican City: Liberia Editrice Vaticana. May, 1891.

Mele, Domenec. (2012), "The Firm as a "Community of Persons": A Pillar of Humanistic Business Ethos". *Journal of Business Ethics*. March 2012, Vol. 106, No. 1, pp 89-101.

Pius XI. *Quadragesimo Anno*: Encyclical of His Holiness Pope Pius XI, on Reconstruction of the Social Order. Vatican City: Liberia Editrice Vaticana. May, 1931.

Tablan, Ferdinand (2015). Catholic Social Teachings: Toward Meaningful Work. *Journal of Business Ethics*. May 2015, Vol. 128, No. 2, pp. 291-303.

Wiseman, Joanne (1982). "An evaluation of environmental disclosures made in corporate annual reports." *Accounting, Organizations and Society*. 1982, Volume 7. No. 1. pp 53-63.

Table I  
Sample Size

	Sample Size
Initial	102
Companies without Adequate Financial Reports	38
Outlier	1
Final Sample Size	63

Table II  
Descriptive Statistics

Variable	n	Mean	Minimum	Maximum	Standard Deviation
Top Compensation	63	\$ 8,938,735.63	\$ 322,786.00	\$ 33,096,312.00	\$ 7,365,113.40
Average 4 Top Compensation	63	\$ 1,413,247.35	\$ 288,505.00	\$ 15,005,563.00	\$ 2,720,415.79
Employees	63	33,835.29	225.00	379,592.00	70,150.02
Cost of Goods Sold/ Employees	63	\$ 1,413,247.35	\$ 2,443.00	\$ 11,737,804.00	\$ 2,565,625.35
Stock Options	63	0.17	0	1	0.383

Table III

Test of Environmental Means between Quartiles 1 and 4

Variable	Mean Difference	T	P-Value
Total Top Compensation	-1.063	-0.382	0.232
Average Four Compensation	-0.938	-0.36	0.721
Employees	-4.25	-1.623	0.115
Cost of Goods Sold/ Employees	8.25	3.511	0.001***
Stock Options	-1.263	-0.582	0.563

Table IV  
 Test of Regression  
 Dependent Variable = Environmental Score

Variable	Test I	Test III	Test IV	Test II
Constant	57.488 (43.416)** *	57.748 (43.449)***	57.585 (43.973)***	57.837 (44.168)***
Total Top Compensation	-.00000035 (-1.465)	.0000000073 8 (.028)	-.0000002184 <b>(-1.690)*</b>	.0000001265 (1.055)
Average Four Compensation	.000000435 (.656)	.0000003441 (.516)		
Employees	.0000395 <b>(2.832)**</b>		.00004169 <b>(3.096)**</b>	
Cost of Goods Sold/ Employees		-.00000106 <b>(-2.929)**</b>		-.0000001112 <b>(-3.219)**</b>
Stock Options	2.122 (.977)	.189 (.086)	2.117 (.979)	.093 (.043)
R <sup>2</sup>	0.152	1.60	0.141	0.156
N	63	63	63	63

\* Significance <.1

\*\* Significance <.01

\*\*\* Significance <.001