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FROM THE EDITOR

It is an honor and a privilege for me to take over the editorship of the *Review of Business*. Professors Igor M. Tomic and Nicos A. Scordis have built a strong and influential publication, shaping how we think about academic issues in business and how business manages and engages with risk or uncertainty. RoB created an academic platform that values scholarship from various business disciplines and contributes research on how business practices impact society.

Taking suggestions from leaders of the business schools and worldly renowned scholars from various business fields, RoB has created a core advisory group to guide the direction and operation of the journal, and to continue the significant upward trend of the journal. The members of this group, alphabetically, are:

- Iftekhar Hasan (Fordham University, Bank of Finland, and University of Sydney)
- Kose John (New York University)
- Steven Ongena (University of Zurich, Swiss Finance Institute, KU Leuven, and Center for Economic and Policy Research [CEPR])
- Raghavendra Rau (University of Cambridge)
- David Reeb (National University of Singapore)

With the help and suggestions from the advisory board, we have also created a new international editorial board with outstanding researchers in various business fields. The members of this group, alphabetically, are:

- Turanay Caner (North Carolina State University, United States)
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- Hao Zhang (Rochester Institute of Technology, United States)

RoB aims to publish original research articles in all academic fields of business, both theoretical and empirical, that will significantly contribute to the literature of business and allied disciplines. As we look forward to the next phase of RoB, we want to realign the direction of the journal with ongoing trends in modern business. More specifically, RoB advocates for research articles on imminent topics, such as sustainable development, business ethics, technology-related business issues, and subjects that enrich the interdisciplinary understanding of business.

Accordingly, we want to set forth a few principles that will guide us in taking the journal forward. These principles are made to encourage intellectual contributions from the academic community and facilitate conversation and collaboration among various business disciplines.

1. Bridge the academic scholarship. We want to provide a solid and cooperative platform for the conversations between the authors and reviewers. For the authors, we will assign the research papers to the proper reviewers in a timely manner. For the reviewers, we hope to streamline the process by only sending them papers that are worthy of their attention. We want to bridge the authors and reviewers in a way that reviewers can make an informed judgment and help the authors improve the quality and integrity of research.
2. Enhance the pluralist intellectual contribution. We want to broaden the scope of the disciplines that are relevant to business. We want to encourage business topics that tell stories from a broader perspective, such as social science, environmental policy, technology in business, political spectrum, etc. We hope that the concept of pluralist intellectual contribution becomes the hallmark of the journal in its next phase.
3. Expand the diversity of scholarship. We will continue to make the journal inclusive. We welcome authors and research papers that represent diverse geographic, racial, ethnic, gender, and economic backgrounds.

In observing the new direction of the journal, the June 2020 issue of RoB features four interesting papers.

The lead article—“Is Corruption a Greater Evil than Sin?”—uses World Values Survey data covering 59 countries and unearths new evidence on the relation between religion and attitudes toward corruption at the individual level. The authors find that religious people are more averse to corruption, supporting the view that religiosity favors honest behavior. Attitudes toward corruption differ across religious denominations. Protestantism and Hinduism are associated with greater aversion to corruption than atheism, while other religious denominations do not have clear differences.

The next two works explore the influence of various organizational forms. “Organizational Forms and the Contracts of Bank Loans” considers all three important organizational forms—industrial diversification, global diversification, and geographic dispersion—in an empirical framework to find out which types of diversification matter for contracting bank loans. The author finds that, on average, globally diversified firms could incur a 7.7 to 14.5 percent increase in loan pricing compared to the concentrated firms or the firms that are not diversified in any dimension. The other types of firms incurring a higher cost of bank debt are the firms that are only geographically dispersed and the firms that are diversified in all three forms.

In “Unionization and Firm Inventory Management: Empirical Evidence,” the authors document that firms with union election wins have significantly lower inventory levels. This negative relation is more prominent for firms that have higher labor costs, less operational flexibility, and are financially constrained. The authors also point out that firms in states with stronger labor rights or with higher labor intensity are associated with lower inventory investment after successful union elections.

The last paper delves into sustainable development. In “Consumer Values and Misbehavior in the Context of Sustainable Consumption,” the authors examine the relationship between social values of consumers and their attitudes toward misbehavior in the context of sustainable consumption. Results show that when consumers desire to transcend themselves with universalism, benevolence, or conservatism, they have negative attitudes toward misbehavior. The article considers how consumers who represent those values are more willing to adopt the concept of sustainable consumption.

In conclusion, we believe that the new direction of RoB is challenging and could be rewarding. We look forward to working with all of you as we continue to make RoB a success. We welcome your submissions, as well as feedback as authors, readers, and reviewers of the journal.

Yun Zhu, Editor

Is Corruption a Greater Evil than Sin?

Cigdem Borke Tunali

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Abstract

Motivation: Culture can shape institutions and thus economic growth through the impact of religion on corruption.

Premise: The aim of this paper is to provide new evidence on the relation between religion and attitudes toward corruption at the individual level.

Approach: Using World Values Survey data covering 59 countries during the period 2010–2014, we perform regressions to examine if religiosity and religious denominations are associated with attitudes toward corruption.

Results: We find that religious people are more averse to corruption, supporting the view that religiosity favors honest behavior. Attitudes toward corruption differ across religious denominations. Protestantism and Hinduism are associated with greater aversion to corruption than atheism, while other religious denominations do not have clear differences. This conclusion accords with the view that hierarchical religions favor greater tolerance of corruption than individualistic religions. Additional estimations on groups of countries with different dominant religions and on multi-religious countries show however that the relation between religious denomination and tolerance of corruption can vary with the religious environment of the country.

Conclusion: We contribute to the identification of the determinants of corruption by showing that religiosity matters, while religious denomination plays a role that can differ across countries.

Consistency: Corruption is a major cause of risk and uncertainty for business decisions all over the world. This paper contributes to appraise what shapes corruption and thus affects risk and uncertainty. It then gives evidence on cross-country differences in risk and uncertainty generated by religion.

Keywords: corruption, religion

JEL Classification Codes: H11, K42, Z12

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INTRODUCTION

“Corruption is a greater evil than sin.”

—POPE FRANCIS

The debate on the causes of economic development is far from settled. Acemoglu and Robinson (2012) argue that institutions give rise to economic growth, but give little credit to the potential impact of culture. However, others claim that even if institutions explain why countries are rich or poor, culture can explain the institutions (Greif 1994; North 2005).

A channel through which culture can shape institutions is the impact of religion on corruption. Corruption is a core dimension of institutions that has been shown to have detrimental effects on investment and growth (Mauro 1995). As such, corruption constitutes a major piece of the institutions–growth nexus.

Religion can exert an impact on tolerance of corruption in different ways. First, religiosity is expected to promote honest behavior. While the abovementioned quotation of Pope Francis illustrates the view of Catholicism, Islam prohibits corruption, as shown with the Hadith of Prophet Muhammad: “The curse of Allah is upon the one who offers a bribe and the one who takes it.” North, Orman, and Gwin (2013) observe that religion as a whole helps sustain a social order by encouraging standards for behavior. As a consequence, religious people may be more prone to good social behavior and may then have lower tolerance of corruption. Secondly, religious denominations can exert different influences on attitudes toward corruption depending on whether they are hierarchical or individualistic religions. Putnam (1993) considers that hierarchical religions (Catholicism, Orthodox Christianity, and Islam) create vertical bonds of obligation in society. Treisman (2000) argues that hierarchical religions favor attitudes with respect for authority and therefore lead to lower contestation of office-holders. Hierarchical religions should therefore be associated with higher tolerance of corruption than individualistic religions like Protestantism.

A large body of empirical literature has investigated the determinants of corruption, including religion. However, most works about the impact of religion on corruption consider a country-level investigation (La Porta et al. 1997; Treisman 2000; Gokcekus 2008; North, Orman, and Gwin 2013). As a consequence, they cannot take into account the heterogeneity of individuals inside a country because they aggregate all individuals. Also, they do not investigate whether the behavior of individuals related to corruption is conditional to the fact that their religion dominates their country, or if a minority group status influences attitudes (Kuran 2004).

Very few works provide a micro-level analysis on the impact of religion on corruption. Guiso, Sapienza, and Zingales (2003) provide a broad investigation of the links between religion and economic attitudes in which they document the relation between religion and attitudes toward corruption. They find support for the impact of religiosity and religious denominations.

The aim of our paper is to investigate how religion affects attitudes toward corruption. To address this issue, we use the latest wave of the World Values Survey. It contains information on human beliefs and values in 59 countries. We advance the understanding of the relation between religion and attitudes toward corruption in two respects.

First, we provide a cross-country analysis investigating the relation between religion and attitudes toward corruption at the individual level. Religion is considered through religious denominations and religiosity. We are therefore able to provide an in-depth investigation of the influence of religion on tolerance of corruption in comparison to country-level analyses. In comparison with Guiso, Sapienza, and Zingales (2003) who use the three waves implemented between 1981 and 1997, we utilize the most recent available data from the World Values Survey wave performed in the period 2010–2014.

Second, we examine how the influence of religious denominations can be conditional to the importance of other religions. For instance, the behavior of Protestants is different if it is a majority religion or a minority religion in a country. In that latter case, do Protestants behave more like the majority of the country or like Protestants all around the world? By comparing the attitudes of individuals toward corruption across countries with different majority religions, we are able to check whether the relation between religious denominations and tolerance of corruption is universal or conditional to the status of the religion. To obtain a more complete picture, we also examine the impact of religious denominations in four countries with several large religious groups (Germany, Lebanon, Malaysia, and Nigeria) so that we have a thorough comparison of the potential influence of Catholicism, Protestantism, and Islam on attitudes toward corruption. We thus provide a much deeper investigation of the impact of religion on corruption than Guiso, Sapienza, and Zingales (2003).

Our paper relates to two current strands of the literature. The first strand of the literature incorporates the debate on the influence of religion on economic outcomes. Following Barro and McCleary (2003), there is a considerable body of literature on how religion shapes economic attitudes (Guiso, Sapienza, and Zingales 2003; Callen and Fang 2015; Bénabou, Ticchi, and Vindigni 2015). Our worldwide micro-level analysis, taking into account the majority or minority status of a religion, provides a contribution on how religion can shape institutions.

The second strand of the literature deals with the determinants of corruption. We supplement the investigation of the determinants of corruption at the macro level (Treisman 2000; Gokcekus 2008) by adding information on how a key element of cultural values, religion, influences tolerance of corruption at the individual level and by focusing on attitudes toward corruption rather than actual or perceived corruption. Understanding attitudes toward corruption can enhance the efficiency of policies implemented to prevent corruption, and as such can help reduce it. If one religion favors tolerance of corruption in a global way, then reducing corruption in countries with this religion for the majority of people can be particularly difficult.

The paper is divided into the following major sections:

- Hypotheses and Related Literature
- Data and Methodology
- Results
- Conclusion

HYPOTHESES AND RELATED LITERATURE

This section is devoted to the background of our research question. We first develop the hypotheses on the relation between corruption and religion. We then review the former studies on this link.

Hypotheses

Corruption is generally defined as “the use of public office for private gains, where an official (the agent) entrusted with carrying out a task by the public (the principal) engages in some sort of malfeasance for private enrichment which is difficult to monitor for the principal” (Bardhan 1997, p. 1321). Although almost all countries have experienced corruption scandals, the frequency and intensity of these scandals dramatically change from one country to another. However, researchers have taken these differences between countries as given for a long time (Treisman 2007). In recent years, with the emergence of various indices that measure the level of corruption at the country level, research has started to investigate the causes and the consequences of corruption.

Although there are many factors that affect the eagerness of a person to be involved in corruption, religion can be one of the significant determinants of corrupt practices in a society (Beets 2007). At first glance, since most religions establish some standards for behavior, a more religious society may be more inclined to be honest and to obey the rules than a less religious society (North, Orman, and Gwin 2013). So it may be expected that corruption is a more severe problem in societies that are not pious compared with the ones in which religion is an important part of people’s daily lives.

However, the observed discrepancies in terms of frequency and intensity of corruption among societies that adhere to different religions suggest that there may be significant differences between religions that explain why some countries are more corrupt than the others. In fact, the majority of studies in the existing literature put forward that, based on the prevalent values and belief systems in a specific religious sect, religion could either decrease or increase corruption (Sommer, Bloom, and Arikan 2013).

Treisman (2000) states that religion determines the attitudes of a society toward social hierarchy, and he argues that in societies where hierarchical religions (Catholicism, Eastern Orthodoxy, and Islam) are dominant, defying a civil servant may be more uncommon than in societies where egalitarian or individualistic religions (for example, Protestantism) are dominant.¹ Furthermore, hierarchical religions place more emphasis on being loyal to family and friends than the individualistic religions. This is called *familism* and may influence the level of nepotism in a society (Banfield 1958). In addition, people who adhere to hierarchical religions trust less in others than the people who belong to individualistic religions. Referring to Putnam (1993), La Porta et al. (1997) argue that hierarchical religions have a negative effect on the formation of trust because their emphasis on vertical ties between subordinate and superior, and thus leads to higher corruption than individualistic religions.

¹Treisman (2000) takes the taxonomy of Catholicism, Orthodox Christianity, and Islam as hierarchical religions from La Porta et al. (1997)’s study.

Besides the differences between religious sects in terms of their values and belief systems, the degree of dominance of a religion in a society can be a determining factor of the level of corruption. People who belong to the same religion have shared cultural values with regard to positive and negative attitudes. For instance, while Protestants believe that avoiding committing a sin is the responsibility of people, Catholicism is more tolerant of errors and sins (Lipset and Lenz 2000). Hence, it is plausible to expect that societies in which religions emphasizing the weaknesses of human beings are dominant experience corruption more than the societies where the dominant religion is not tolerant of making mistakes.

We can therefore derive four testable hypotheses with respect to the effect of religion on corruption that we test in our empirical analysis:

H₁: Religion matters for attitudes toward corruption.

H₂: Religiosity matters for attitudes toward corruption.

H₃: Hierarchical religions are associated with greater tolerance of corruption than individualistic religions.

H₄: Religion affects attitudes toward corruption depending on whether it is a majority or minority religion in a country.

Related Literature

There is a large strand of empirical literature devoted to corruption. Some works document the effects of corruption,² others seek for the determinants of corruption.³ The relation between religion and corruption has, however, only been questioned in a few studies with most of them providing country-level investigation. We stress that all these works concentrate on actual and perceived levels of corruption, which constitutes a major difference with our work focusing on attitudes toward corruption.

One of the first studies that examine the relationship between corruption and religion is La Porta et al. (1997). While the focus of the paper is the impact of trust on the performance of large organizations, La Porta et al. also investigate the forces that help the formation of trust and state that hierarchical religions may be a factor that leads to distrust, and hence affects the performance of large organizations. They define Catholicism, Eastern Orthodoxy, and Islam as hierarchical religions and use the percentage of population adhering to these religions as the variable representing the hierarchical religions in their regressions. They find that countries with dominant hierarchical religions experience greater corruption.

In their investigation of the determinants of government performance, La Porta et al. (1999) find that countries whose dominant religion is Catholicism

²See Mauro (1995), Aidt, Dutta, and Sena (2008), Méon and Weill (2010), and Cieslik and Goczek (2018) for the effects of corruption on investment, growth, and productivity. See Alesina and Weder (1999), Wei (2000), and Bellos and Subasat (2012) for the effects of corruption on foreign direct investment. See Mauro (1998) and Liu and Mikesell (2019) for the effects of corruption on government expenditures, revenues, and the quality of public institutions.

³See Fisman and Gatti (2002), Brunetti and Weder (2003), Dreher, Kotsogiannis, and McCorriston (2007), Mocan (2008), Torgler and Valev (2010), Iwasaki and Suzuki (2012), and Jetter and Parmeter (2018).

or Islam have worse governments than the countries whose dominant religion is Protestantism.

Treisman (2000) investigates the determinants of corruption by drawing on the country indices of perceived corruption from Transparency International for the years 1996, 1997, and 1998. As a robustness check, he also uses the perceived corruption index of Business International for the early years of 1980s. By taking into account the percentage of Protestants in 1980 in the countries under investigation, together with other institutional⁴ and economic⁵ explanatory variables, Treisman (2000) argues that Protestant traditions are linked to lower corruption. According to the author, this result stems from the positive influence of Protestantism on economic development (the Weber argument) and stable democracy along with the higher toleration of different opinions or a higher commitment to ethics in Protestant societies. Treisman (2000) also puts forward that this finding may be related to the fact that Protestantism generally arose as an opposing institution to the state, and hence the Protestant Church may serve as a monitoring mechanism of the state officials.

Sandholtz and Koetzle (2000) examine the relationship between corruption and religion by offering a theoretical framework that puts forward that the level of corruption is determined by political-economic structures of incentives and cultural norms. The authors use the 1996 corruption index from Transparency International to measure corruption and take into account several explanatory variables, such as GDP per capita, economic freedom, democracy, democratic years, and trade. With regard to religion, they reach a conclusion similar to Treisman's (2000) study and suggest that the level of corruption is lower in predominantly Protestant countries.

Paldam (2001) seeks the influence of culture on corruption by drawing on a data set that covers 100 countries for the year 1999. The author states that culture is a vague concept that is not easily quantified. However, he argues that religion can be used as a proxy since it is one of the main elements of culture. In the empirical analysis, Paldam (2001) takes into account 11 religious denominations (Old Christianity, Catholicism, Protestantism, Anglicanism, Islam, Hinduism, Buddhism, Oriental Religions, Tribal Religions, Atheists, and Others) and the calculations of the Herfindahl Index, which represents religious diversity. At the end of the empirical estimations, Paldam (2001) concludes that Reform Christianity (which covers Protestantism and Anglicanism) and Tribal Religions reduce the level of corruption, while Pre-Reform Christianity (which covers Old Christianity, Catholicism, and Orthodoxy) increases it. Furthermore, Paldam (2001) suggests that Pre-Reform Christians and Muslims are equally corrupt and Islam can be added to the Pre-Reform Christianity in terms of its effect on corruption.

Beets (2007) analyzes the impact of religion on corruption by using the non-parametric statistical measure of Kruskal-Wallis for 133 countries. In the empirical analysis, Beets (2007) draws on the Corruption Perceptions Index of Transparency International for the year 2003, the dominant religion practiced in each country, the importance of religion to the citizens, religious freedom, and

⁴Treisman's institutional variables consider common law or civil law systems, legal system and colonial experience, democracy, political instability, state intervention, ethno-linguistic fractionalization, and political system.

⁵Treisman's economic variables include GDP per capita, trade liberalization, and large endowments of valuable natural resources.

GDP per capita. The results of this study indicate that the level of corruption is low in countries whose citizens are well off, have more freedom in terms of religion, and do not think that religion is an important part of their life. In contrast, countries whose citizens are poorer, have comparatively less religious freedom, and think that religion is an important part of their life are confronted with high levels of corruption. Beets (2007) suggests that countries where the dominant religion is Christianity incline to be in the first group while overwhelmingly Muslim countries incline to be in the second group.

Gokcekus (2008) investigates whether religious tradition whose influence emanates from 100 years ago or present and religious composition affects the level of corruption by utilizing the 2003 Corruption Perceptions Index of Transparency International and the percentages of Protestants in 1900, 1970, 1990, and 2000. He finds that the percentage of Protestants has a negative and significant impact on corruption with greater coefficient in absolute value for the percentage of Protestants in 1900 and 1970 than for the impact in 2000. In the additional estimations, he concludes that the percentage of Protestants in 1900 is a better explanatory variable of corruption than the percentage of Protestants in 2000.

In a related vein, North, Orman, and Gwin (2013) investigate the effects of the country's dominant religious culture on corruption and rule of law in 203 countries with governance indicators from the World Bank for 2004. They find that corruption is lowest in countries where the dominant religion was Protestantism in 1900, and is highest in countries where the dominant religion was Orthodox Christianity in 1900. They conclude that the effect of religion on corruption becomes evident only over centuries instead of years.

Dincer (2008) analyzes how ethnic and religious diversity affect the level of corruption in 48 U.S. states over the period 1980–1989 and 1990–1999. The author measures the level of corruption by calculating 10-year averages of the number of government officials per 100,000 people convicted in a state for crimes and uses fractionalization and polarization indexes for ethnic and religious diversity. The empirical results of this study show that while religious polarization has a linear and positive impact on corruption, the relationship between religious fractionalization and corruption is inverse-U shaped. Hence, religious fractionalization has a positive impact on corruption until reaching an inflection point and after this point the relationship between religious fractionalization and corruption turns out to be negative.

Unlike the other studies, Sommer, Bloom, and Arikan (2013) seek the impact of religion on corruption by using religious regulation and religious discrimination against minorities as variables representing religion. The main argument of this study is that the effect of religion on corruption is contingent upon the institutional framework. They find that while religious freedom has a decreasing effect on corruption in a democratic environment, it is unlikely to reduce corruption in a non-democratic environment. Hence, the authors conclude that religion may be an important factor in the fight against corruption only with adequate institutional framework.

Mensah (2014) examines the effects of religion and culture on the levels of perceived corruption in 187 countries over the period 2000–2010. In the empirical analysis, the author uses the cultural clusters from House et al. (2004) in

order to identify cultural dimensions in the world. By categorizing 187 countries into 12 cultural clusters and by drawing on 3 different corruption measures, Mensah (2014) asserts that cultural and religious elements are significant determinants of corruption together with political institutions and structures. Furthermore, unlike previous studies, the results of this analysis also suggest that not only Protestantism, but also Buddhism and to a limited extent Hinduism, have a preventive impact on the level of perceived corruption. However, non-Protestant Christianity and Islam have much lesser preventive impact on corruption in comparison to Protestantism, Buddhism, and Hinduism. According to these findings, Mensah (2014) concludes that earlier results related to Protestantism mainly emanate from the failure to categorize the religions adequately.

In summary, most of the empirical studies in the existing literature focus on the macro-level effects of religion on corruption and do not take into account the differences across individuals with regard to religion and devotion. However, there might be significant dissimilarities even among the individuals who adhere to the same religion in terms of religious commitment, interpretation of the religion's teachings, and the attitudes toward ethical issues.

DATA AND METHODOLOGY

In our empirical analysis, we use World Values Survey (WVS) Wave 6 covering 2010–2014. The WVS comprises nationally representative surveys that investigate beliefs and values. Wave 6 of the survey includes data obtained from interviews with more than 85,000 respondents in 59 countries. Our selection of countries is therefore based on the availability of data in this survey. The sample includes countries with different dominant religions, heterogeneous levels of corruption, and countries from various levels of economic development all around the world. It is therefore fully satisfactory to investigate the link between religion and corruption.

We aim to explain attitudes toward corruption, and consequently we use the question from the WVS that asks the respondents to what extent the statement of “Someone accepting a bribe in the course of their duties” is justifiable. The answer to this question is a categorical variable on a 10-point scale with higher values representing more justifiability to corruption, which we use to create the variable *Bribe*.

For religious denomination, there are 98 different religious groups in the WVS. Since most options drew very few responses, we decide to focus on the major world religions in line with former papers on the influence of religion. We therefore consider the following religious denominations: Atheism, Buddhism, Protestantism, Hinduism, Judaism, Islam, Orthodox Christianity, and Catholicism. All other religions are included in a heterogeneous category entitled *Other Religion*, which covers the Others category in the questionnaire together with the religious groups that we do not take into account as a separate category in our models.

We then create seven dummy variables equal to 1 if the respondent declares that he or she belongs to one of the associated religious denominations and 0 otherwise: *Catholic*, *Protestant*, *Orthodox*, *Jew*, *Muslim*, *Hindu*, *Buddhist*, *Other Religion*, and *Atheist*. *Atheist* is used as the omitted variable.

For religiosity, we consider two variables. First, we use the frequency of

attendance to the religious services (*Attendance*). It is based on the response on a scale from 1 to 7 to the statement: “Apart from weddings and funerals, about how often do you attend religious services these days?” Second, we consider the frequency of prayer (*Pray*) of the respondents. It is based on the response on a scale from 1 to 7 to the statement: “Apart from weddings and funerals, about how often do you pray?” In the WVS, higher values of these variables represent lower frequency of religious attendance and prayer. For interpretation purposes, we reversed these variables in our models so that higher values of *Attendance* and *Pray* indicate higher frequency of religious attendance and prayer, hence greater religiosity.

To isolate the effect of religion from other effects, we control for country-fixed effects and an assortment of individual characteristics. *Gender* is a dummy variable that equals 1 if the respondent is male. *Age* is the number of years that the respondents have lived. *Education Level* is a 9-point scale variable that takes values from 1 to 9 with higher values indicating more education. *Income Level* is a 10-point scale variable on which 1 represents the lowest income group and 10 represents the highest income group in the country where the respondents live. *State of Health* is a dummy variable that takes the values from 1 to 4 with higher values showing a worse state of health. We reversed this variable so that higher values indicate a better state of health for our interpretation purposes. *Marital Status* is a dummy variable that takes the value of 1 if the respondent is married and 0 otherwise. *Having Children* is a dummy variable that takes the value of 1 if the respondent has a child or children and 0 otherwise. We also take into account the frequency of using TV news to obtain information and the frequency of using the internet to obtain information, in line with evidence that mass media can influence the perception of corruption (Besley and Prat 2006; Enikolopov, Petrova, and Sonin 2016). Both *TV News* and *Internet* are 5-point scale variables with higher values indicating less frequent use of TV and internet in order to obtain information. Similar to religiosity and state of health variables, we reversed the values of *TV News* and *Internet* so that higher values represent more frequent use of TV and internet in order to obtain information. Table 1 displays the descriptive statistics for all variables used in the estimations.

The tested equation is as follows:

$$\text{Bribe}_i = \alpha + \beta \text{ Religion Variables}_i + \delta \text{ Controls}_i + \epsilon_i \quad (1)$$

Where *Religion Variables* is a set of variables for religion and religiosity that differs across estimations. Namely, we first estimate our model by using only one of the religion/religiosity variables (religious denomination, *Attendance*, or *Pray*) together with the control variables. Then, we estimate the model once again by taking into account the interaction between religious denomination and religious attendance/prayer. After these estimations, we separately estimate the model for the countries in which the dominant religion is Roman Catholicism, Orthodox Christianity, Protestantism, and Islam. Lastly, we estimate our model for multi-religious countries in our data set. These countries are Germany, Lebanon, Malaysia, and Nigeria.

TABLE 1. Descriptive Statistics

Variables	Mean	Standard Deviation	Minimum	Maximum	Observations
Bribe	1.9700	1.9026	1	10	68,934
Religious Denomination					
Other	0.0829	0.2758	0	1	68,934
Atheist	0.1865	0.3895	0	1	68,934
Buddhist	0.0479	0.2136	0	1	68,934
Protestant	0.0968	0.2957	0	1	68,934
Hindu	0.0238	0.1525	0	1	68,934
Jew	0.0054	0.0731	0	1	68,934
Muslim	0.2719	0.4449	0	1	68,934
Orthodox	0.0976	0.2967	0	1	68,934
Catholic	0.1872	0.3901	0	1	68,934
Attendance	3.9640	2.1812	1	7	68,934
Pray	5.3263	2.6800	1	8	68,934
Gender	0.4762	0.4994	0	1	68,934
Age	41.96	16.53	16	98	68,934
Education	5.7857	2.3356	1	9	68,934
Income	4.9109	2.0936	1	10	68,934
Health	2.0789	0.8445	1	4	68,934
TV News	1.4531	0.9905	1	5	68,934
Internet	3.2370	1.7818	1	5	68,934
Marital Status	0.5533	0.4972	0	1	68,934
Children	0.7028	0.4570	0	1	68,934

Since our dependent variable is a categorical variable on a 10-point scale, we use an ordered probit estimator for our estimations. As a robustness check, we also estimate our main regressions by employing probit and OLS estimators.

RESULTS

Our investigation of the relation between religion and corruption takes place in three steps. We first display the main estimations. We then continue with results by groups of countries based on the majority religion. We complete the analysis with estimations on multi-religious countries and conclude with robustness tests.

Main Estimations

Table 2 reports the main estimations on the relation between religion and corruption. We consider five specifications based on alternative combinations of religion variables to control for the sensitivity of our results on the relation between religion and corruption. Column 1 considers religious denominations. Columns 2 and 3 alternatively include one religiosity measure, *Pray* or *Attendance*. Columns 4 and 5 analyze the simultaneous inclusion of one religiosity measure (*Pray* or *Attendance*) and religious denomination variables.

TABLE 2. Main Estimations

Ordered probit model estimations. The dependent variable is the ordinal variable *Bribe*. *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parentheses. All regressions are estimated by robust standard errors. Country fixed effects are included. Definitions of all variables used are presented in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Other	−0.1449*** (0.0234)			−0.0813*** (0.0242)	−0.1238*** (0.0243)
Buddhist	−0.0295 (0.0309)			0.0128 (0.0312)	−0.0182 (0.0311)
Protestant	−0.1017*** (0.0214)			−0.0332 (0.0224)	−0.0790*** (0.0224)
Hindu	−0.1172** (0.0460)			−0.0534 (0.0463)	−0.0985** (0.0461)
Jew	0.0377 (0.0714)			0.0802 (0.0717)	0.0512 (0.0715)
Muslim	−0.0347 (0.0250)			0.0337 (0.0259)	−0.0165 (0.0256)
Orthodox	−0.0367 (0.0254)			0.0242 (0.0260)	−0.0187 (0.0260)
Catholic	0.0011 (0.0182)			0.0606*** (0.0191)	0.0204 (0.0192)
Pray		−0.0276*** (0.0023)		−0.0277*** (0.0025)	
Attendance			−0.0126*** (0.0026)		−0.0095*** (0.0028)
Gender	0.0819*** (0.0098)	0.0725*** (0.0098)	0.0851*** (0.0097)	0.0720*** (0.0098)	0.0826*** (0.0098)
Age	−0.0072*** (0.0004)	−0.0068*** (0.0004)	−0.0071*** (0.0004)	−0.0068*** (0.0004)	−0.0071*** (0.0004)
Education	−0.0295*** (0.0026)	−0.0290*** (0.0026)	−0.0295*** (0.0026)	−0.0289*** (0.0026)	−0.0294*** (0.0026)
Income	0.0406*** (0.0027)	0.0406*** (0.0027)	0.0409*** (0.0027)	0.0403*** (0.0027)	0.0406*** (0.0027)
Health	0.0530*** (0.0065)	0.0525*** (0.0065)	0.0524*** (0.0065)	0.0526*** (0.0065)	0.0525*** (0.0065)
TV News	0.0647*** (0.0049)	0.0624*** (0.0049)	0.0642*** (0.0049)	0.0627*** (0.0049)	0.0641*** (0.0049)
Internet	−0.0195*** (0.0035)	−0.0195*** (0.0035)	−0.0199*** (0.0035)	−0.0194*** (0.0035)	−0.0196*** (0.0035)
Marital Status	−0.0816*** (0.0123)	−0.0801*** (0.0123)	−0.0809*** (0.0123)	−0.0802*** (0.0123)	−0.0804*** (0.0123)
Children	0.0291** (0.0141)	0.0322** (0.0141)	0.0297** (0.0141)	0.0317** (0.0141)	0.0294** (0.0141)
Observations	68,934	68,934	68,934	68,934	68,934
Pseudo R-squared	0.0627	0.0632	0.0625	0.0635	0.0628

Overall, our evidence supports the notion that religion influences tolerance of corruption with two main findings. Our first finding is that religiosity reduces tolerance of corruption. We observe a negative and significant coefficient for *Pray* and *Attendance* in all estimations. In other words, religious people tend to be more averse to corruption in line with the expectation that religion fosters honest behavior and encourages people to obey the rules.

Our second finding concerns the impact of religious denominations on attitudes toward corruption. Recalling that the *Atheist* denomination is the omitted category, we detect a negative coefficient for *Protestant* and for *Hindu*. These coefficients are significant in two specifications (only religious denomination variables, and with *Attendance*) and not significant in one specification (with *Pray*). In addition, we observe a positive coefficient for *Catholic*, but it is only significant when *Pray* is included in the specification. In contrast, the coefficients for *Buddhist*, *Jew*, *Muslim*, and *Orthodox* are never significant. We can therefore extract two main conclusions from these results. On the one hand, Protestants and Hindus tend to be more averse to corruption than atheists. On the other hand, the other religious affiliations do not seem to be associated with higher or lower tolerance of corruption than atheism.

These results correspond roughly with our predictions. We find results in line with the view that religiosity encourages standards for behavior, and as such encourages good social behavior. We find support to the view that individualistic religions are associated with lower tolerance of corruption than hierarchical religions (Catholicism, Orthodox Christianity, and Islam), with both religions associated with greater aversion of corruption being individualistic religions.

Our findings overall accord with what has been found at the country level in studies explaining the perceived corruption. The finding of lower tolerance of corruption for Protestants is in line with the common observation that Protestantism is associated with lower perception of corruption (La Porta et al. 1999; Treisman 2000; Paldam 2001). The absence of significant difference for tolerance of corruption between Catholicism and Islam is in accordance with former works, for example, Paldam (2001). Finally, the finding that Hinduism is associated with a higher aversion to corruption has also been observed by Mensah (2014).

Regarding control variables, we observe consistent and significant results across all five specifications. Women, married, older, and more educated individuals have more negative attitudes toward corruption. In contrast, greater income, better health, and having children are associated with more tolerance of corruption. Interestingly, higher frequency of using TV news is positively related to tolerance of corruption, while higher frequency of using the internet is negatively related.

A natural question that emerges concerns the influence of religiosity on how religious denominations are associated with corruption. Namely, we can wonder if, for instance, Protestants who are not religious have the same aversion toward corruption as religious Protestants.

To this end, we perform additional estimations by including interaction terms between religiosity and religious affiliation variables. Table 3 displays these estimations. The first column considers interaction terms for religious denominations with *Pray*, while the second column includes those with *Attendance*.

TABLE 3. Main Estimations with Interaction Terms

Ordered probit model estimations. The dependent variable is the ordinal variable *Bribe*. *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parentheses. All regressions are estimated by robust standard errors. Country fixed effects are included. Definitions of all variables used are presented in the Appendix.

	(1)	(2)
Religiosity Measure	Pray	Attendance
Other	0.0968*	0.1417***
	(0.0498)	(0.0488)
Buddhist	0.0915	0.1820***
	(0.0581)	(0.0564)
Protestant	0.0840	0.0379
	(0.0576)	(0.0526)
Hindu	0.2969***	0.1230
	(0.0910)	(0.0832)
Jew	0.0269	0.1107
	(0.1594)	(0.1392)
Muslim	0.2144***	0.0448
	(0.0394)	(0.0370)
Orthodox	0.1301***	0.0500
	(0.0429)	(0.0473)
Catholic	0.1426***	0.0899**
	(0.0412)	(0.0387)
Pray	0.0050	
	(0.0050)	
Attendance		0.0280***
		(0.0071)
Other × Religiosity	−0.0457***	−0.0763***
	(0.0086)	(0.0109)
Buddhist × Religiosity	−0.0304***	−0.0696***
	(0.0109)	(0.0141)
Protestant × Religiosity	−0.0356***	−0.0447***
	(0.0093)	(0.0110)
Hindu × Religiosity	−0.0739***	−0.0693***
	(0.0141)	(0.0174)

	(1)	(2)
Religiosity Measure	Pray	Attendance
Jew × Religiosity	−0.0019	−0.0315
	(0.0307)	(0.0367)
Muslim × Religiosity	−0.0461***	−0.0335***
	(0.0066)	(0.0084)
Orthodox × Religiosity	−0.0358***	−0.0360***
	(0.0083)	(0.0117)
Catholic × Religiosity	−0.0293***	−0.0355***
	(0.0074)	(0.0093)
Gender	0.0741***	0.0817***
	(0.0098)	(0.0099)
Age	−0.0068***	−0.0072***
	(0.0004)	(0.0004)
Education	−0.0285***	−0.0291***
	(0.0026)	(0.0026)
Income	0.0400***	0.0403***
	(0.0027)	(0.0027)
Health	0.0527***	0.0520***
	(0.0065)	(0.0065)
TV News	0.0628***	0.0643***
	(0.0049)	(0.0049)
Internet	−0.0194***	−0.0192***
	(0.0035)	(0.0035)
Marital Status	−0.0794***	−0.0796***
	(0.0123)	(0.0123)
Children	0.0320**	0.0293**
	(0.0141)	(0.0141)
Observations	68,934	68,934
Pseudo R-squared	0.0639	0.0631

The main result is the significantly negative coefficient of all interaction terms between religious denominations and both religiosity variables, with one exception. Therefore, our main conclusion is that religiosity reduces tolerance of corruption, whatever the religion type. It consequently corroborates our conclusion that religiosity is associated with higher aversion to corruption. The only exception is for Judaism, for which interaction terms are negative but not significant, which can result from the fact that it is the religion with the lowest number of observations in the sample.

The analysis of the coefficients for religious denomination variables provides interesting findings. We observe that *Catholic* is significantly positive in

both estimations. It therefore suggests that Catholics have a greater tolerance of corruption than atheists. However, this greater tolerance diminishes with the intensity of religiosity of Catholics. The same conclusion stands to a lesser degree for Hinduism, Islam, Orthodox Church, and Buddhism, with significant and positive coefficients in one of both estimations. At the same time, we observe no significant coefficient for *Protestant* variable. Therefore, these results complement our findings on the effect of religious denominations on attitudes toward corruption.

Our main estimations have shown the average effect of religious denominations without considering how religiosity can influence it. The additional estimations with interactions between religious denominations and religiosity therefore show that the conclusions on religious denominations need to be qualified by religiosity for most religion types.

Estimations by Dominant Religion

The main estimations have shown the effect of religious denominations on attitudes toward corruption. However, whether a religion dominates or is only practiced by a minority can exert an impact on how religion shapes social behavior. We then redo our estimations by distinguishing groups of countries based on the dominant religion.

We define a country as belonging to one group if at least 50% of the respondents in a country state that they have this religious denomination. Only two countries in our sample can then be considered as Protestant countries (Ghana and Zimbabwe). The lack of representativeness of both countries coming from the same continent and the small number of countries leads us not to consider Protestant countries. We thus consider three groups of countries: Catholic, Orthodox, and Muslim countries. Catholic countries are Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, the Philippines, Poland, Rwanda, and Slovenia.⁶ Orthodox countries are Belarus, Cyprus, Romania, Russia, and Ukraine.⁷ Muslim countries are Algeria, Azerbaijan, Iraq, Jordan, Kazakhstan, Kyrgyz Republic, Lebanon, Libya, Malaysia, Morocco, Pakistan, Tunisia, Turkey, and Uzbekistan.⁸

Tables 4 through 6 report the results for each dominant religion. Do we observe the same results for religious denominations whatever their majority or minority status? The answer is negative for Catholicism and Orthodox Church, but positive for Islam.

Catholics do not have the same attitude toward corruption if they represent the majority or the minority of the population. When Catholicism is the dominant religion, Catholics have more tolerance toward corruption than atheists, as observed in Table 4. However, in Muslim countries, Catholics have greater

⁶The percentage of Roman Catholics in the total respondents is as follows: Argentina (70.16), Brazil (53.11), Chile (64.90), Colombia (61.51), Ecuador (62.70), Mexico (69.69), Peru (74.50), the Philippines (69.12), Poland (94.19), Rwanda (55.73), and Slovenia (65.44).

⁷The percentage of Orthodox Christians in the total respondents is as follows: Belarus (73.33), Cyprus (67.50), Romania (85.46), Russia (62.56), and Ukraine (73.20).

⁸The percentage of Muslims in the total respondents is as follows: Algeria (99.50), Azerbaijan (97.01), Iraq (99.00), Jordan (97.00), Kazakhstan (50.30), Kyrgyz Republic (89.42), Lebanon (55.09), Libya (98.23), Malaysia (63.08), Morocco (99.25), Pakistan (99.67), Tunisia (100.00), Turkey (99.13), and Uzbekistan (95.70).

TABLE 4. Catholic Countries

Ordered probit model estimations. The dependent variable is the ordinal variable *Bribe*. *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parentheses. All regressions are estimated by robust standard errors. Country fixed effects are included. Definitions of all variables used are presented in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Other	−0.1647*** (0.0552)			−0.1203** (0.0570)	−0.1577*** (0.0584)
Buddhist	−0.5133 (0.5283)			−0.4766 (0.5317)	−0.5048 (0.5289)
Protestant	0.0175 (0.0443)			0.0622 (0.0465)	0.0243 (0.0476)
Hindu	−0.1434 (0.4177)			−0.1265 (0.4208)	−0.1398 (0.4182)
Jew	0.2802 (0.4240)			0.2769 (0.4225)	0.2837 (0.4241)
Muslim	0.0526 (0.0865)			0.0967 (0.0875)	0.0585 (0.0875)
Orthodox	0.3006** (0.1274)			0.3513*** (0.1279)	0.3067** (0.1284)
Catholic	0.0510* (0.0306)			0.0848*** (0.0324)	0.0559* (0.0334)
Pray		−0.0169*** (0.0054)		−0.0198*** (0.0058)	
Attendance			−0.0026 (0.0059)		−0.0026 (0.0066)
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	13,147	13,147	13,147	13,147	13,147
Pseudo R-squared	0.0621	0.0615	0.0613	0.0624	0.0621

aversion to corruption than atheists, as shown in Table 6, while in Orthodox countries, the relation between being Catholic and attitudes toward corruption is not significant, as pointed out in Table 5.

Orthodox persons tend to have higher aversion to corruption than atheists when they are the majority. We find a negative coefficient for *Orthodox* in Table 5 for estimations with Orthodox Christianity as dominant (not always significant). But they have more tolerance of corruption than atheists in Catholic countries, while the relation between being Orthodox and attitudes toward corruption is not significant in Muslim countries.

For Islam (Table 6), the results do not change when this religion is majority or minority. In all tables, we observe no significant coefficient for *Muslim* in line with our previous finding that Muslims do not have significantly different attitudes toward corruption than atheists.

Thus, these results are particularly interesting to appraise the relation between hierarchical Christian religions and tolerance of corruption. They show

TABLE 5. Orthodox Christian Countries

Ordered probit model estimations. The dependent variable is the ordinal variable *Bribe*. *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parentheses. All regressions are estimated by robust standard errors. Country fixed effects are included. Definitions of all variables used are presented in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Other	−0.2686** (0.1335)			−0.2166 (0.1348)	−0.2764** (0.1347)
Buddhist	0.4247 (0.4659)			0.4572 (0.4704)	0.4195 (0.4631)
Protestant	−0.0372 (0.1259)			0.0125 (0.1272)	−0.0461 (0.1280)
Hindu	0.1524 (0.6101)			0.1702 (0.5878)	0.1548 (0.6088)
Jew	−0.1003 (0.3027)			−0.0247 (0.3077)	−0.1072 (0.3018)
Muslim	0.1009 (0.0766)			0.1302 (0.0781)	0.0971 (0.0771)
Orthodox	−0.0901 (0.0427)			−0.0482 (0.0457)	−0.0968** (0.0460)
Catholic	−0.0880 (0.0819)			−0.0298 (0.0853)	−0.0976 (0.0861)
Pray		−0.0216*** (0.0067)		−0.0183 (0.0072)	
Attendance			−0.0060 (0.0093)		0.0038 (0.0101)
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	7,317	7,317	7,317	7,317	7,317
Pseudo R-squared	0.0478	0.0474	0.0469	0.0481	0.0478

that this relation is influenced by the status of dominant religion. Interestingly, Catholics can be more tolerant toward corruption than atheists when they represent the majority, and more averse when they are the minority, while the opposing view is observed for Orthodox. In other words, the status of minority religion would favor a greater or lower leniency toward corruption for individuals belonging to both these hierarchical Christian religions, but in opposing directions.

Multi-Religious Countries

We prolong the in-depth investigation on the relation between religious denominations and corruption by considering specific countries in greater detail. WVS includes four countries that are characterized by a multi-confessional environment in the sense that they are not dominated by one religion, but rather see a coexistence of significant religious groups. These countries therefore provide relevant frameworks to analyze the influence of religious affiliations on attitudes

TABLE 6. Muslim Countries

Ordered probit model estimations. The dependent variable is the ordinal variable *Bribe*. *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parentheses. All regressions are estimated by robust standard errors. Country fixed effects are included. Definitions of all variables used are presented in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Other	−0.3423*** (0.1078)			−0.2940*** (0.1085)	−0.3392*** (0.1080)
Buddhist	−0.1841* (0.1086)			−0.1690 (0.1090)	−0.1834* (0.1086)
Protestant	0.1541 (0.1897)			0.2338 (0.1866)	0.1596 (0.1899)
Hindu	0.2542* (0.1307)			0.3181** (0.1317)	0.2574* (0.1308)
Jew	0.9844*** (0.2055)			1.0656*** (0.2158)	0.9862*** (0.2055)
Muslim	0.0057 (0.0691)			0.0842 (0.0701)	0.0095 (0.0695)
Orthodox	−0.0787 (0.0780)			−0.0151 (0.0789)	−0.0746 (0.0785)
Catholic	−0.2082** (0.0990)			−0.1396 (0.0999)	−0.2036** (0.0994)
Pray		−0.0373*** (0.0046)		−0.0399*** (0.0046)	
Attendance			−0.0025 (0.0050)		−0.0026 (0.0050)
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	17,411	17,411	17,411	17,411	17,411
Pseudo R-squared	0.0413	0.0415	0.0397	0.0434	0.0413

toward corruption since they allow comparing religions in the same institutional framework.

We do not claim that the results in these countries can be generalized to all countries. The key idea of our investigation is to provide additional investigation to check if our previous findings on the effect of religious denominations on corruption even stand for these multi-religious countries. These four countries are Germany, Malaysia, Lebanon, and Nigeria.

Germany is historically a European country in which neither Catholics nor Protestants represent the overwhelming majority. In comparison with predominantly Catholic Southern European countries or mostly Protestant Northern European countries, Germany is therefore a country of prime interest to compare the behavior of Catholics and Protestants.

Table 7 reports the estimations for Germany. Interestingly, we find evidence of a negative coefficient for both *Catholic* and *Protestant*, which is significant in some estimations. Hence, the result of lower tolerance of corruption for

TABLE 7. Germany

Ordered probit model estimations. The dependent variable is the ordinal variable *Bribe*. *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parentheses. All regressions are estimated by robust standard errors. Definitions of all variables used are presented in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Other	−0.2819 (0.3569)			−0.2397 (0.3614)	−0.3871 (0.3526)
Buddhist	−3.8652*** (0.1908)			−3.8704*** (0.1899)	−4.0368*** (0.1903)
Protestant	−0.0895 (0.0720)			−0.0667 (0.0823)	−0.1507* (0.0827)
Hindu	−0.1803 (0.3867)			−0.1763 (0.3849)	−0.1999 (0.3900)
Jew	0.9804 (0.7095)			0.9842 (0.7097)	0.9674 (0.7099)
Muslim	−0.5068** (0.2225)			−0.4601* (0.2402)	−0.6353*** (0.2442)
Orthodox	0.9353*** (0.2303)			0.9699*** (0.2361)	0.8497*** (0.2373)
Catholic	−0.1578** (0.0801)			−0.1228 (0.0990)	−0.2436** (0.0965)
Pray		−0.0267* (0.0139)		−0.0119 (0.0187)	
Attendance			−0.0024 (0.0171)		0.0369 (0.0228)
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	1,882	1,882	1,882	1,882	1,882
Pseudo R-squared	0.0244	0.0182	0.0172	0.0245	0.0251

Protestants relative to atheists tends to be confirmed in Germany. At the same time, Germany shows no clear difference in behavior toward corruption between Protestants and Catholics.

Lebanon can be considered as a relevant country to compare the behavior of Christians and Muslims. It has a very religiously diverse society with, broadly speaking, half the population belonging to Islam and half the population affiliating with Christian religions. Each half is not at all homogenous, which creates the highest level of religious diversity in the Middle East. In our investigation, we concentrate on the main religions we examine, i.e., Islam, Orthodox, Catholicism, and Protestantism, which are represented in Lebanon.

Table 8 provides estimations for Lebanon. We observe significant and positive coefficients for all four religious denominations in all specifications. In other words, the different Christian religions and Islam are all associated with greater tolerance of corruption than atheists in Lebanon.

The Lebanese case gives us motives to qualify our main findings in the sense that they might not be universal. It is not in line with our former finding

TABLE 8. Lebanon

Ordered probit model estimations. The dependent variable is the ordinal variable *Bribe*. *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parentheses. All regressions are estimated by robust standard errors. Definitions of all variables used are presented in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Protestant	1.5804*** (0.2605)			1.5927*** (0.2650)	1.6352*** (0.2816)
Muslim	1.2559*** (0.1844)			1.2584*** (0.1848)	1.3045*** (0.1940)
Orthodox	1.2244*** (0.2081)			1.2288*** (0.2087)	1.2186*** (0.2154)
Catholic	0.9198*** (0.1951)			0.9237*** (0.1956)	0.9087*** (0.2023)
Pray		0.0137 (0.0183)		0.0179 (0.0187)	
Attendance			0.0786*** (0.0208)		0.0998*** (0.0224)
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	1,067	1,067	1,067	1,067	1,067
Pseudo R-squared	0.0361	0.0154	0.0195	0.0363	0.0426

of negative relation for Protestantism and no significant relation for the three hierarchical religions. However, Lebanon appears to be a specific country in our sample of countries with findings obtained in this country that differ from the results on the full sample. Even for religiosity, the results differ with the fact that *Pray* is positive but not significant, while *Attendance* is significantly positive, which means that greater frequency of attendance is associated with tolerance of corruption. In each respect, all religions and religiosity are associated with lower aversion to corruption in Lebanon.

Nigeria has similarities with Lebanon in the sense that the country is nearly equally divided between Islamic and Christian religions. However, each half is not as heterogeneous as in Lebanon. The majority of Nigerian Muslims are Sunni, while Christians are divided between a majority of Protestants and a minority of Catholics (approximately one quarter of Christians).

Table 9 reports the results for Nigeria. We observe no significant coefficient for *Protestant* and *Catholic*, while the coefficient for *Muslim* is significantly negative. Thus, in Nigeria, Islam is associated with a lower tolerance of corruption than atheism, while no significant relation is observed for both dominant Christian religions in the country. It therefore presents a different view than our cross-country estimations that conclude a negative relation for Protestantism, a non-significant one for Islam, yet a similar non-significant coefficient for Catholicism.

Malaysia is a multicultural country with a Muslim majority and significant Buddhist and Hindu minorities. As such, Malaysia is of particular interest to compare Islam, Hinduism, and Buddhism. Table 10 reports estimations for Malaysia. The coefficient of *Buddhist* is not significant, in line with the results

TABLE 9. Nigeria

Ordered probit model estimations. The dependent variable is the ordinal variable *Bribe*. *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parentheses. All regressions are estimated by robust standard errors. Definitions of all variables used are presented in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Other	−0.7617*			−0.7551*	−0.8329**
	(0.4423)			(0.4439)	(0.4008)
Protestant	−0.1130			−0.1136	−0.0650
	(0.0983)			(0.0985)	(0.0989)
Hindu	−0.9213*			−0.8985*	−1.0128**
	(0.4821)			(0.5029)	(0.4420)
Jew	−0.2573			−0.2572	−0.2210
	(0.2558)			(0.2556)	(0.2582)
Muslim	−0.3489***			−0.3512***	−0.3020**
	(0.1001)			(0.1013)	(0.1009)
Orthodox	−0.3405*			−0.3426*	−0.2676
	(0.1777)			(0.1781)	(0.1777)
Catholic	−0.0680			−0.0674	−0.0196
	(0.1030)			(0.1030)	(0.1036)
Pray		−0.0079		0.0056	
		(0.0269)		(0.0286)	
Attendance			−0.0813***		−0.0792***
			(0.0198)		(0.0202)
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	1,759	1,759	1,759	1,759	1,759
Pseudo R-squared	0.0158	0.0112	0.0142	0.0158	0.0186

on the full sample of countries. *Muslim* is positive but not significant in two of the three specifications. We therefore observe some limited support for the positive relation between Islam and tolerance of corruption, which differs from our conclusion on the full sample of countries. However, the main difference between Malaysia and the full sample of countries concerns Hinduism. While the coefficient for *Hindu* is significantly negative for all countries, it is significantly positive in Malaysia.

But all findings on Malaysia should also be considered by taking into account the majority or minority status of each religious denomination. Namely, Islam is the dominant religion, while Buddhism and especially Hinduism are practiced by minorities. Therefore, the observed results for Malaysia can be interpreted by this status.

All in all, the estimations on multi-religious countries show that the main conclusions on the relation between religious denominations and tolerance of corruption are not necessarily observed in such countries. They suggest moderating the view that universal findings could be observed for the impact of religious denominations on attitudes toward corruption. They therefore add to the estimations by majority group in this perspective.

TABLE 10. Malaysia

Ordered probit model estimations. The dependent variable is the ordinal variable *Bribe*. *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parenthesis. All regressions are estimated by robust standard errors. Definitions of all variables used are presented in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Other	0.4409 (0.2951)			0.4856 (0.3062)	0.5398* (0.3034)
Buddhist	0.2840 (0.2897)			0.3241 (0.3010)	0.3560 (0.2971)
Hindu	0.6945** (0.2998)			0.7609** (0.3164)	0.8161*** (0.3089)
Muslim	0.4453 (0.2849)			0.5199 (0.3043)	0.5804** (0.2948)
Pray		−0.0054 (0.0171)		−0.02191* (0.0192)	
Attendance			−0.0396** (0.0165)		−0.0538*** (0.0171)
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	1,298	1,298	1,298	1,298	1,298
Pseudo R-squared	0.0083	0.0054	0.0068	0.0087	0.0107

Robustness Checks

We perform robustness checks to test the sensitivity of our results. Since the main estimations have been performed with an ordered probit model, we redo the estimations in two ways.

First, we estimate a probit model. To this end, we recode the dependent variable for tolerance of corruption as a dummy variable equal to 1 if *Bribe* is from 6 to 10 and to 0 if *Bribe* is from 1 to 5. Table 11 displays the results. We observe the confirmation of our main findings. On the one hand, both religiosity variables are significantly negative in all estimations, supporting the conclusion that religious people have a lower tolerance of corruption. On the other hand, we find the same negative association between being Protestant or Hindu and tolerance of corruption: *Protestant* and *Hindu* are significantly negative in all specifications.

We observe one significantly positive coefficient for *Catholic* in one estimation, but it remains non-significant in two other estimations, in line with our findings with the ordered probit model. Now we see a negative relation between Buddhism and tolerance of corruption. While *Buddhist* was not significant in our main estimations, it is now significantly negative in all specifications. It therefore moderates our finding of no relation between Buddhism and tolerance of corruption. However, it strengthens our conclusion that individualistic religions have a more negative attitude toward corruption than hierarchical religions, in line with the view of Treisman (2000).

Second, we estimate an ordinary least squares (OLS) model. The variable for attitude to corruption is on a scale from 1 to 10, so an ordered probit model

TABLE 11. Robustness Checks with Probit

Probit model estimations. The dependent variable is the dummy variable equal to one if *Bribe* is from 6 to 10 (high values) and zero if *Bribe* is from 1 to 5 (low values). *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parentheses. Country fixed effects are included. All regressions are estimated by robust standard errors. Definitions of all variables used are presented in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Other	−0.1621*** (0.0362)			−0.1141*** (0.0376)	−0.1317*** (0.0379)
Buddhist	−0.1107** (0.0561)			−0.0797 (0.0565)	−0.0942* (0.0565)
Protestant	−0.1875*** (0.0376)			−0.1361*** (0.0391)	−0.1560*** (0.0393)
Hindu	−0.1868*** (0.0674)			−0.1396** (0.0681)	−0.1590** (0.0679)
Jew	0.1702 (0.1178)			0.2091* (0.1180)	0.1917 (0.1180)
Muslim	−0.0196 (0.0404)			0.0322 (0.0418)	0.0066 (0.0415)
Orthodox	−0.0412 (0.0440)			0.0045 (0.0451)	−0.0155 (0.0451)
Catholic	0.0073 (0.0299)			0.0518* (0.0314)	0.0342 (0.0316)
Pray		−0.0231*** (0.0038)		−0.0212*** (0.0041)	
Attendance			−0.0175*** (0.0043)		−0.0133*** (0.0047)
Gender	0.0801*** (0.0164)	0.0754*** (0.0164)	0.0843*** (0.0163)	0.0730*** (0.0164)	0.0804*** (0.0164)
Age	−0.0048*** (0.0007)	−0.0046*** (0.0007)	−0.0048*** (0.0007)	−0.0045*** (0.0007)	−0.0047*** (0.0007)
Education	−0.0289*** (0.0043)	−0.0288*** (0.0043)	−0.0291*** (0.0043)	−0.0285*** (0.0043)	−0.0288*** (0.0043)
Income	0.0495*** (0.0043)	0.0496*** (0.0043)	0.0500*** (0.0043)	0.0493*** (0.0043)	0.0496*** (0.0043)
Health	0.0358*** (0.0109)	0.0357*** (0.0109)	0.0351*** (0.0109)	0.0356*** (0.0109)	0.0352*** (0.0109)
TV News	0.0835*** (0.0076)	0.0819*** (0.0076)	0.0829*** (0.0075)	0.0820*** (0.0076)	0.0828*** (0.0076)
Internet	−0.0237*** (0.0056)	−0.0237*** (0.0056)	−0.0240*** (0.0056)	−0.0234*** (0.0056)	−0.0237*** (0.0056)
Marital Status	−0.0931*** (0.0206)	−0.0932*** (0.0206)	−0.0932*** (0.0206)	−0.0913*** (0.0206)	−0.0912*** (0.0206)
Children	0.0218 (0.0234)	0.0252 (0.0234)	0.0238 (0.0233)	0.0230 (0.0234)	0.0219 (0.0234)
Observations	68,934	68,934	68,934	68,934	68,934
Pseudo R-squared	0.1606	0.1599	0.1593	0.1614	0.1608

is more appropriate than a model considering a continuous variable. Nonetheless, several former studies like Guiso, Sapienza, and Zingales (2003) have performed OLS estimations with such a variable. Table 12 reports the estimations.

TABLE 12. Robustness Checks with OLS

OLS estimations. The dependent variable is the ordinal variable *Bribe*. *, **, *** denote an estimate significantly different from 0 at the 10%, 5%, or 1% level. Standard errors are in parentheses. All regressions are estimated by robust standard errors. Country fixed effects are included. Definitions of all variables used are presented in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Other	−0.2299*** (0.0366)			−0.1554*** (0.0378)	−0.2064*** (0.0377)
Buddhist	−0.0502 (0.0427)			−0.0024 (0.0431)	−0.0383 (0.0429)
Protestant	−0.1783*** (0.0301)			−0.1017*** (0.0316)	−0.1533*** (0.0317)
Hindu	−0.2711*** (0.0875)			−0.1992** (0.0879)	−0.2510*** (0.0874)
Jew	0.1136 (0.1083)			0.1583 (0.1087)	0.1281 (0.1084)
Muslim	−0.0352 (0.0413)			0.0403 (0.0423)	−0.0158 (0.0418)
Orthodox	−0.0568 (0.0362)			0.0135 (0.0373)	−0.0369 (0.0371)
Catholic	−0.0075 (0.0265)			0.0596** (0.0278)	0.0135 (0.0278)
Pray		−0.0322*** (0.0031)		−0.0302*** (0.0034)	
Attendance			−0.0162*** (0.0035)		−0.0101*** (0.0038)
Gender	0.1020*** (0.0137)	0.0925*** (0.0138)	0.1083*** (0.0136)	0.0908*** (0.0137)	0.1033*** (0.0137)
Age	−0.0075*** (0.0005)	−0.0071*** (0.0005)	−0.0075*** (0.0005)	−0.0071*** (0.0005)	−0.0075*** (0.0005)
Education	−0.0388*** (0.0036)	−0.0386*** (0.0036)	−0.0390*** (0.0036)	−0.0382*** (0.0036)	−0.0387*** (0.0036)
Income	0.0561*** (0.0039)	0.0561*** (0.0039)	0.0566*** (0.0039)	0.0556*** (0.0039)	0.0561*** (0.0039)
Health	0.0683*** (0.0093)	0.0682*** (0.0093)	0.0680*** (0.0093)	0.0678*** (0.0093)	0.0679*** (0.0093)
TV News	0.1046*** (0.0081)	0.1024*** (0.0081)	0.1042*** (0.0081)	0.1026*** (0.0081)	0.1040*** (0.0081)
Internet	−0.0281*** (0.0049)	−0.0278*** (0.0049)	−0.0284*** (0.0049)	−0.0278*** (0.0049)	−0.0282*** (0.0049)
Marital Status	−0.1180*** (0.0170)	−0.1176*** (0.0170)	−0.1182*** (0.0170)	−0.1166*** (0.0170)	−0.1167*** (0.0170)
Children	0.0309 (0.0203)	0.0353* (0.0203)	0.0323 (0.0203)	0.0341* (0.0203)	0.0313 (0.0203)
Observations	68,934	68,934	68,934	68,934	68,934
R-squared	0.1597	0.1598	0.1588	0.1607	0.1598

These additional regressions again confirm both our main findings. On the one hand, religiosity is negatively associated with tolerance of corruption. Coefficients for *Pray* and *Attendance* are significantly negative in all estimations. On the other hand, we again observe that Protestantism and Hinduism are associated with greater aversion toward corruption. For the rest, all coefficients for religious denominations are not significant in all estimations with one exception for *Catholic* in one specification.

CONCLUSION

This study has examined the relation between religion and tolerance toward corruption. We have performed a cross-country investigation with World Values Survey data to check if religiosity and religious denominations are associated with attitude toward corruption. We obtain two main findings.

First, religious people are more averse to corruption. This finding can be explained by the fact that religiosity favors honest behavior or at least good social behavior. In other words, to speak with Pope Francis's words, corruption seems to be considered evil by religious people.

Second, attitudes toward corruption differ across religious denominations. Protestantism and Hinduism are associated with lower tolerance of corruption than atheism, while other religions do not have clear differences. This conclusion accords with the view from Treisman (2000) that hierarchical religions (Catholicism, Orthodox Christianity, Islam) favor attitudes with respect for authority and thus diminish contestation of office-holders. As such, individualistic religions like Protestantism and Hinduism lead to lower tolerance of corruption.

However, the influence of religious denomination cannot be considered as universal. The behavior of individuals can be influenced by the fact that their religion is majority or minority. We observe that Catholics and Orthodox people do not have the same tolerance of corruption whether they live in a Catholic or an Orthodox country. We also find that the impact of religious denominations on attitude toward corruption varies with the religious environment through the comparison of results on four multi-religious countries. Taken together, these findings cast doubt on a general, global relation between religious denominations and attitudes toward corruption.

We therefore contribute to the identification of the determinants of corruption by showing that religiosity matters while religious denomination plays a role which can differ across countries. These findings also contribute to the literature on the influence of religion on economic outcomes by providing additional evidence that religion is not neutral. All in all, the main lesson from our investigation is that religion matters for institutions. As such, it cannot be ignored in the debate on the causes of economic development, even for the advocates of the key role of institutions.

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Appendix A: Definitions of Variables

DEPENDENT VARIABLE

Bribe Ordinal variable based on response to the question: *Please tell me for the following action whether you think it can always be justified, never be justified, or something in between: Someone accepting a bribe in the course of their duties.* Scoring from 1 (*never justifiable*) to 10 (*always justifiable*).

INDEPENDENT VARIABLES

Gender Dummy variable equal to 1 if the individual is a male and 0 otherwise.

Age The number of years that the respondents have lived.

Education Dummy variable based on a scale from 1 to 9 with higher values indicating more education (1: No formal education, 2: Incomplete primary school, 3: Complete primary school, 4: Incomplete secondary school: technical/vocational type, 5: Complete secondary school: technical/vocational type, 6: Incomplete secondary school: university-preparatory type, 7: Complete secondary school: university-preparatory type, 8: Some university-level education, without a degree, 9: University-level education, with degree). Variable based on the response to the statement: *What is the highest educational level that you have attained?*

Income Self-reported level of income of the respondent relative to his country. It is based on the question: *On this card is an income scale on which 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household is.* The figure reported ranges from 1 for lowest decile to 10 for highest income decile.

Health Dummy variable based on a scale from 1 to 4 with higher values representing worse state of health. Variable based on the response to the statement: *All in all, how would you describe your state of health these days? Would you say it is: 1: Very good, 2: Good, 3: Fair, 4: Poor.* We reversed this variable so that higher values indicate better state of health.

Television Dummy variable based on a scale from 1 to 5 with higher values indicating less frequent use of television to obtain information. Variable based on the response to the statement: *People learn what is going on in this country and the world from various sources. For television, please indicate whether you use it to obtain information daily, weekly, monthly, less than monthly, or never.* We reversed this variable so that higher values indicate more frequent use of television to obtain information.

Internet	Dummy variable based on a scale from 1 to 5 with higher values indicating less frequent use of the internet to obtain information. Variable based on the response to the statement: <i>People learn what is going on in this country and the world from various sources. For internet, please indicate whether you use it to obtain information daily, weekly, monthly, less than monthly, or never.</i> We reversed this variable so that higher values indicate more frequent use of internet to obtain information.
Catholic	Dummy variable equal to 1 if the individual declares he or she belongs to Catholic religion and 0 otherwise.
Protestant	Dummy variable equal to 1 if the individual declares he or she belongs to Protestant religion and 0 otherwise.
Orthodox	Dummy variable equal to 1 if the individual declares he or she belongs to Orthodox religion and 0 otherwise.
Muslim	Dummy variable equal to 1 if the individual declares he or she belongs to Catholic religion and 0 otherwise.
Jew	Dummy variable equal to 1 if the individual declares he or she belongs to Jewish religion and 0 otherwise.
Hindu	Dummy variable equal to 1 if the individual declares he or she belongs to Hindu religion and 0 otherwise.
Buddhist	Dummy variable equal to 1 if the individual declares he or she belongs to Buddhist religion and 0 otherwise.
No religion	Dummy variable equal to 1 if the individual declares he or she does not belong to any religion and 0 otherwise.
Other	Dummy variable equal to 1 for all the other religious denominations with a small number of respondents.
Pray	Dummy variable based on a scale from 1 to 7 with higher values representing lower frequency of prayer, specifically, 1: More than once a week, 2: Once a week, 3: Once a month, 4: Only on special holy days, 5: Once a year, 6: Less often, 7: Never, practically never.) Variable based on the response to the statement: <i>Apart from weddings and funerals, about how often do you pray?</i> We reversed this variable so that higher values indicate more frequent prayer.
Attendance	Dummy variable based on a scale from 1 to 7 with higher values representing lower frequency of religious attendance (1: More than once a week, 2: Once a week, 3: Once a month, 4: Only on special holy days, 5: Once a year, 6: Less often, 7: Never, practically never) Variable based on the response to the statement: <i>Apart from weddings and funerals, about how often do you attend religious services these days?</i> We reversed this variable so that higher values indicate more frequent religious attendance.

Organizational Forms and the Contracts of Bank Loans

Ibrahim Siraj

Abstract

Motivation: Prior literature focuses on one or two different types of organizational forms at a time to measure their impact on the cost of bank loans. However, without recognizing the effects of all major forms of organizations in empirical models, we cannot accurately figure out the most influential type of diversification affecting bank loan contracting. This paper is the first to consider all three important organizational forms, that is, industrial diversification, global diversification, and geographic dispersion, in an empirical framework to find out which types of diversification do matter in contracting bank loans.

Premise: In finding out the influence of organizational forms on bank loan contracting, I investigate three types of diversification: Industrial diversification that captures a firm's operations in different industries, global diversification that identifies if a firm has operations outside of the United States, and geographic dispersion that captures if a firm has subsidiaries located in different regions within the United States. Each type of diversification has its risk advantages and disadvantages, which to some extent overlap with each other. Thus, once these measures of diversification in a single model are included, the type of diversification that most influences bank loan contracting can be identified.

Approach: Using a sample of publicly listed U.S. companies with 16,704 loan-year observations from 1994 to 2009, this paper examines the pricing of bank loans and the non-price loan terms from the context of industrial diversification, global diversification, and geographic dispersion. The main empirical models of the paper use panel models and then employ the instrumental regression model in the robustness tests.

Results: I find that, on average, globally diversified firms could incur a 7.7 to 14.5 percent increase in loan pricing compared to the concentrated firms or the firms that are not diversified in any dimension. The other types of firms incurring a higher cost of bank debt are the firms that are only geographically dispersed and the firms that are diversified in all three forms. Examining the effects of organizational forms on the non-price loan terms, I observe that covenant restrictions are generally higher for the geographically dispersed firms that are either industrially or globally diversified.

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Conclusion: The evidence of this paper implies that global diversification predominantly exposes a firm to a greater level of credit risk compared to industrial diversification or geographic dispersion. The impacts of other types of diversification, such as industrial diversification and geographic dispersion, on the cost of bank loans are negligible compared to the globalization of firms.

Consistency: The findings of the paper support the argument of prior literature that internationalization is associated with an exposure to a host of local and foreign risk factors and agency problems that eventually increases the cost of bank loans.

Keywords: bank-loan contracting, geographic dispersion, global diversification, industrial diversification, organizational structure

JEL Classification Codes: G31, G32, G14, F23, L22

INTRODUCTION

Literature suggests that organizational forms, such as industrial diversification and global diversification, affect bank loan contracting (e.g., Mansi and Reeb 2002; Li, Qiu, and Wan 2011; Demirkan, Radhakrishnan, and Urcan 2012; Hann, Ogneva, and Ozbas 2013; Franco, Urcan, and Vasvari 2016). Another important type of organizational form that has received inadequate attention in the literature of the cost of debts is geographic dispersion and its effect on bank debt. This paper is the first attempt in the literature to include all three important forms of organizations and all possible combinations of organizational forms in the empirical setting that has the advantage of identifying the most influential organizations in affecting the cost of external finance.

The three organizational forms this paper examines are:

1. Industrial diversification that captures the firms with operations in multiple industries
2. Global diversification that includes the U.S. firms operating in more than one country
3. Geographic dispersion that covers the firms with subsidiaries dispersed across different regions of the United States¹

Given that a significant portion of firms that are diversified in any one particular form are also diversified in other forms, it is important to consider all three forms in the multivariate analyses to capture the exact impact of any specific form of diversification. For example, in my sample of diversified firms with loan contracts spanning from the period of 1994 to 2009, I find that more than 20 percent of the observations are diversified in all three forms.

¹For example, think about three distinct firms, firm A, firm B, and firm C. An example of an industrially diversified firm is firm A if that firm operates in multiple industries, such as retail and information technology. Firm B should be considered as internationally or globally diversified if that firm has at least one subsidiary outside of the United States. Finally, the firm C should be considered as geographically dispersed if that firm has subsidiaries in more one region in the United States. A breakdown of regional classification is available in Appendix B.

Individually, how each type of diversification could affect the pricing of a loan is an empirical question. For example, while industrial diversification could reduce business risk through facilitating a more stable stream of cash flows generated from economically uncorrelated divisions (Lewellen 1971; Smith and Stulz 1985), it could also potentially increase credit risk through severe agency problems associated with diversification, such as inefficient use of internal capital through cross-subsidization of divisions (e.g., Rajan, Servaes, and Zingales 2000). However, existing evidence on the relationship between industrially diversified firms and loan pricing mainly supports the risk-mitigating effects of diversification (e.g., Hann, Ogneva, and Ozbas 2013).

Similarly, we can find two opposing views on the effects of global diversification on risk management. On the one hand, internationalization could provide a greater scope of asset utilization and access to a broader capital market, which can significantly create more value and mitigate business risks (Errunza and Senbet 1984; Morck and Yeung 1991; Jang 2017). On the other hand, it could expose the firms to more political uncertainty, exchange rate risk, different legal environments, and more agency problems created from cultural differences and geographical distances between headquarters and foreign divisions (e.g., Reeb, Kwok, and Baek 1998; He and Ng 1998). Existing evidence documents a negative association between global diversification and the cost of debts, which supports the positive view of internationalization (e.g., Li, Qiu, and Wan 2011).

Likewise, there are two opposing views on the impact of geographic dispersion on the risk and valuation of a firm. One hypothesis is based on informational frictions, which suggests that geographic dispersion increases both information and monitoring costs since the distance between headquarters and divisions make the firms depend more on quantifiable information at the loss of soft information (Petersen and Rajan 2002). However, the hedging view hypothesis suggests that the firms with dispersed operations across the regions are better able to manage local or regional economic shock and, thus, could obtain capital at a low cost.

Among the three types of diversification, I find that global diversification consistently comes up at the top, both in terms of economic and statistical significance, in affecting the cost of bank loans. Specifically, on average, U.S. firms incur 7.7 percent additional costs from international expansion compared to all concentrated firms or the firms with no forms of diversification. Since a significant portion of globally diversified firms is also either industrially diversified or geographically dispersed, in further analysis, I narrow down my focus to the firms that are “only” globally diversified. I find that international diversification alone results in a 14.5 percent increase in the cost of a loan compared to the cost of concentrated firms.

My further findings suggest that banks are less likely to favor firms that are “only” geographically dispersed and the firms that are diversified in all three forms. I also examine the effects of organizational forms on the non-price loan terms and find no significant increase in restrictions or cost in non-price loan terms for globally diversified firms. However, I find geographically dispersed firms that are either industrially or globally diversified could experience a significant increase in covenant requirements. Overall, my findings suggest that credi-

tors consider internationalization as the riskiest form of diversification, followed by geographic dispersion and diversification in all three forms.

My paper relates to several streams of current literature. First and foremost, this paper is the first attempt in the literature to include three important forms of organizations and all possible combinations of organizational forms in an empirical setting. This has the advantage of identifying the exact types of firms that most influence the cost of external finance. The evidence of the paper contributes to an extensive literature of organizational structure and the issues of intra-firm frictions and agency problems (e.g., Jensen and Meckling 1976). Among different types of organizational forms, I find that globally diversified firms face a higher cost of bank loans than any other form of diversification. This suggests the importance of agency problems and various risks associated with internationalization (Reeb, Kwok, and Baek 1998; Denis, Denis, and Yost 2002), which could severely affect the creditors' assessment of the underlying risk in foreign operations.

Second, a comprehensively studied topic in the literature of organizational forms is industrial diversification, which is argued to have more stable cash flows (Lewellen 1971) and lower expected bankruptcy costs (e.g., Smith and Stulz 1985). However, findings of prior empirical work show a diversification discount (e.g., Berger and Ofek 1995; Lamont and Polk 2002), which could mainly arise from agency problems, such as an inefficient use of internal capital market (e.g., Rajan, Servaes, and Zingales 2000). On the other hand, prior literature documents a negative relationship between industrial diversification and the cost of debt (Franco, Urcan, and Vasvari 2016; Hann, Ogneva, and Ozbas 2013; Aivazian, Qiu, and Rahaman 2015). I find that industrial diversification does not significantly affect the cost of bank loans. However, I find that global diversification and geographic dispersion could significantly influence bank loan contracting. These results suggest the importance of regional or global diversification in influencing the cost of capital.

Third, the paper relates to the literature of international diversification, which mainly argues that internationalization creates severe organizational challenges and agency problems due to exposure to different legal environments, cultural differences, and geographic distances (e.g., Lee and Kwok 1988; He and Ng 1998). Supporting this view, I find that global diversification significantly and positively influences the pricing of bank loans.²

Finally, the paper is the first to consider geographic dispersion in measuring the impact on the cost of bank loans.³ Based on the findings of previous literature indicating that geographic dispersion is associated with valuation discount and more prevalence of agency problems (e.g., Landier, Nair, and Wulf 2000;

²The evidence of the paper contradicts prior findings that find that international diversification is negatively associated with the cost of debts (e.g., Reeb, Mansi, and Allee 2001; Li, Qiu, and Wan 2011). However, prior work on this issue did not take the other two forms of diversification in their empirical specifications as I have done in this paper. Nonetheless, the results strongly support the previous findings that global diversification tends to destroy value (e.g., Denis, Denis, and Sarin 2002; Moeller and Schlingemann 2005).

³Even though there is a scarcity of research in finding the relationship between geographic dispersion and the cost of bank loan, the issue of geographic dispersion in the literature of finance, however, is a widely researched area that addresses various topics such as payout policy (e.g., John, Knyazeva, and Knyazeva 2011), behavior of the bondholders (Francis, Hasan, and Waisman 2007), financing choices (e.g., Loughran 2008), executive compensation (e.g., Francis et al. 2016), and corporate governance (e.g., Knyazeva, Knyazeva, and Masulis 2013), among others.

Gao, Ng, and Wang 2008), we can predict a positive relationship between the geographic dispersion and the cost of debt. Confirming the prediction, I find that firms that are only geographically dispersed, neither industrially nor globally diversified, experience a high cost of bank loans.

The rest of the paper is organized as follows. The next section presents the literature review and hypotheses development. After that, the data and methodology are discussed, followed by the empirical findings, and closing with the paper's conclusions.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Industrial Diversification and the Cost of Debt

From the creditors' viewpoints, the main advantage of industrial diversification is the lower expected default rate because of the higher stability of earnings resulting from combining different business segments with an imperfectly correlated stream of cash flows (Lewellen 1971). Such coinsurance might reduce expected bankruptcy costs (e.g., Smith and Stulz 1985; Mayers and Smith 1990) and provide access to a strong internal capital market that can be used to increase market power (Villalonga 2004) and select better projects (Stein 1997).⁴ Moreover, creditors can anticipate the future performances of conglomerates more accurately since greater diversification cancels out the forecasting errors of cash flows of the divisions and improves transparency (Hadlock, Ryngaert, and Thomas 2001; Thomas 2002).

However, agency theories suggest that managerial discretion in allocating resources across the segments could increase agency costs of the conglomerates (e.g., Berger and Ofek 1995; Shin and Stulz 1998; Lamont and Polk 2001). For example, managers might engage in inefficient use of internal capital market through cross-subsidizing between divisions (Meyer, Milgrom, and Roberts 1992; Rajan, Servaes, and Zingales 2000; Scharfstein and Stein 2000) and choose sub-optimal projects (e.g., Jensen 1993; Glaser, Lopez-De-Silanes, and Sautner 2013). Moreover, additional agency costs could result from informational asymmetries between the headquarter and divisional managers (e.g., Wulf 2009).

Existing empirical evidence on the relationship between industrially diversified firms and the cost of debts largely support the benefits associated with diversification. For example, empirically, Hann, Ogneva, and Ozbas (2013) find that diversified firms, on average, enjoy a significantly lower cost of capital than comparable portfolios of focused firms. Similarly, findings of other papers show that industrial diversification could be negatively associated with bank loan rates (Aivazian, Qiu, and Rahaman 2015) and bond-offering yields (Franco, Urcan, and Vasvari 2016).

⁴Another potential advantage associated with diversified firms that can exclusively be achieved by banks is lower monitoring and information costs. Usually, banks suffer from diseconomies of scope created by monitoring disincentives or by deteriorating quality of credit if they diversify their lending portfolio into the highly competitive industries in which they have had very little prior experience (Acharya, Hasan, and Saunders 2006). Such monitoring disincentives and lack of experience can be overcome by lending to the diversified firms since banks monitor and collect information from a conglomerate entity operating in multiple industries under the control of a single management team.

International Diversification and the Cost of Debt

International diversification could severely increase the uncertainties associated with future cash flows. Such uncertainties could arise from greater exposure to exchange rate fluctuations, political uncertainty, legal complexities and constraints in operating foreign divisions under different legal environments, and agency problems associated with cultural differences, geographic distances, and international operations (e.g., Lee and Kwok 1988; Burgman 1996; Reeb, Kwok, and Baek 1998; He and Ng 1998). In fact, prior literature provides evidence of a valuation discount for internationally diversified firms (Denis, Denis, and Yost 2002; Moeller and Schlingemann 2005; Freund, Trahan, and Vasudevan 2007).

However, multinationals have the advantage of providing indirect access to the foreign capital market (Errunza and Senbet; 1981; 1984). This is especially true for banks facing strict regulations and entry barriers that can diversify their lending portfolios by simply investing in multinationals. Additionally, internationalization provides synergistic benefits of scalable assets that can be utilized at a broader scope (Caves 1971; Morck and Yeung 1991), and provide a greater funding flexibility (Jang 2017).⁵

Evidence of empirical papers that examine the relationship between international diversification and the cost of debts mostly supports the favorable view of internationalization. For example, findings of prior research suggest that international diversification is negatively associated with the cost of debts (Reeb, Mansi, and Allee 2001) and bank loan spreads (Li, Qiu, and Wan 2011), whereas Mansi and Reeb (2002) show that such negative relationships attribute to the early stage of internationalization and are not monotonic.

Geographic Dispersion and the Cost of Debt

As prior literature shows, corporate geographic dispersion could significantly affect firm value (Gao, Ng, and Wang 2008; Kang and Kim 2008), market performance (Garcia and Norli 2012), earnings management (Shi, Sun, and Luo 2015), corporate policies and strategies (Landier, Nair, and Wulf 2009), and firm risk (Knyazeva and Knyazeva 2019). A dominant view in the literature is that geographic dispersion may create informational frictions between headquarters and divisions and, thus, could significantly increase monitoring and information costs both for internal and external claimholders. Physical distance impairs the use of personal communication as a significant source of information and makes firms more dependent on hard or quantifiable information at the loss of soft information (Petersen and Rajan 2002).⁶ Therefore, lenders, being concerned with higher monitoring and information costs and the absence of high-quality

⁵Foreign banks, in establishing a financial contract, may want the multinationals to pledge collateral, which can be demanded by lenders often to reduce the information asymmetry (Sufi, 2007). The collateral facility that a multinational can provide to their foreign lender can obtain funds at a lower cost as it provides greater incentive for the lenders to monitor, and thereby increase, the transparency. Using the financial crisis period of 2007–2009 as a shock to the capital market, Jang (2017) shows that multinationals are better at dealing with financial constraints in the local market by utilizing their access to the foreign capital market.

⁶That is why distance is often employed to capture the essence of information asymmetry in the literature (Grinblatt and Keloharju 2001; Garmaise and Moskowitz 2004).

information or soft information, may charge a higher cost of a loan for the dispersed firms.⁷

However, there is a hedging benefit of geographic dispersion that might make the geographically diversified firms immune to the adverse impacts of local economic shocks. Necessarily, operations in multiple regional markets could facilitate better management of regional economic advantages and disadvantages and access to a strong internal capital market. Such hedging advantages associated with geographic dispersion might make creditors charge a low cost for a loan.

DATA AND METHODOLOGY

I use the Compustat Annual Industrial database to collect firm-level information and the Compustat Business segment to collect segment-level information on firms' characteristics for the analysis. Initially, following prior literature (e.g., Berger and Ofek 1995), the sample is constructed based on the U.S. companies that have annual sales of at least \$20 million in the sample period of 1994–2009. Firms with any segment operating in the utility (SIC codes 4900–4999) or financial sectors (SIC codes 6000–6999) are excluded. The sample requires the firms to have information on the key variable available in both Compustat Annual Industrial and Compustat Business Segment databases.

Additionally, I use a database created by Dyreng, Lindsey, and Thornock (2013) to collect information of the subsidiary location of the U.S. firms to measure geographic dispersion and global diversification of each firm.⁸ Finally, I use Loan Pricing Corporation's (LPC) DealScan database to collect information on bank loan contracting.⁹ A detailed discussion on the construction of key variables from different data sources are presented below. My final sample consists of 16,704 loan-year observations from 1994 to 2009.

The Measure of Geographic Dispersion

Based on the Bureau of Economic Analysis' nine census regions in the United States, a firm is geographically dispersed if it has subsidiaries located in more than one region.¹⁰ As mentioned above, to get information on the locations of firms' subsidiaries, I use the data of Dyreng, Lindsey, and Thornock (2013). They created their database by developing a text search program to extract lists and names of the locations of significant subsidiaries of the firms in the United States from the filings submitted to the Securities and Exchange Commission (SEC).

The Measure of Industrial and Global Diversification

A firm-year is described as industrially diversified if it operates in more than one industry defined by the 4-digit level of the standard industrial classification (SIC)

⁷The importance of physical proximity for the firms' access to capital has been echoed in a large body of literature on banking that argues that proximity in the locations of borrowers and lenders are correlated with the possibilities of the establishment of lending relationship (e.g., Petersen and Rajan 2002; Degryse and Ongena 2005; Agrawal and Hauswald 2010).

⁸I am thankful to Scott Dyreng for making this data available for public use.

⁹For a detailed description of the LPC DealScan database, see Strahan (1999) and Chava and Roberts (2008).

¹⁰Appendix B shows the details of regional classification.

code. Furthermore, globally diversified firms have at least one subsidiary located out of the United States.

Cost of Bank Debt

Following prior literature, I employ the loan spread over LIBOR charged by the banks at the period of loan origination as the measure of the cost of bank debt. In the DealScan database, the variable *All-in-Drawn* shows the amount the borrower pays over LIBOR in basis points for each dollar drawn down. Finally, following previous work (e.g., Sunder, Sunder, and Wongsunwai 2014), I use the natural logarithm of the *All-in-Drawn* as the measure of the cost of bank debt.

EMPIRICAL FINDINGS OF THE PAPER

Summary Statistics

In Table 1, panel A shows the summary statistics of firm characteristics using firm-year data. Column 1 shows the mean values of the key variables of *all concentrated firms*, which represent those not diversified in any form. Columns 2 through 8 represent the differences between mean values of the attributes of all concentrated firms and mean values of the firms with other types of organizational forms. I describe the definitions of different forms of organizations in detail in Appendix A. Compared to *all concentrated firms* from column 2, *only diversified firms* are significantly larger and more leveraged, but they hold significantly less cash.

Furthermore, we can observe in column 3 that all firm attributes except the cash holding, market-to-book ratio (M/B), and return volatility are significantly higher for *only geographically dispersed firms*. Column 4 shows that *only globally diversified firms* are significantly larger, more levered, more profitable, and have higher market-to-book ratios and return on assets (ROA). Also, they seem considerably less risky than *all concentrated firms* as the value of return volatility and Z-score indicates. We can observe similar characteristics for other types of organizational forms with different combinations of diversification from columns 5 through 7. Column 8 shows that, compared to the all concentrated firms, the *all diversified firms* are the largest, and have the highest Z-score and the lowest return volatility. Overall, Panel A reveals the presence of systematic differences between non-diversified and diversified firms.

Panel B of Table 1 shows the loan characteristics using loan-year level data. Column 1 shows the mean values of different loan characteristics for *all concentrated firms*. Differences between the mean values of column 1 and the mean values of firms under different organizational forms are shown in columns 2 through 8. In the first row of Panel B, which shows loan spread as the measure of the cost of loans, we can observe that, except for the group of *only diversified firms*, the mean value of the cost of loans for *all concentrated firms* is significantly higher than any other group. The security requirement is more likely to be imposed on *all concentrated firms*. However, the loan size is larger, and the number of covenant requirements are smaller for all types of diversified firms.

TABLE 1. Summary Statistics

This table shows summary statistics of the key variables used in the multivariate analyses. The sample includes 10,636 firm-year observations and 16,704 loan-year observations for the period of 1994–2009. Panel A and B show the firm and loan characteristics of the firms with different organizational forms, respectively. All variables are defined in Appendix A. Column 1 shows the mean values of the variables of *all concentrated firms*, which are firms not diversified at any dimensions. Columns 2 through 8 show the differences in mean values of *all concentrated firms* and mean values of the firms with other types of organizational forms. The statistical significance at 1 percent, 5 percent, and 10 percent levels are indicated by ***, **, and * symbols, respectively.

Panel A: Firm Characteristics								
	Mean Value	Differences in Mean Values of <i>All Concentrated Firms</i> and the Firms with Different Types of Organizational Forms						
	(1) All Concentrated Firms	(2) Only Industrially Diversified Firms	(3) Only Geographically Dispersed Firms	(4) Only Globally Diversified Firms	(5) Both Geographically Dispersed and Industrially Diversified Firms	(6) Both Industrially and Globally Diversified Firms	(7) Both Geographically Dispersed and Globally Diversified Firms	(8) All Diversified Firms
Total assets (\$ millions)	792.600	−884.100***	−1743.500***	−445.400***	−4117.300***	−3556.6***	−2544.900***	−6373.900***
Leverage	0.282	−0.064***	−0.047***	0.012	−0.047***	−0.009	−0.002	0.002
M/B	1.816	0.199	0.195***	−0.149**	0.271***	0.102	−0.065	0.109**
Profitability	0.065	−0.035	−0.062***	−0.034***	−0.065***	−0.051***	−0.070***	−0.070***
Tangibility	0.385	0.041**	−0.006	0.091***	0.053***	0.098***	0.099***	0.109***
Z-score	0.956	−0.401	−0.570**	−0.458***	−0.860***	−0.567***	−0.814***	−0.899***
Return volatility	0.167	0.002	0.032***	0.015***	0.042***	0.039***	0.040***	0.057***
ROA	0.065	−0.035	−0.062***	−0.034***	−0.065***	−0.051***	−0.070***	−0.070***
Cash holding	0.103	0.029***	0.037***	−0.010*	0.052***	0.022***	0.004	0.033***
N	927	280	949	2492	545	1100	2203	2140
Percentages of total	0.087	0.026	0.089	0.234	0.051	0.103	0.207	0.201

Panel B: Loan Characteristics								
	Mean Value	Differences in Mean Values of <i>All Concentrated Firms</i> and the Firms with Different Types of Organizational Forms						
	(1) All Concentrated Firms	(2) Only Industrially Diversified Firms	(3) Only Geographically Dispersed Firms	(4) Only Globally Diversified Firms	(5) Both Geographically Dispersed and Industrially Diversified Firms	(6) Both Industrially and Globally Diversified Firms	(7) Both Geographically Dispersed and Globally Diversified Firms	(8) All Diversified Firms
Loan spread	244.200	−6.126	30.570***	27.689***	42.952***	66.661***	73.176***	94.520***
Loan size	109.200	−16.562	−175.200***	−17.873*	−218.00***	−187.20***	−191.900***	−412.10***
Loan maturity	43.918	−1.711	−4.654***	1.692**	−4.813***	−0.824	−3.128***	−0.388
Syndication dummy	0.842	−0.056***	−0.127***	0.098***	−0.128***	−0.053***	−0.088***	−0.116***
Covenant	3.648	−0.255*	−0.170*	0.694***	−0.463***	0.550***	0.238***	0.683***
Security dummy	0.726	0.009	0.088***	0.079***	0.164***	0.202***	0.225***	0.329***
N	1,340	442	1,512	3,826	912	1,772	3,478	3,422
Percentages of total	0.080	0.026	0.091	0.229	0.055	0.106	0.208	0.205

Results from the Multivariate Analyses

To examine the effect of different organizational forms on the cost of bank debt, initially, I regress the loan spread on the various dummy variables capturing the types of organizational forms and variables representing the characteristics of firms and loans.

In each model, to control for firm characteristics, I use the natural logarithm of a firm's total assets as *size* as a control variable since larger firms are more likely to end up with more favorable loan contracts due to a less severe problem of information asymmetry associated with their operations. *Leverage* controls for a firm's current status of debt usage, which should be positively associated with the probability of bankruptcy and the borrowing cost. On the other hand, another employed control variable is *ROA*, as the higher value of return on assets is likely to lower the default risk and the cost of borrowing. The variable *tangibility* is to control for a firm's ability to obtain capital with a lower cost because of the higher recovery rates associated with the tangible assets. I include *M/B*, the ratio of the market value of assets to the book value of assets, to capture a firm's growth opportunities. The variable *return volatility* is expected to be positively correlated with the cost of debt as it works as the proxy to measure a firm's riskiness. I also include *Z-score*, which is the Altman's Z-score, to control default risk. Note that a higher Z-score indicates a lower risk of default.

Further, I control for the loan characteristics that are important for the cost of bank lending. The natural logarithm of the loan amount is *Log(Loan Size)*, which is supposed to be negatively related to the loan rate, reflecting the economics of scale associated with the amount of bank loan. I include the natural logarithm of the maturity of loan as expressed by months, which should be positively related to the loan rate because there is an inverse association between the liquidity and the duration of debt. The variable *security dummy* is the variable with value 1 if the loan is secured, and 0 otherwise. *Syndication dummy* equals 1 if the loan is syndicated, otherwise, the value is 0.

Organizational Forms and the Cost of Bank Loans

In Table 2, I include the three types of organizational forms to see their effect on loan spread. In each model, in addition to controlling for firm characteristics, I control for loan characteristics that are supposed to contain considerable relationships with the cost of debt. Further, I control for industry fixed effects in column 1 and year fixed effects in column 2. Note that in each model, the benchmark group is concentrated firms, which are the domestic firms that operate in a single-industry and have subsidiaries concentrated in a single region within the United States. In other words, the benchmark group includes the firm years that are not diversified in any dimension. The results show that industrial diversification and geographic dispersion tend to negatively affect the cost of a bank loan. However, these two measures of diversification do not show any statistical significance. Importantly, the coefficient of global diversification is found to be positive and statistically significant at the 10 percent level.

Further, to have a more precise view on the relationship between the measures of diversification and the cost of debt, I control for the firm fixed effects in the regression; the results are presented in column 2. Once again, I find that the coefficient of global diversification is positive and statistically significant at the

TABLE 2. Organizational Forms and the Cost of Bank Loan

This table presents the regression results on the relationship between organizational forms and the cost of bank loan. The dependent variable is Log(loan spread) in all specifications. All variables are defined in Appendix A. Standard errors are adjusted for heteroskedasticity and within firm clustering and are reported in parentheses. The statistical significance at 1 percent, 5 percent, and 10 percent levels are indicated by ***, **, and * symbols, respectively.

	(1)	(2)
Measures of Organizational Forms		
Geographic dispersion	−0.006 (0.013)	−0.004 (0.021)
Industrial diversification	−0.006 (0.014)	0.019 (0.026)
Global diversification	0.029* (0.016)	0.077*** (0.025)
Firm Characteristics		
Log(Assets)	−0.065*** (0.009)	−0.103*** (0.018)
Leverage	0.528*** (0.050)	0.523*** (0.067)
Tangibility	−0.205*** (0.044)	−0.241** (0.126)
Cash holding	0.021 (0.066)	0.129 (0.114)
ROA	−0.315*** (0.092)	−0.453*** (0.150)
M/B	−0.047*** (0.011)	−0.012 (0.016)
Return volatility	1.067*** (0.089)	0.747*** (0.112)
Z-score	0.003 (0.005)	−0.013 (0.010)
Loan Characteristics		
Log(Loan size)	−0.099*** (0.007)	−0.086*** (0.008)
Log(Loan Maturity)	−0.060*** (0.012)	−0.048*** (0.013)
Security dummy	0.403*** (0.014)	0.252*** (0.018)
Syndication dummy	−0.057*** (0.018)	−0.054** (0.024)
Constant	4.854*** (0.117)	5.093*** (0.216)
Control for		
Loan purposes and loan types	Yes	Yes
Credit rating	Yes	Yes
Year effects	Yes	Yes
Industry effects	Yes	N.A.
Firm fixed effects	No	Yes
Observations	16,541	16,606
Adjusted R ²	0.687	0.794

1 percent level. The results suggest that, on average, firms could experience a 7.7 percent increase in the cost of a loan after expanding their operations globally. Note that the benchmark group consists of the firms that are both geographically and industrially focused. So, the 7.7 percent increase shows the additional cost incurred by the global firms compared to the focused or concentrated firms. The other two measures of diversification do not produce any notable effects.¹¹ Overall, from Table 2, in the presence of controlling for all three types of diversification, I find that global diversification is the one that significantly affects the loan pricing.

A significant portion of firms that are diversified in one form are also diversified in other forms, as can be observed from Table 1. For example, around 20.5 percent of firms are diversified in all three forms. Thus, in the presence of firms that are diversified in multiple ways, we cannot ignore the combined effects of diversification, such as the effects of industrially and globally diversified firms. Additionally, after controlling for the combined effects of diversification, it would be possible to single out the individual diversification effect.

I include all combinations of diversification in the regression and present the results in Table 3. I find that the firms that are only geographically dispersed, or the domestic firms that operate in a single industry but have subsidiaries dispersed across the regions in the United States, are likely to experience a 4.3 percent additional cost of a loan compared to the concentrated firms. The coefficient of *only geographic dispersion* is found to be statistically significant at the 10 percent level. Moreover, the *only globally diversified firms*, or the multinationals that operate in a single industry and have U.S. subsidiaries concentrated in a single region, tend to experience a 7.3 percent increase in loan pricing compared to the pricing of the benchmark group. The coefficient of *only global diversification* is statistically significant at the 1 percent level. Firms that are diversified in all three forms also exhibit a significant increase in the cost of bank loans. However, other types or combinations of organizational firms do not document any significant impacts on the cost of the loan. Overall, from Table 3, we observe that the group *only global diversification* makes the firms experience the most significant—both economically and statistically—increase in loan pricing.

Organizational Forms and Non-Price Bank Loan Terms

As the literature suggests that non-price terms—like short-term maturity or requirement of collateral—are components of indirect costs incurred by borrowers (Smith and Warner 1979; Graham, Li, and Qiu 2008), I also study the impact of organizational forms on the non-price bank contracts.

First, I focus on the maturity of a loan, which is an important non-price contract that is negatively related to the liquidity and bargaining capability of the firms. Also, the agency costs of debt associated with the compensation scheme can be controlled by employing the short-term debt (Brockman, Martin, and Unlu 2010). In column 1 of Table 4, I include the natural logarithm of the maturity of loan as a dependent variable in a fixed-effects regression model and observe whether the organizational forms have to play any significant role to

¹¹Since the average loan spread of the concentrated firms is 244 basis points, as can be observed in Table 1, a 7.7 percent increase implies that an additional 18.8 basis points (244×0.077) to be imposed on the globally diversified firms.

TABLE 3. All Combinations of Organizational Forms and the Cost of Bank Loan

This table presents the regression results on the relationship between different combinations of organizational forms and the cost of bank loan. The dependent variable is Log(loan spread) in all specifications. All variables are defined in Appendix A. Standard errors are adjusted for heteroskedasticity and within firm clustering and are reported in parentheses. The statistical significance at 1 percent, 5 percent, and 10 percent levels are indicated by ***, **, and * symbols, respectively.

	(1)
Measures of Organizational Forms	
Only geographic dispersion	0.043* (0.024)
Only industrial diversification	0.012 (0.033)
Only global diversification	0.073*** (0.023)
Both geographic dispersion and industrial diversification	0.031 (0.030)
Both geographic dispersion and global diversification	0.038 (0.024)
Both industrial and global diversification	0.044 (0.028)
All diversified	0.047* (0.026)
Firm Characteristics	
Log(Assets)	-0.065*** (0.009)
Leverage	0.528*** (0.050)
Tangibility	-0.204*** (0.043)
Cash holding	0.023 (0.066)
ROA	-0.315*** (0.092)
M/B	-0.047*** (0.011)
Return volatility	1.069*** (0.089)
Z-score	0.003 (0.005)
Loan Characteristics	
Log(Loan size)	-0.099*** (0.007)
Log(Loan maturity)	-0.060*** (0.012)
Security dummy	0.402*** (0.014)
Syndication dummy	-0.054*** (0.018)
Constant	4.817*** (0.116)
Control for	
Loan purposes and loan types	Yes
Credit rating	Yes
Year effects	Yes
Industry effects	Yes
Observations	16,541
Adjusted R ²	0.688

TABLE 4. Organizational Forms and Non-Price Loan Terms

This table presents the OLS and probit regression results on the relationship between all combinations of organizational forms and non-price loan terms. Columns 1 and 3 show the OLS regression results using Log(Loan maturity) and Covenant respectively as the dependent variables. Column 2 uses the Security dummy as the dependent variable and employs a probit model. All variables are defined in Appendix A. Standard errors are adjusted for heteroskedasticity and within firm clustering and are reported in parentheses. The statistical significance at 1%, 5%, and 10% levels are indicated by ***, **, and * symbols, respectively.

	(1) Log(Loan Maturity)	(2) Security	(3) Covenant
Measures of Organizational Forms			
Only geographic dispersion	0.015 (0.021)	0.013 (0.084)	0.012 (0.033)
Only industrial diversification	0.013 (0.033)	0.032 (0.117)	0.017 (0.046)
Only global diversification	−0.003 (0.020)	0.095 (0.077)	−0.016 (0.029)
Both geographic dispersion and industrial diversification	0.011 (0.026)	−0.089 (0.101)	0.083** (0.040)
Both geographic dispersion and global diversification	0.016 (0.020)	−0.021 (0.077)	0.084*** (0.029)
Both industrial and global diversification	0.006 (0.022)	0.119 (0.086)	0.010 (0.033)
All diversified	0.003 (0.020)	0.009 (0.082)	0.035 (0.032)
Firm Characteristics			
Log(Assets)	−0.008 (0.006)	−0.249*** (0.021)	−0.058*** (0.010)
Leverage	0.058** (0.029)	0.910*** (0.111)	−0.061 (0.042)
Tangibility	0.042 (0.031)	−0.307 (0.124)	0.052 (0.050)
Cash holding	−0.142*** (0.052)	−0.157 (0.184)	−0.262*** (0.075)
ROA	0.117* (0.062)	−1.019*** (0.284)	0.193** (0.094)
M/B	−0.003 (0.003)	−0.057*** (0.020)	−0.006 (0.006)
Return volatility	−0.358*** (0.076)	2.692*** (0.360)	−0.157 (0.103)
Z-score	0.001 (0.004)	−0.030 (0.020)	0.004 (0.005)
Loan Characteristics			
Log(Loan size)	0.077*** (0.006)	−0.094*** (0.019)	0.045*** (0.008)
Log(Loan maturity)		0.055* (0.032)	0.032** (0.015)
Security dummy	0.011 (0.010)		0.563*** (0.019)
Syndication dummy	0.177*** (0.019)	−0.008 (0.056)	0.211*** (0.024)
Constant	1.999*** (0.090)	0.242 (0.360)	−0.370*** (0.147)
Control for			
Loan purposes and loan types	Yes	Yes	Yes
Credit rating	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Observations	16,541	16,510	16,541
Adjusted R ²	0.641		0.415
Pseudo R ²		0.316	

influence the variable. The results show that any combination of organizational forms other than firms under *only global diversification* is likely to increase the loan maturity. It suggests that creditors might tend to manage a higher risk arising from international diversification through shortening the period of debt maturity. However, none of the coefficients of the measures of diversification show any statistical significance. The other important findings are that the firm size, cash holding, and volatility are negatively related to the loan maturity. In contrast, the leverage, tangibility, Z-score, ROA, loan size, and syndication of loan affect the maturity of the loan positively.

Next, I employ a probit model to observe the likelihood of the requirement of the security associated with the types of organizations. *Security dummy* is a dependent variable with a value of 1 if the loan is secured, and 0 otherwise. The results in column 2 of Table 4 show that the firms under the categories of *both geographic dispersion and industrial diversification* and *both geographic dispersion and global diversification* are less likely to face the requirement of security. However, none of the effects of the types of diversification on the requirement of security are found to be significant.

Finally, I consider the covenant requirement, which is another important non-price term for the banks to deal with potential agency problems created by borrowers. I follow Graham, Li, and Qiu (2008) to calculate the covenant intensity in a loan facility as the natural logarithm of one plus the total number of covenants, or as $\text{Log}(1 + \text{Covenant})$. From the fixed effects regression using $\text{Log}(1 + \text{Covenant})$ as the dependent variable, the results in column 3 of Table 4 indicate that there two types of organizational forms that could be associated with a significant increase in covenant requirement. The first form type includes the firms that are both geographically dispersed and industrially diversified, and the second form type consists of the firms that are both geographically dispersed and globally diversified. The result implies that banks impose higher requirements of covenants for the geographically dispersed firms that are also either industrially diversified or internationally diversified.

Robustness Tests

While it becomes evident from my analyses that types and combinations of organizational forms do matter for the bank loan contract, we cannot ignore the possibility of unobservable firm characteristics affecting the terms of bank loan contracts. After controlling for firms' fixed effects, the result in column 1 of Table 5 shows that the positive effect of *only global diversification* on loan spread is 0.145, which is economically and statistically significant. It suggests that compared to the benchmark group of concentrated firms, the firms that are only globally diversified tend to experience a 14.5 percent higher bank loan costs. Moreover, I find a highly statistically significant and positive effect of the firms that are diversified in all three forms.

Since the basic unit of analysis in this paper is a loan facility, where the borrowers usually receive several intercorrelated loan facilities under the negotiation of a loan package, there is a possibility of interdependence among the facilities. It could be a concern, especially for the deals that consist of several loan facilities received by the same borrowers in the same year. Therefore, a potential

TABLE 5. Robustness Tests

This table shows the robustness tests of the effect of organizational forms on the cost of bank debt. The Log(loan spread) is used as the dependent variable in all specifications of regressions in the table. All variables are defined in Appendix A. Column 1 shows the results of firm-fixed effect regression. Column 2 shows the results of OLS regression using a reduced sample consists of only the largest facility per firm year. Column 3 is the two-stage least square regression using asset maturity as the instrument variable to control for the potential problem of endogeneity associated with debt maturity. In all regressions, standard errors are adjusted for heteroskedasticity and within firm clustering and are reported in parentheses. The statistical significance at 1%, 5%, and 10% levels are indicated by ***, **, and * symbols, respectively.

	(1) Firm Fixed Effect	(2) Firm-Year Level	(3) Instrument for Loan Maturity	(4) Additional Control
Measures of Organizational Forms				
Only geographic dispersion	0.038 (0.039)	0.030 (0.024)	0.042* (0.024)	0.050** (0.024)
Only industrial diversification	0.048 (0.050)	0.019 (0.032)	0.011 (0.033)	0.009 (0.033)
Only global diversification	0.145*** (0.037)	0.065*** (0.023)	0.074*** (0.023)	0.075*** (0.023)
Both geographic dispersion and industrial diversification	0.088 (0.047)	0.018 (0.031)	0.031 (0.030)	0.029 (0.030)
Both geographic dispersion and global diversification	0.096** (0.039)	0.041* (0.024)	0.038 (0.024)	0.042* (0.024)
Both industrial and global diversification	0.110** (0.048)	0.043 (0.027)	0.044 (0.028)	0.047* (0.028)
All diversified	0.131*** (0.043)	0.036 (0.026)	0.048* (0.026)	0.049* (0.026)
Firm Characteristics				
Log(Assets)	-0.102*** (0.018)	-0.096*** (0.009)	-0.065*** (0.009)	-0.071*** (0.008)
Leverage	0.524*** (0.067)	0.524*** (0.053)	0.525*** (0.050)	0.529*** (0.050)
Tangibility	-0.236* (0.125)	-0.193*** (0.043)	-0.207*** (0.044)	-0.222*** (0.043)
Cash holding	0.137 (0.114)	-0.036 (0.063)	0.030 (0.066)	0.011 (0.066)
ROA	-0.454*** (0.151)	-0.217*** (0.078)	-0.321*** (0.094)	-0.303*** (0.092)
M/B	-0.013 (0.016)	-0.046*** (0.010)	-0.047*** (0.011)	-0.047*** (0.011)
Return volatility	0.747*** (0.111)	0.995*** (0.082)	1.100*** (0.091)	0.997*** (0.086)
Z-score	-0.014 (0.010)	0.001 (0.005)	0.003 (0.005)	0.002 (0.005)
Loan Characteristics				
Log(Loan size)	-0.086*** (0.008)	-0.085*** (0.009)	-0.103*** (0.007)	-0.089*** (0.007)
Log(Loan maturity)	-0.048*** (0.013)	-0.103*** (0.015)	-0.001 (0.008)	-0.050*** (0.012)
Security dummy	0.251*** (0.018)	0.386*** (0.014)	0.401*** (0.014)	0.383*** (0.015)
Syndication dummy	-0.051** (0.024)	-0.071*** (0.020)	-0.064*** (0.018)	-0.046** (0.018)
Log(Covenant)				0.074*** (0.011)

(continued)

TABLE 5. Robustness Tests (*continued*)

Loan Characteristics				
Performance pricing				−0.144*** (0.013)
Prior relationship				0.000 (0.012)
Crisis (2008-09)				0.932*** (0.045)
Constant	5.040*** (0.219)	5.109*** (0.112)	4.739*** (0.357)	4.835*** (0.114)
Control for				
Loan purposes and loan types	Yes	Yes	Yes	Yes
Credit rating	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Industry effects	N.A.	Yes	Yes	Yes
Observations	16,605	10,548	16,530	16,294
Adjusted R ²	0.794	0.702	0.687	0.696

problem of biased estimation might result from treating the loans as independent while they are correlated with each other. To deal with this issue, I have standard errors adjusted for within-firm clustering in all regression specifications used in this study. In addition, I create a reduced sample that only consists of the largest facility obtained by each firm-year and conduct the test again. The results are presented in column 2 of Table 5. Confirming my previous findings, I document a highly significant and positive effect of the firms that are *only globally diversified*.

Another issue of endogeneity may come from the use of loan maturity as an independent variable and the loan spread as the dependent variable in the regression, where it can be possible that the loan maturity and loan spread are determined simultaneously. I deal with this issue by employing a two-stage least square regression. In the first stage, the debt maturity is regressed on a firm's asset maturity, and then the predicted value of debt maturity is used on the right-hand side of the second stage regression. I find that the types of organizational forms that play significant roles throughout the study also remain both economically and statistically significant after controlling for the endogeneity of loan maturity, as the results of column 3 of Table 5 shows.

Finally, in column 4, I control for additional control variables that might be influential in determining the cost of debts. First, since covenants are an essential part of loan contracts, I control for natural logarithm of the total number of covenants in the regression. Another important variable to control is performance pricing, which might cause the variation in loan charges based on the borrower's credit or financial performances (Asquith, Beatty, and Weber 2005). Therefore, I include a dummy variable *performance pricing*, which is equal to 1 if the loan facility includes the provision of performance pricing. Furthermore, since previous studies suggest that prior banking relationships with the lead arranger could influence the loan contracting terms (e.g., Bharath, Sunder, and Sunder 2008), I include a dummy variable *prior relationship*. *Prior relationship* is equal to 1 if the lead bank of the current loan was a lead arranger of the same borrower in loan transactions that took place in the prior five years. Finally, I

control for the global financial crisis period to control for the extreme influence of crisis periods on loan costs. In column 4 of Table 5, we can observe that the inclusion of additional control variables does not affect the coefficients of the organizational forms. I find that the coefficient of the dummy variable *only global diversification* is positive and statistically significant at the 1 percent level.

CONCLUSION

A significant portion of firms that is diversified in one form, either industrially or geographically, is also diversified in other forms. Therefore, in the absence of controlling for each type of diversification, we might obtain less-accurate results examining the effect of diversified firms on the cost of debts. In this paper, I examine three important types of diversified firms—industrially diversified, globally diversified, and geographically dispersed—to examine the diversification effect on the cost of bank loans. From the context of loan pricing, the extant literature provides evidence on the effects of industrial and global diversification. However, how the creditors could respond to the firms that have subsidiaries dispersed across different regions is inadequately explored in the existing literature. This paper fills this gap by exploring all three types of diversification.

The findings of the paper, to a large extent, strongly support the view of prior literature that global diversification, due to a host of local and foreign risk factors and agency problems, tends to destroy a firm's value. Specifically, I find that firms that are globally diversified experience a higher cost of bank loans. However, I did not find any significant impact by diversification on non-price loan terms, except that the findings show that geographically dispersed firms that are also either industrially or globally diversified could face a significant increase in covenant requirements.

The paper clearly shows the credit risks associated with global diversification, which could be more detrimental than other forms of diversification, such as industrial diversification. However, future studies that directly examine the relative importance of different types of diversification influencing the various risk factors could help us better understand this issue.

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Appendix A: Definitions of Variables

MEASURES OF ORGANIZATIONAL FORMS

All concentrated Dummy variable equals 1 if firms are not diversified at any dimensions, and 0 otherwise

Industrial diversification Dummy variable equals 1 if firms have segments operating in multiple industries defined by different 4-digit SIC code, and 0 otherwise

Geographic dispersion Dummy variable equals 1 if firms have subsidiaries located in more than one region of the United States, and 0 otherwise

Global diversification Dummy variable equals 1 if firms report of any segment operating in foreign countries, and 0 otherwise

Only industrially diversified Dummy variable equals 1 if firms are only industrially diversified, neither globally diversified nor geographically dispersed, and 0 otherwise

Only geographically dispersed Dummy variable equals 1 if firms are only geographically dispersed, neither globally diversified nor industrially diversified, and 0 otherwise

Only globally diversified Dummy variable equals 1 if firms are only globally diversified, neither geographically dispersed nor industrially diversified, and 0 otherwise

Both geographically dispersed and industrially diversified Dummy variable equals 1 if the firms are geographically dispersed and industrially diversified, not internationally diversified, and 0 otherwise

Both industrially and globally diversified Dummy variable equals 1 if the firms are internationally and industrially diversified, not geographically dispersed, and 0 otherwise

Both geographically dispersed and globally diversified Dummy variable equals 1 if the firms are geographically dispersed internationally diversified, not industrially diversified, and 0 otherwise

All diversified Dummy variable equals 1 if the firms are industrially and globally diversified, and geographically dispersed

FIRM CHARACTERISTICS

Log(Assets)	The natural logarithm of a firm's total assets
Leverage	The sum of long-term debt and debt in current liabilities divided by total assets
Tangibility	Net property, plant, and equity divided by total assets
Cash holding	Cash and marketable securities scaled by total assets
ROA	Return on assets; operating income before depreciation (OIBDP) divided by total assets
M/B	Market-to-book; ratio of market value of assets to book value of asset

Return volatility	The standard deviation of daily stock returns in the year prior to the loan initiation year
Z-score	Following Graham, Li, and Qiu (2008), the modified Altman's (1968) Z-score = $1.2 \times \text{Working capital} + 1.4 \times \text{Retained earnings} + 3.3 \times \text{EBIT} + 0.999 \times \text{Sales}$ / Total assets
Asset maturity	Asset maturity = $(\text{PPE} / (\text{CA} + \text{PPE})) \times (\text{PPE} / \text{Depreciation}) + (\text{CA} / (\text{CA} + \text{PPE})) \times (\text{CA} / \text{COGS})$, where PPE = Gross property, plant, and equipment, CA = Current assets, and COGS = Cost of goods sold

LOAN CHARACTERISTICS

Loan spread	The amount the borrower pays in basis points in excess of LIBOR for each dollar drawn down
Loan size	Total amount of loan facility (in million USD)
Loan maturity	The duration of loan facility in number of months
Syndication	Dummy variable equals 1 if the loan is syndicated, and 0 otherwise
Covenant	Total number of covenants in a loan facility
Security	Dummy variable equals 1 if a loan is secured, and 0 otherwise
Performance pricing	Indicator variable equals 1 if there is a provision of performance pricing included in the loan
Prior relationship	Dummy variable equals 1 if the lead bank was a lead arranger of the same borrower in loan transactions that took place in the prior five years
Loan purpose	Dummy variable for loan purposes, including corporate purposes, debt repayment, working capital, acquisitions, etc.
Loan type	Dummy variable for loan types, including term loan, 364-day facility, revolver greater than one year, revolver less than one year, etc.
Debt rating	Dummy variable for S&P senior debt rating, such as AAA, AA, etc.

OTHER CHARACTERISTICS

Crisis (2008-09)	Indicator variable for the financial crisis period 2008–2009
Industry fixed effects	Dummy variable for each industry defined by Fama-French 48 industry classification

*Appendix B: Regional Classification***ATLANTIC COAST**

Delaware	Georgia	South Carolina
District of Columbia	Maryland	Virginia
Florida	North Carolina	West Virginia

DEEP SOUTH

Alabama	Mississippi
Kentucky	Tennessee

MIDWEST

Illinois	Indiana	Michigan
Ohio	Wisconsin	

MOUNTAIN

Arizona	Colorado	Idaho
Montana	New Mexico	Nevada
Utah	Wyoming	

NEW ENGLAND

Connecticut	Massachusetts	Maine
New Hampshire	Rhode Island	Vermont

PLAINS

Iowa	Kansas	Minnesota
Missouri	North Dakota	Nebraska
South Dakota		

SOUTHERN PLAINS

Arkansas	Louisiana
Oklahoma	Texas

WEST COAST

California	Oregon	Washington
Hawaii	Alaska	

MIDDLE ATLANTIC

New Jersey	New York	Pennsylvania
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Unionization and Firm Inventory Management: Empirical Evidence

Bo Wang

Haizhi Wang

Desheng Yin

Xiurong Yu

Abstract

Motivation: Prior literature reveals that unionizations have a significant effect on firm performance and decision making. In this paper, we explore whether and to what extent the union elections shape firm policy on inventory management.

Premise: This paper focuses on the causal effects of unionization on firm investment in inventory. We argue that the theoretical predictions on firm inventory policy following union election events are mixed, which necessitates empirical investigation of the relation between unionization and firm inventory management.

Approach: We implement the regression discontinuity approach with the union election vote data from 1980 to 2010. We perform a host of sensitivity tests to ensure that our findings are robust.

Results: We document that firms with union election wins have significantly lower inventory levels. This negative relation is more prominent for firms that have higher labor costs, less operational flexibility, and are financially constrained. Our findings also indicate that firms in states with stronger labor rights or with higher labor intensity are associated with lower inventory investment after successful union elections. We further find that firms with union election wins significantly improve their operating efficiency through higher inventory turnovers. Firms tend to shift from bank credit to trade credit to finance their inventory after the unionization.

Conclusion: In response to rising labor costs, operating inflexibility, and financial constraints caused by the union formation, firms choose to reduce their inventory level with the incentives to balance cost, speed up inventory turnover, and save internal capital for future investments.

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Consistency: This paper demonstrates that unionization is one critical factor in corporate inventory management. With the trade-off between inventory holding and shortage risks, firms are more inclined to lean inventory policies to mitigate the costs and risks of unionization.

Keywords: financial constraints, inventory management, operation flexibility, unionization

JEL Classification Codes: C44, G31, G32, J01

INTRODUCTION

Employees as critical stakeholders could participate in corporate activities by forming unions and bargaining with firm managers. Labor unions generally negotiate for higher wages, higher job security, and better benefits, which may incur reallocation of firm resources from shareholders and other stakeholders. Thus unions may actively get involved in the production process and present significant influence on the firm performance (e.g., Clark 1984; Chen, Kacperczyk, and Ortiz-Molina 2011; Bradley, Kim, and Tian 2016; Huang et al. 2017). In this study, we intend to investigate the causal effects of labor unions on one important aspect of firm operation and investment, namely inventory management.

Inventory management is challenging because it requires a trade-off between carrying costs and shortage costs. On the one hand, keeping a lean inventory yields benefits such as minimizing waste and increasing efficiency (Womack, Jones, and Roos 1990), which further leads to improvement of firm performance (Chen, Frank, and Wu 2005, Eroglu and Hofer 2011, Isaksson and Seifert 2014). On the other hand, as a buffer between production and sales, firms must hold sufficient inventory to keep regular production and shield for any uncertainties along the supply chain. Nonetheless, theoretical predictions of the effects of labor unions on firm inventory management can be vague. It is plausible that firms may choose to stockpile inventories to gain bargaining power over unions and countervail the influences of labor unions (Klasa, Maxwell, and Ortiz-Molina 2009; Hamm et al. 2018). It is also plausible that firms may reduce investment in inventories to free up some resources (He, Tian, and Yang 2016) because of the increased labor costs and operational inflexibility induced by labor unions (Chen, Kacperczyk, and Ortiz-Molina 2011). Therefore, the relation between labor unions and firm inventory management is essentially an empirical question, which necessitates further investigation.

In this study, using a sample of 823 union elections collected from the National Labor Relations Board (NLRB) over the 1980–2010 time period, we find the supportive evidence that unionizations have a significant and negative effect on firm investment in inventories. In particular, our results show that firms with successful union election votes tend to have lower inventories in the election year and one year after the election. Our empirical approach, based on a regression discontinuity (RD) design, allows us to draw the causal inference, and our results are robust to a host of sensitivity analyses. We then examine possible mechanisms and report that the negative relation between unionization and firm investment in inventories is stronger for firms with higher pre-election labor costs, lower operating flexibility, and more financial constraints. Furthermore,

our findings reveal that the effects of unions on inventories are more prominent for firms in states with stronger labor rights and that are more labor-intensive. We also report that, after successful union election votes, firms improve operation efficiency by increasing inventory turnover rate and using more trade credits instead of bank loans.

LITERATURE REVIEW

Employees play a critical role in firm operation and decision-making. Organized workers use collective bargaining power to demand higher wages, more benefits, and better job security. The rising labor costs and rent expropriation induced by labor unions lead to reduced operation flexibility and increased cost of capital (Chen, Chen, and Liao 2011; Chen, Kacperczyk, and Ortiz-Molina 2011; Qiu and Shen 2017). Existing literature has documented that labor unions may have negative effects on firm profitability (Clark 1984), cash holding (Klasa, Maxwell, and Ortiz-Molina 2009), and capital investments (Fallick and Hassett 1999). Other research shows that unions are negatively associated with firm innovation (Bradley, Kim, and Tian 2016), CEO compensation (Huang et al. 2017), tax aggressiveness (Chyz et al. 2013), and corporate social responsibility activities (Chun and Shin 2018). To deal with the abovementioned effects of labor unions, firms implement various accounting and financing measures, such as reporting higher losses (DeAngelo and DeAngelo 1991), adopting income-decreasing accounting methods (Bowen, DuCharme, and Shores 1995), smoothing earnings (Hamm, Jung, and Lee 2018), and strategically missing the analysts' earnings estimates (Bova 2013). Firms may also choose to hold less cash (Klasa, Maxwell, and Ortiz-Molina 2009), issue more debt to increase the leverage (Bronars and Deere 1991; Matsa 2010; Myers and Saretto 2015), and conduct more asset sales (Lie and Que 2019).

Nonetheless, research investigating the effects of labor unions on firm operations is still scant and generates limited insights. In this study, we focus on one important aspect of firm operation, namely inventory management, and intend to shed further light on the effects of labor unions on firm inventory management. Inventory management is an important intermediate step in production, which has a strong effect on firm performance (Chen, Frank, and Wu 2005; Capkun, Hameri, and Weiss 2009; Eroglu and Hofer 2011; Isaksson and Seifert 2014). Existing research has identified various determinants of investment in inventories, such as access to liquidity (Kashyap, Lamont, and Stein 1994), internal finance (Carpenter et al. 1994), capital intensity and sales surprise (Gaur, Fisher, and Raman 2005), sales growth rate (Gaur and Kesavan 2015), and cost of equity (Dasgupta, Li, and Yan 2019). Our study thus extends this line of research by examining whether and to what extent labor unions may affect firm inventory management.

One hypothesis posits that unionizations may reduce firm investment in inventory. Labor unions tend to increase firms' fixed labor costs due to demand for higher wages and job security (Chen, Kacperczyk, and Ortiz-Molina 2011). From the cost-management perspective, firms may choose to reduce the inventory level because inventory is less expensive and less time-consuming to adjust (Carpenter et al. 1994). In addition, labor unions often intervene in the restructuring of firm physical capital, which reduces firm operating flexibility (Chen,

Kacperczyk, and Ortiz-Molina 2011). Thus, firms may resort to the improvement of inventory turnover to offset such inefficiency. Moreover, the formation of the unions may add another layer of financial constraints to the firm (He, Tian, and Yang 2016), which forces the firms to reduce inventory to free up some internal capital for future investment opportunities. Overall, this hypothesis predicts that after the passage of the union elections, firms choose to reduce the inventory level in the short term.

The competition hypothesis states that firms may choose to stockpile inventories to gain bargaining power over unions. Firms cannot stop employees from forming a collective bargaining unit, but they can take certain actions to countervail the influences of labor unions. Those actions range from utilizing strategic accounting policies (DeAngelo and DeAngelo 1991; Bowen, DuCharme, and Shores 1995; Hamm, Jung, and Lee 2018) to adopting specific financial decisions (Bronars and Deere 1991; Klasa, Maxwell, and Ortiz-Molina 2009; Matsa 2010; Myers and Saretto 2015). In this sense, firms can strategically reduce their cash holding (Klasa, Maxwell, and Ortiz-Molina 2009) and make investment in inventories to shield against union rent-seeking. More important, unions frequently use labor strikes as a weapon in the collective bargaining process. Holding sufficient inventories, especially in the form of finished goods, may allow firms to reduce future strike risks.

We are not the first to explore the link between unionization and firm inventory management. For example, Cullinan and Knoblett (1994) find no significant differences in the choice of inventory policy for unionized firms in all industries. Hamm et al. (2018) find that managers in manufacturing industries have more incentive to stockpile inventories in response to concerns of strikes due to stronger unions. Our study differs from their papers in that we directly examine the union election votes and adopt a regression discontinuity design to draw causal inferences.

DATA, SAMPLE, AND MEASURES

We construct our sample using several databases. We obtain the union election data in the 1980–1999 time span from Professor Thomas J. Holmes’s website,¹ and we retrieve union election data in the 1999–2010 time span from the NLRB website. The union election data provide details including the company name, industry, election date, total number of votes, and number of votes for the union. We carefully merge two sets of data and match union firms to Compustat firms using the names, election dates, and industries (Lee and Mas 2012). We require our sample union elections to have available election results and at least 100 voters. For firms with multiple election records, we retain the first one (Bradley, Kim, and Tian 2016). Following the convention in corporate finance research, we exclude financial firms (SIC 6000–6999) and utility companies (SIC 4900–4999) because these firms operate in highly regulated industries. Our final sample consists of 823 elections from 1980 to 2010. Table 1 reports the distribution of elections by year and by one-digit SIC code.

The main dependent variable is the inventory scaled by sales (Alessandria, Kaboski, and Midrigan 2010), demeaned by the industry and year average inventory level to adjust for the variations among industries and years. It measures

¹http://users.econ.umn.edu/~holmes/data/geo_spill/

TABLE 1. Distributions of Unionization Election by Year and Industry

Election Year	Number of Union Elections	Rate of Union Elections Win
1978	66	0.29
1979	74	0.27
1980	68	0.15
1981	43	0.23
1982	21	0.29
1983	20	0.35
1984	21	0.24
1985	32	0.22
1986	26	0.35
1987	21	0.29
1988	30	0.23
1989	26	0.12
1990	20	0.35
1991	13	0.08
1992	19	0.05
1993	20	0.35
1994	25	0.24
1995	19	0.32
1996	31	0.10
1997	19	0.37
1998	19	0.21
1999	25	0.24
2000	21	0.24
2001	21	0.38
2002	20	0.20
2003	17	0.35
2004	16	0.19
2005	16	0.25
2006	17	0.35
2007	7	0.57
2008	10	0.30
2009	9	0.33
2010	11	0.55
1 Digit SIC Code	Number of Union Elections	Rate of Union Elections Win
1	10	0.20
2	266	0.26
3	345	0.27
4	25	0.24
5	115	0.18
7	37	0.35
8	17	0.41
9	8	0.00

the extent to which a firm's inventory-to-sales ratio is above or below the average industry level in a specific year (Chen, Frank, and Wu 2005).

We construct two variables related to union elections. *Union votes* is the number of votes for unionization divided by the total number of votes in an election. *Passage* is the election result dummy which equals 1 when the *union votes* is greater than 50% and 0 otherwise (Bradley, Kim, and Tian 2016).

We include a set of variables to capture various aspects of firm characteristics (Chen, Kacperczyk, and Ortiz-Molina 2011; Isaksson and Seifert 2014). *Total assets* is measured as the natural logarithm of the firm total book assets. *Profitability* is the income before extraordinary items scaled by the total assets. *Tobin's q* is the natural logarithm of the market value of firm assets scaled by the book value of firm assets. *Leverage* is the ratio of firm book debt to total book assets. All the variables are winsorized at 1% and 99% to mitigate the concern of extreme values. Table 2 reports the summary statistics of the main variables used in regression analysis. Note that, for our sample union elections, on average 42% of participants in the election are in favor of unionization. The election passage rate is 25%, which suggests that about one-fourth of elections in our sample results in a union formation. Those voting percentages and results are consistent with previous studies (e.g., Qiu and Shen 2017; DiNardo and Lee 2004; He, Tian, and Yang 2016) and others.

RESULTS

Identification Strategy: A Regression Discontinuity Approach

In this study, we intend to test whether and to what extent the labor unions may affect firm inventory investment by treating the union elections as an event. Endogeneity concern arises if unobserved variables simultaneously influence the passage of union elections and firm decisions on inventory investment. Therefore, ordinary least squares (OLS) estimates can be biased due to the omitted variable problem. To address the endogeneity problem and make causal inferences, we adopt a regression discontinuity approach. The fundamental idea of the RD approach is that firms just below the cutoff (lose the union election by

TABLE 2. Summary Statistics

Variable	N	Mean	Standard Deviation	P25	P50	P75
Union votes	823	0.42	0.20	0.29	0.38	0.51
Passage	823	0.25	0.44	0.00	0.00	1.00
Inventory	823	0.16	0.10	0.10	0.15	0.22
Total assets	823	4543	13258	149	675	2938
Sales	823	5019	11639	223	980	3836
Profitability	823	0.04	0.07	0.02	0.05	0.08
Tobin's q	796	1.33	0.57	0.96	1.18	1.49
Leverage	822	0.30	0.18	0.16	0.27	0.40

Notes: This table reports the summary statistics for all the variables. *Union votes* is the percentage of the votes for the union. *Passage* is a dummy which equals 1 when union votes are greater than 50% and 0 otherwise. *Inventory* is the ratio of inventory scaled by sales. *Total assets* and *Sales* are the firm's total assets and sales in raw numbers. *Profitability* is the income before extraordinary items scaled by the total assets. *Tobin's q* is the ratio of the market value of equity to the book value of equity. *Leverage* is the ratio of total debt to total assets.

a small voting share) are good comparisons to those just above the cutoff (win the union election by a small voting share) (Lee and Lemieux 2010). Observations within a small window around the cutoff are as good as randomized (Lee 2008). In our settings, firms within a small window around the 50% vote threshold should have similar observable and unobservable characteristics, except the status of union passage, and the difference of outcomes (inventory) reveals the causal effects of union passage (Cattaneo, Titiunik, and Vazquez-Bare 2019).

Tests on RD Design Assumptions

The RD research design has two important assumptions. The first assumption is that all of the parties involved in the votes cannot precisely manipulate the number of votes near the cutoff point (Lee and Lemieux 2010). We perform three tests on the validity of this assumption. Figure 1 shows the histogram of the voting results of union elections. We do not see an obvious discontinuity around the 50% threshold, which suggests that there is no precise manipulations around the cutoff. We then perform a manipulation test proposed by Cattaneo, Jansson, and Ma (2019), and report our results in Table 3. For all three different band-

FIGURE 1. Distribution of Union Votes

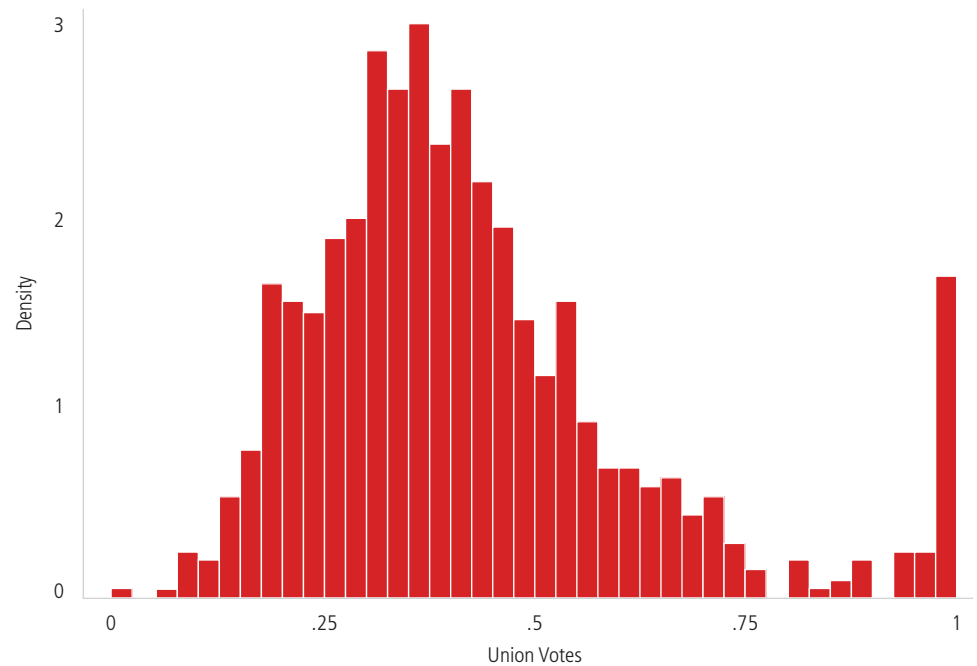


TABLE 3. Density Tests of Votes on Unionization

Density Tests Setting	Bandwidth Left	Bandwidth Right	Density Test p -Value
Unrestricted, Different Bandwidth	0.10	0.11	0.22
Unrestricted, Same Bandwidth	0.10	0.10	0.17
Restricted, Same Bandwidth	0.19	0.19	0.74

Notes: This table reports the results of Cattaneo, Jansson, and Ma (2019) density tests on union votes under three regression discontinuity settings. The null hypothesis is that the running variable is continuous at the cutoff. The second and third columns show the MSE-Optimal bandwidth selected for the tests. The last column shows the testing p -value.

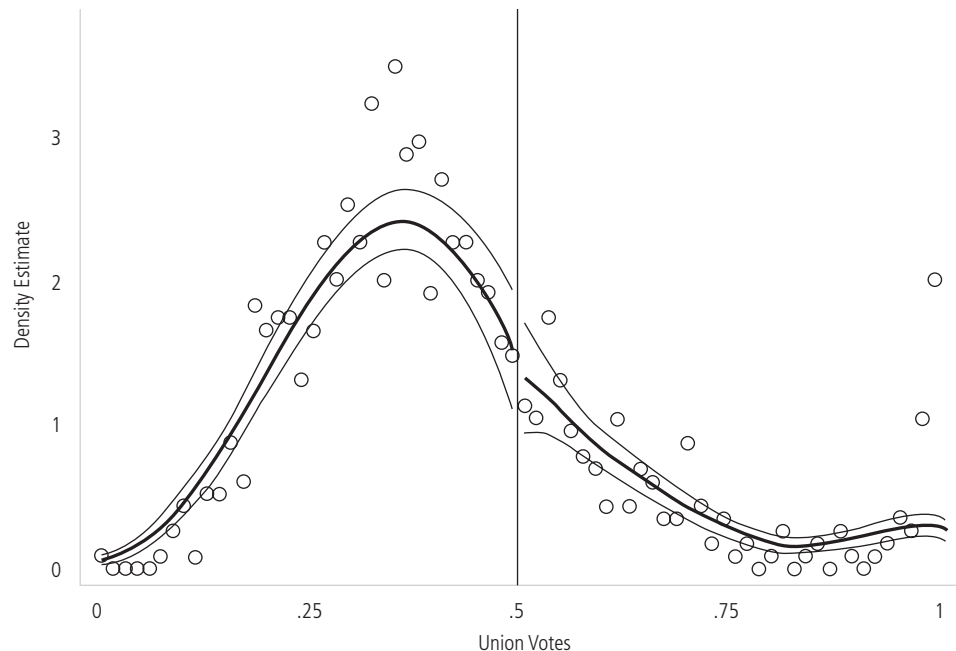
width choices, the results fail to reject the null hypothesis of no manipulation. We also conduct the McCrary (2008) density test. In particular, Figure 2 shows the estimated density, where the x-axis is the *union votes* and the y-axis shows the estimated density. The thick line is the fitted density function of the running variable; and the thin lines present the 95% confidence interval. From the plot, we observe a relatively continuous density line on the left and right of the cutoff. The discontinuity estimate is -0.04 with a standard error of 0.23 , which fails to reject the null hypothesis of no manipulation as well.

The second assumption of RD design posits that other variables should be continuous around the cutoff. We test the differences of other firm financials between firms with successful union elections and firms with unsuccessful union elections within a small range. Panel A of Table 4 shows the comparison of voting results for two groups of firms within the range of 48% to 52%, and confirms that they have no significant differences in terms of firm financials. Panel B of Table 4 further confirms that other firm financials have no significant discontinuity in the pre-election period.

Global Polynomial RD

We implement a series of global polynomial RD estimations that utilize all the observations with higher-order terms of *union votes*. It also allows for separate estimations for the observations on the left and the right of the threshold. We choose the quadratic polynomials model because higher-order polynomials may suffer from problems such as noisy estimates, sensitivities to the degree of the polynomial, or poor coverage of confidential intervals (Gelman and Imbens 2019). We include the control variables for firm financials, year fixed effects, and industry fixed effects, and report our results in Table 5. For the sake of brevity,

FIGURE 2. McCrary (2008) Density Plot



ty, we do not report the coefficients of *union votes* and control variables. The coefficients of *passage* are significantly negative across all model specifications. In other words, *ceteris paribus*, the successful union elections have a negative effect on firm inventories. Furthermore, the negative effect holds for both the union election year and one year after union election. Figure 3 is a graphical illustration of the effects of labor unions on firm inventory investment under the

TABLE 4. Tests of Continuity Assumptions

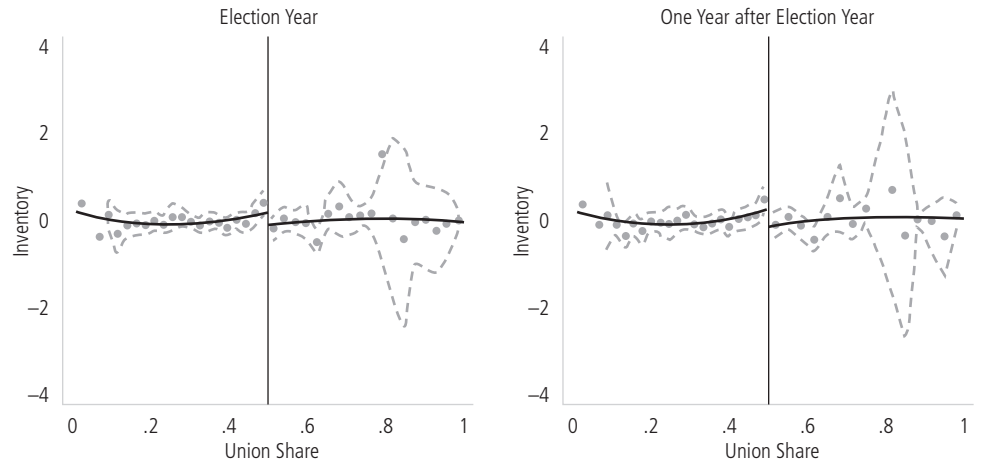
Panel A: Comparison of Firms with Union Votes between 48% and 52%				
Variable	Passage = 0	Passage = 1	Difference	p-Value
Total assets	5.70	6.14	−0.44	0.45
Sales	6.04	6.58	−0.53	0.35
Profitability	0.04	0.04	0.01	0.63
Tobin's q	0.79	0.77	0.03	0.67
Leverage	0.31	0.32	−0.01	0.91
Panel B: Discontinuity Tests on Predetermined Variables				
Pre-Election Variable	MSE-Optimal Bandwidth	Effective Number of Observations	RD Estimator	p-Value
Inventory	0.10	242	−0.04	0.12
Total assets	0.12	291	0.65	0.22
Sales	0.09	228	0.68	0.23
Profitability	0.08	206	−0.01	0.32
Tobin's q	0.08	197	−0.05	0.28
Leverage	0.10	241	0.09	0.17

Notes: Panel A compares the observable characteristics between unionized and nonunionized firms by a small margin. Panel B reports the regression discontinuity results on variables in the pre-election year. Inventory is adjusted by industry and year average. Total assets, sales, and Tobin's q are taken as natural logarithms due to their skewness.

TABLE 5. Global Polynomial Regression Discontinuity Estimation

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Inventory ($t = 0$)			Inventory ($t = 1$)		
Passage	−0.026*	−0.026*	−0.025*	−0.032*	−0.033**	−0.031*
	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)
Observations	823	823	796	763	763	740
R-squared	0.006	0.008	0.010	0.011	0.012	0.022
Polynomial	2	2	2	2	2	2
Year and Industry FE	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes

Notes: This table reports the results of quadratic global polynomial regression discontinuity estimation. The dependent variable is the inventory-to-sales ratio adjusted by the industry and year average. $t = 0$ refers to the election year, and $t = 1$ refers to the first year after the election year. Only the coefficients of *passage* are reported for brevity. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

FIGURE 3. Global Polynomial RD Plots on Inventory

quadratic global polynomial approach. Nonetheless, global polynomial RD is subject to a few concerns. For example, in addition to the concern regarding the choice of the degree of polynomial (Gelman and Imbens 2019), the inclusion of observations far from the cutoff in global polynomial may introduce bias (He, Tian, and Yang 2016) and result in poor estimations at the boundary points (Cattaneo, Idrobo, and Titiunik 2019).

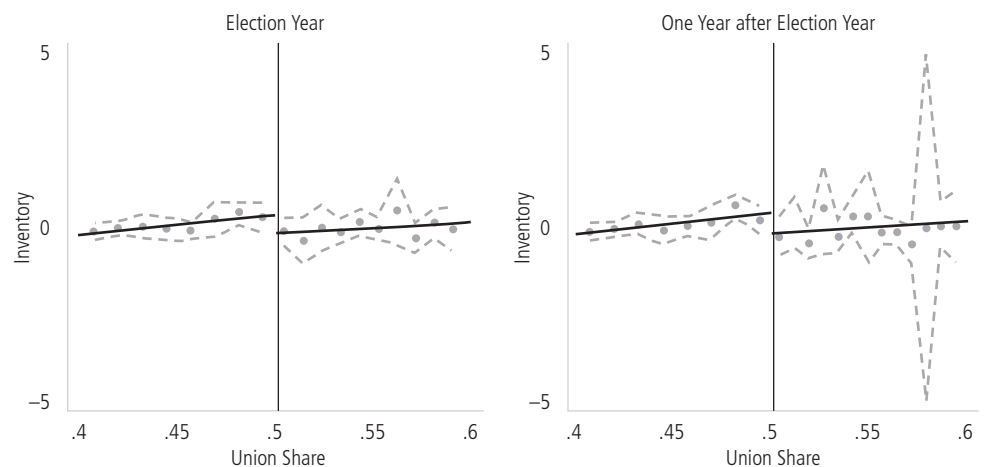
Local Linear RD

In this section, we implement a nonparametric local linear RD approach to address the abovementioned concerns in global polynomial RD, which focuses on a small window around the 50% voting threshold. Another advantage of local RD is that it is unnecessary to include the explanatory variables in the regression to obtain consistent estimates (Lee and Lemieux 2010). In our RD settings, we use both the triangular and uniform (rectangular) kernels. We also use two different data-driven methods for bandwidth selection, with one minimizing the mean squared error (MSE-Optimal) (Imbens and Kalyanaraman 2012) and one minimizing the coverage error of confidential intervals (CER-Optimal) (Cattaneo, Idrobo, and Titiunik 2019). Table 6 reports the estimation results based on the local linear RD approach. Using various bandwidths and kernel settings, we find that labor unions have a significant and negative effect on firm inventory levels for the election year and one year after the election. Using the average inventory-to-sale level as the benchmark, we find that the inventory-to-sale ratio is 6% lower in the election year and at least 7% lower in one year after the election. Overall, these results, along with the global polynomial RD results, suggest a negative effect of unionization on firm investment in inventories. Figure 4 illustrates the effects of labor unions under the settings of the triangular kernel and MSE-Optimal bandwidth selections. Each dot represents the mean of observations within the evenly spaced bin. The solid line is the fitted linear estimates, and the dashed lines indicate the 95% confidence interval. We observe an obvious drop in inventory levels from the left side to the right side of the 50% union vote percentage.

TABLE 6. Local Linear Regression Discontinuity Estimation Results

	(1)	(2)	(3)	(4)
	Inventory ($t = 0$)		Inventory ($t = 1$)	
Kernel	Triangular	Uniform	Triangular	Uniform
Panel A: MSE-Optimal Bandwidth Selection				
Passage	−0.066***	−0.060**	−0.074***	−0.084***
	(0.025)	(0.026)	(0.027)	(0.028)
Bandwidth Left	0.10	0.08	0.10	0.07
Bandwidth Right	0.10	0.08	0.10	0.07
Effective Obs. Left	170	115	161	100
Effective Obs. Right	89	76	80	62
Panel B: CER-Optimal Bandwidth Selection				
Passage	−0.072***	−0.085***	−0.086***	−0.094***
	(0.027)	(0.028)	(0.029)	(0.031)
Bandwidth Left	0.07	0.05	0.07	0.05
Bandwidth Right	0.07	0.05	0.07	0.05
Effective Obs. Left	109	80	104	67
Effective Obs. Right	72	59	64	50

Notes: This table reports the results of local linear regression discontinuity estimation. The dependent variable is the inventory-to-sales ratio adjusted by the industry and year average. $t = 0$ refers to the election year, and $t = 1$ refers to the first year after the election year. The triangular kernel is used in column 1 and column 3 and the uniform kernel is used in column 2 and column 4. Panel A reports the results using the MSE-Optimal bandwidth and Panel B reports the results using the CER-Optimal bandwidth. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

FIGURE 4. Local Linear RD Plots on Inventory

Robustness Checks

In this section, we conduct a host of robustness checks to ensure the validity of our findings. First, we use artificial cutoffs instead of the 50% and rerun the local RD regressions. Specifically, we use artificial cutoffs ranging from 40% to

60% stepped by 5% each time and expect to see no treatment effects other than at the real cutoff. In Table 7, we present the local RD estimates with each placebo cutoff for inventory ratio in the election year and one year after the election using the triangular kernel and MSE-Optimal bandwidth. As we expected, only the real cutoff provides a significant treatment effect. The placebo cutoff tests under other local RD settings show similar results.

Next, we use a similar approach that examines the sensitivity of our previous finding on different lengths of bandwidth. The choice of bandwidth is a trade-off between precision and bias. Wider bandwidth provides more accurate estimates from more observations but brings more misspecification error, while narrower bandwidth reduces the bias from linear specification but tends to raise the variation (Bradley, Kim, and Tian 2016; Cattaneo, Idrobo, and Titiunik 2019). In addition to the MSE-Optimal and CER-Optimal bandwidths in our base regression, we manually assign the bandwidth to be 75% and 125% of the MSE-Optimal bandwidth, and 75% and 125% of the CER-Optimal bandwidth, as recommended by Campello et al. (2018). Untabulated results show that the effects of union election on inventory are robust to those artificial bandwidths.

Exploring Underlying Mechanisms

Our findings that the union election reduces a firm's inventory level are consistent with the first hypothesis we propose. In this section, we further examine the underlying mechanisms of union influences.

TABLE 7. Local Linear Regression Discontinuity Results with Artificial Cutoffs

Artificial Cutoffs	Bandwidth	RD Estimator	Robust S.E.	Effective Number of Observations
Inventory ($t = 0$)				
40%	0.04	0.04	0.03	162
45%	0.02	0.02	0.05	76
50%	0.10	-0.07***	0.02	259
55%	0.07	-0.02	0.04	99
60%	0.06	-0.04	0.04	79
Inventory ($t = 1$)				
40%	0.04	0.05	0.03	143
45%	0.02	0.04	0.06	75
50%	0.10	-0.07***	0.03	241
55%	0.07	0.00	0.04	93
60%	0.06	-0.03	0.04	74

Notes: This table reports the results of local linear regression discontinuity estimation with different cutoffs. The dependent variable is the inventory-to-sales ratio adjusted by the industry and year average. $t = 0$ refers to the election year and $t = 1$ refers to the first year after the election year. The triangular kernel and MSE-Optimal bandwidth are used in the estimation. The results are similar when using other settings. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Firm Labor Costs

One of the direct results of the passage of union elections is the rising labor costs. As we discussed in the literature review section, firms may choose to decrease inventory levels because it is easier and less costly to adjust and restore compared to other types of capital (Carpenter et al. 1994). Therefore, firms with higher costs of goods sold would have more incentives to change their inventory policy after a union election since the labor costs' shock would be stronger for those firms already having a higher costs level. The high cost of goods sold also provides more room for future cost control for such firms. We use the gross margin to measure the cost pressure that firms are facing before union elections. The gross margin is calculated as the difference between sales and cost of goods sold scaled by the sales. Lower gross margin indicates higher costs related to the goods sold.

The results are reported in Panel A of Table 8. We assign firms to the subsample of high costs if their industry and year adjusted gross margin is below the 30th percentile and to the subsample of low costs if above the 70th percentile. The results are consistent with our expectation that firms with high costs before the union election experience a significant drop in inventory. Firms with low costs are less affected by the union formation, probably due to their ability to absorb the shock without the need to alter the inventory.

Operating Flexibility

Labor unions tend to tighten firm operating flexibility by making wages sticky and imposing difficulties for firms to lay off workers (Chen, Kacperczyk, and Ortiz-Molina 2011). Unions are more likely to intercede the firms' intention to adjust physical capital. Therefore, it is plausible that firms with less operating flexibility are more likely to reduce inventories because significant inventory costs may worsen the operating flexibility in the event of successful union elections (Raturi and Singhal 1990).

We follow Mandelker and Rhee (1984) and Chen, Kacperczyk, and Ortiz-Molina (2011) to estimate the operating leverage as the elasticity of a firm's operating income with respect to its sales using the most recent 12 quarterly data before the union election. Higher operating leverage indicates lower operating flexibility. Similar to the labor costs section, we construct subsamples based on whether a firm's pre-election operating leverage falls into the upper or lower 30th percentile range. The local RD results are presented in Panel B of Table 8. Our findings suggest that firms with low operating flexibility significantly adjust inventory levels after the passage of union elections.

Financial Constraints

Dasgupta, Li, and Yan (2019) argue that firms show different inventory behaviors when they are financially constrained. Facing an unfavorable cost shock, financially constrained firms are more likely to liquidate inventory in the short run since other types of capital are costly to adjust and it takes time to rebuild for such firms. Thus, as successful union elections put more pressure on rising labor costs, we expect that firms that are already in tight financial situations have more incentives to reduce their inventory level to free up capital for future investment opportunities.

TABLE 8. Underlying Mechanism

	(1)	(2)	(3)	(4)
Panel A: Subsample by Gross Margin				
	High Costs (Gross Margin < P30)		Low Costs (Gross Margin > P70)	
Variable	Inventory ($t = 0$)	Inventory ($t = 1$)	Inventory ($t = 0$)	Inventory ($t = 1$)
Passage	−0.119** (0.053)	−0.098** (0.047)	−0.056 (0.059)	−0.030 (0.064)
Bandwidth Left	0.091	0.127	0.090	0.096
Bandwidth Right	0.091	0.127	0.090	0.096
Effective Obs. Left	20	32	60	61
Effective Obs. Right	26	27	23	21
Panel B: Subsample by Operating Flexibility				
	High Operating Flexibility (Operating Leverage < P30)		Low Operating Flexibility (Operating Leverage > P70)	
Variable	Inventory ($t = 0$)	Inventory ($t = 1$)	Inventory ($t = 0$)	Inventory ($t = 1$)
Passage	−0.003 (0.041)	−0.026 (0.052)	−0.112*** (0.039)	−0.102** (0.040)
Bandwidth Left	0.179	0.161	0.105	0.150
Bandwidth Right	0.179	0.161	0.105	0.150
Effective Obs. Left	107	86	50	81
Effective Obs. Right	33	28	21	21
Panel C: Subsample by Financial Constraints				
	Financially Constrained (Total assets < P30)		Financially Unconstrained (Total assets > P70)	
Variable	Inventory ($t = 0$)	Inventory ($t = 1$)	Inventory ($t = 0$)	Inventory ($t = 1$)
Passage	−0.120*** (0.038)	−0.128*** (0.047)	−0.067 (0.044)	−0.058 (0.041)
Bandwidth Left	0.104	0.094	0.104	0.116
Bandwidth Right	0.104	0.094	0.104	0.116
Effective Obs. Left	55	44	49	57
Effective Obs. Right	24	20	27	27

Notes: This table reports the results of local linear regression discontinuity estimation with different subsamples. The dependent variable is the inventory-to-sales ratio adjusted by the industry and year average. $t = 0$ refers to the election year and $t = 1$ refers to the first year after the election year. The triangular kernel and MSE-Optimal bandwidth are used in the estimation. The results are similar when using other settings. Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Following prior literature, we categorize firms to be financially constrained if their pre-election total assets are within the bottom 30th percentile and to be financially unconstrained if within the top 30th percentile. We separately examine the unionization effect on inventory for those two subsamples of firms and present results in Panel C of Table 8. Consistent with our expectations, the negative unionization effects are intense among financially constrained firms. In untabulated RD regressions, we find similar results based on different financial constraints measures (Whited and Wu 2006; Hadlock and Pierce 2010).

Labor Unions and State Labor Rights

In this section, we investigate how state laws related to employee rights may affect the negative relation between unionization and firm inventor investment. We focus on two labor laws that have been widely discussed in the literature (John, Knyazeva, and Knyazeva 2015). The first labor law is the right-to-work (RTW) statute, which allows employees to enjoy the union benefits without joining the union (Bradley, Kim, and Tian 2016). Thus, RTW results in a “free-rider” problem and reduces the union’s bargaining power (Holmes 1998; Matsa 2010). The passage of RTW is considered to weaken the union power and state labor rights. We obtain the year each state adopted the RTW statute from the Department of Labor. The second legislation related to state labor rights is the wrongful discharge law (WDL) that protects employees from unjust discharge by employers (Autor, Donohue, and Schwab 2004). There are three common exceptions in WDL, namely, implied contract, public policy, and good faith exceptions. Passing WDL in a state is conducive to a pro-labor movement. We acquire the year that each state passes any of those exceptions from Autor, Donohue, and Schwab (2006).

As suggested by John, Knyazeva, and Knyazeva (2015), we consider a state to have strong labor rights if it has at least one of the WDL exceptions or does not adopt the RTW statute. Firms in states with strong labor rights are expected to have leaner inventory after unionization because unions are more likely to influence the operation and performance of firms in those states. We construct subsamples based on the strength of state labor rights at the time of union elections and re-run our local RD analysis. Consistent with our expectation, the results reported in Table 9 indicate that the effects of labor unions on inventory are stronger for our sample firms located in states with stronger labor rights.

Labor Unions and Firm Labor Intensity

The negative relation between unionization and inventory investment may also be contingent on the firm’s labor intensity. Labor-intensive firms rely more on human capital in their operations, which allows the unions to acquire more bargaining power (Hilary 2006; John, Knyazeva, and Knyazeva 2015). As a result, such firms would face high labor-adjustment costs and substantial union influences after successful union elections. Therefore, we expect to observe a stronger effect of labor unions on inventory investment for firms with higher labor intensity.

Following existing research (Hamm, Jung, and Lee 2018), we calculate labor intensity as the total number of employees scaled by total assets. A firm belongs to the high or low labor-intensive subsample if its industry- and year-adjusted labor intensity before union election is in the top or bottom 30th percentile. We run our local linear RD regression for the two subsamples and report the results in Table 10. In line with our expectation, we observe significantly negative RD estimates for firms with high labor intensity, but not for firms with low labor intensity. Our findings suggest that the labor unions have a stronger effect on firms that rely more on human capital.

TABLE 9. Unionization and State Labor Rights

	(1)	(2)	(3)	(4)
	States with Strong Labor Rights		States with Weak Labor Rights	
Variable	Inventory ($t = 0$)	Inventory ($t = 1$)	Inventory ($t = 0$)	Inventory ($t = 1$)
Passage	-0.064** (0.027)	-0.077** (0.030)	-0.039 (0.041)	-0.043 (0.042)
Bandwidth Left	0.107	0.105	0.140	0.141
Bandwidth Right	0.107	0.105	0.140	0.141
Effective Obs. Left	146	133	48	46
Effective Obs. Right	78	67	19	19

Notes: This table reports the results of local linear regression discontinuity estimation for firms from states with different levels of labor rights legislation. The dependent variable is the inventory-to-sales ratio adjusted by the industry and year average. $t = 0$ refers to the election year and $t = 1$ refers to the first year after the election year. The triangular kernel and MSE-Optimal bandwidth are used in the estimation. The results are similar when using other settings. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The Effects of Labor Unions on Operating Efficiency

Our previous findings suggest that union wins are associated with lower inventory levels. In this section, we examine how the reduced inventory levels change the firm's business efficiency. Specifically, we focus on the net operating cycle (NOC) or cash conversion cycle that calculates the time between paying for inventory and collecting the cash for selling the inventory. Shorter NOC indicates that firms collect cash from the sale of inventory more efficiently. NOC equals the sum of days of inventory outstanding (DIO) and days of sales outstanding (DSO) subtracting the days of payable outstanding (DPO). Following Dechow (1994) and others, we calculate DIO as 360 times the average inventory scaled by the cost of goods sold, DSO as 360 times the average accounts receivables scaled by sales, and DPO as 360 times the average accounts payable scaled by the

TABLE 10. Unionization and Firm Labor Intensity

	(1)	(2)	(3)	(4)
	High Labor Intensity (Number of Employment/Assets > P70)		Low Labor Intensity (Number of Employment/Assets < P30)	
Variable	Inventory ($t = 0$)	Inventory ($t = 1$)	Inventory ($t = 0$)	Inventory ($t = 1$)
Passage	-0.163** (0.080)	-0.184** (0.082)	-0.021 (0.060)	-0.072 (0.062)
Bandwidth Left	0.076	0.073	0.094	0.089
Bandwidth Right	0.076	0.073	0.094	0.089
Effective Obs. Left	36	35	40	31
Effective Obs. Right	27	23	23	19

Notes: This table reports the results of local linear regression discontinuity estimation for firms with high and low labor intensity. The dependent variable is the inventory-to-sales ratio adjusted by the industry and year average. $t = 0$ refers to the election year and $t = 1$ refers to the first year after the election year. The triangular kernel and MSE-Optimal bandwidth are used in the estimation. The results are similar when using other settings. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

cost of goods sold. In Table 11, we examine the union effects on both the NOC and its three components. From the first two columns, we observe significantly negative coefficients, indicating that firms enhance their operating efficiency after the union wins. In addition, the results from columns 3 to 8 suggest that the efficiency improvements are mainly from speeding up the inventory turnover. Our findings are consistent with the first hypothesis that firms have a positive response to the union wins.

The Effects of Labor Unions on the Sources of Finance for Inventories

Inventory literature generally identifies two commonly used sources to finance inventory, namely trade credit and bank credit (Buzacott and Zhang 2004). We argue that labor union shifts firms' inventory sourcing from bank credit to trade credit for two reasons. First, the operating inflexibility caused by unionization may further induce an increase in the firm's risks such as the default risk and delayed payments due to disappointing sales (Chen, Kacperczyk, and Ortiz-Molina 2011). Trade credit indeed provides a channel between retailers and their suppliers to share those demand risks (Yang and Birge 2018). Also, prior studies find that suppliers are often inclined to offer trade credit to their customers in trouble to maintain the future business (Wilner 2000; Cuñat 2007). Therefore, the unionization will encourage the firm to use trade credits with suppliers. Second, during difficult times, firms tend to substitute trade credit for bank borrowings due to the bank credit rationing (Petersen and Rajan 1997; Atanasova and Wilson 2004) and their financial constraints (Danielson and Scott 2004). Since union passage would add further financial constraints as we discussed in the literature review section, firms after union win would decrease the usage of financial credit either due to the increasing costs of financial distress or the rising difficulty to borrow more from banks. Consequently, firms may demonstrate less usage of bank financing.

TABLE 11. Unionization and Firm Operating Cycles

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variable	NOC ($t = 0$)	NOC ($t = 1$)	DIO ($t = 0$)	DIO ($t = 1$)	DSO ($t = 0$)	DSO ($t = 1$)	DPO ($t = 0$)	DPO ($t = 1$)
Passage	-42.265**	-46.189**	-37.422***	-44.262***	-4.865	-1.435	-7.776*	-5.579
	(16.932)	(17.975)	(13.555)	(14.440)	(8.948)	(9.539)	(4.263)	(5.568)
Bandwidth Left	0.063	0.065	0.072	0.067	0.102	0.086	0.093	0.093
Bandwidth Right	0.063	0.065	0.072	0.067	0.102	0.086	0.093	0.093
Effective Obs. Left	85	88	104	97	165	125	148	143
Effective Obs. Right	68	60	71	60	88	70	85	76

Notes: Dependent variables in the first two columns are the net operating cycle, which equals the days of inventory outstanding plus the days of sales outstanding and minus days of payable outstanding. Dependent variables in column 3 and column 4 are the days of inventory outstanding calculated as 360 times average inventory scaled by total costs of goods sold. Dependent variables in column 5 and column 6 two columns are the days of sales outstanding, calculated as 360 times average accounting receivables scaled by sales. Dependent variables in the last two columns are the days of payable outstanding, calculated as 360 times the average accounting payable scaled by the costs of goods sold. $t = 0$ refers to the election year and $t = 1$ refers to the first year after the election year. All dependent variables are adjusted by industry and year average. The triangular kernel and MSE-Optimal bandwidth are used in the estimation. The results are similar when using other settings. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

We focus on the manufacturing, wholesale, and retailing business industries in this section not only because they contain the most observations of our sample, but more importantly, firms in those two industries often have to offer trade credit and favorable payment terms to survive in the business and stay competitive (Peura, Yang, and Lai 2017). Following Yang (2011), we measure trade credit as the accounts payable scaled by inventory level and bank credit as the short-term debt scaled by inventory level. We implement local RD tests on those two financing sources and report results in Table 12. Our results show that firms increase the usage of trade credit after the unionization and decrease the usage of bank credit one year after the unionization. These results are consistent with our expectation that unionization provides firms with incentives to shift the inventory financing source from bank credit to trade credit.

CONCLUSION

How do firms change inventory investment in response to the union election? Two competing hypotheses provide opposing predictions. Based on the union election data and RD approach, we find evidence that firms reduce inventory levels in the short run after winning union elections. This negative relationship is consistent in both the global polynomial and local linear RD estimates and robust to various RD settings. Leaner inventory leads to improvement in the operating efficiency, which offsets the disadvantage brought by the unions. Moreover, the effects of labor unions on firm inventory investment are more prominent for firms located in states with stronger labor rights and that are more labor-intensive. The operation inflexibility and financial constraints caused by union elections make firms reduce bank credit and increase the use of trade credit. In sum, our findings reveal a positive reaction of firms on the unionizations.

We believe that our paper makes several contributions to the literature. First, we expand the unionization literature and show how the passage of union elections changes the firm's inventory behaviors. Previous research focused on the influence of unionization on firm performance and how firms enhance their

TABLE 12. Unionization and Sources of Inventory Financing

	(1)	(2)	(3)	(4)
Variable	Trade Credit ($t = 0$)	Trade Credit ($t = 1$)	Bank Credit ($t = 0$)	Bank Credit ($t = 1$)
Passage	0.239** (0.104)	0.281*** (0.105)	-0.203 (0.128)	-0.295** (0.143)
Bandwidth Left	0.153	0.164	0.103	0.090
Bandwidth Right	0.153	0.164	0.103	0.090
Effective Obs. Left	252	248	149	115
Effective Obs. Right	103	96	77	61

Notes: Dependent variables in the first two columns are the trade credit (account payable) scaled by the inventory level. Dependent variables in the last two columns are the bank credit (short-term debt) scaled by then inventory level. $t = 0$ refers to the election year and $t = 1$ refers to the first year after the election year. All dependent variables are adjusted by industry and year average. The triangular kernel and MSE-Optimal bandwidth are used in the estimation. The results are similar when using other settings. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

bargaining power. Our findings illustrate that union pressures lead firms to be more inclined to leaner inventory policy. Second, we contribute to the inventory management literature by providing evidence that unionization is another factor shaping corporate inventory investments. Our results also confirm that reducing inventory helps to mitigate operational costs and inefficiencies. With the operational shocks, firms rely more on trade credit than bank credit to finance their inventory. Finally, we employ the RD approach to build a causal relationship and alleviate potential endogeneity concerns. Conventional OLS regression between union and inventory suffers from omitted variable concern in which some unobservable variables may simultaneously correlate with the unionization and inventory decision. There are also reversed causality concerns that employees in firms with higher inventory may be more likely to vote for a union election. RD design mitigates such concerns by employing a local comparison where the passing of election is close to a random effect.

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Consumer Values and Misbehavior in the Context of Sustainable Consumption

Sławomir Smyczek

Abstract

Motivation: An extremely important stream of research on sustainable consumption relates to the values that consumers report as their own. The majority of research focuses on biological or utility values, but there are not many studies on social values, which are important for adapting sustainable consumption.

Premise: The question, “What values should represent consumers to accept ideas of sustainable consumption?” remains. In this study we applied a new approach, identifying consumer attitudes opposing sustainable consumption and measuring the correlation between consumers’ social values and misbehavior; that is, being at odds with the concept of sustainability.

Approach: A quantitative statistical investigation was conducted on a quota sample of 1,200 respondents, giving evidence of represented social values, and attitudes toward market misbehavior and sustainable consumption. By undertaking this research, social values were analyzed according to Schwartz’s theory.

Results: The purpose of this paper was to identify the relationship between consumers’ social values and their attitudes toward misbehavior in the context of sustainable consumption. Results show that in consumers who represent high levels of universalism, benevolence, or conservatism, a negative attitude toward misbehavior was identified. We can assume that consumers who represent those values are more willing to adopt the concept of sustainable consumption.

Conclusion: The results of this research contribute mainly to the development of theory-cognitive values. Findings demonstrate different aspects of consumer misbehavior by means of comprehensible components of social values. Results help predict consumer behavior under some specific values in the context of sustainable consumption.

Consistency: These findings may be applied in the practical operation of companies that want to develop business based on the sustainability concept. Knowledge of consumer values and attitudes is indispensable to the development of marketing programs and strategies, and to the creation of methods to prevent and counteract different consumers’ misbehavior.

Keywords: consumer attitudes, consumer behavior, misbehavior, social values, sustainable consumption

JEL Classification Codes: D11, D12, E21

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INTRODUCTION

The phenomenon of sustainable consumption refers directly to the concept of sustainable development (Harrison 2005). It is a complex category and a subject of interest to various scientific disciplines, international organizations, and state institutions. According to the Organisation for Economic Co-operation and Development (OECD) (1992), sustainable consumption is the use of goods and services that meet basic needs and improve the quality of human life, while using natural resources, avoiding toxic materials and emissions from waste and contaminants during the life cycle, so as to not deprive the needs of future generations.

We can look at sustainable consumption from two perspectives: macro and micro. Sustainable consumption analyzed in the macroeconomic perspective takes into account mainly issues of the place of consumption (Di Giulio et al. 2014), sustainable consumption policy (Reisch and Thøgersen 2017), as well as its tools and indicators (Polonsky et al. 2014). However, the macroeconomic approach does not refer to issues related to consumer behavior. The second approach, the microeconomic perspective, is part of the trend in research on consumer behavior. Initially, only ecological consumer behavior—green, pro-ecological consumption—was examined in this approach (Straughan and Roberts 1999). Later the interest of researchers extended to the social aspect of sustainability, which resulted in the analysis of ethical behavior and ethical consumption (Cherrier 2007), leading to the term *sustainable behavior* (Szmiagin, Carrigan, and McEachern 2009). Research carried out in this trend focuses mainly on the assessment of consumer awareness (McDonald and Oates 2006), on their pro-ecological and ethical attitudes (Peattie and Peattie 2009), and on explaining the problem of non-compliance of real behaviors to declared attitudes (Shaw, McMaster, and Newholm 2015).

Currently, this extremely important stream of research on sustainable consumption relates to the values that consumers report represent themselves and the attitudes of consumers toward sustainable consumption. The research is not limited to biological or utility values, but includes social values, which are important in the adoption of sustainable consumption. This research trend is consistent with the concept of sustainable development, according to which, in the process of sustainable development, not only material development is important, but also intellectual and spiritual development. The question, “Which values represent consumers who accept ideas of sustainable consumption?” remains. And even more important, “Which consumer values are more associated with sustainable consumption and which ones oppose it?” The best way to identify attitudes opposing sustainable consumption is to measure the correlation between consumer social values and misbehavior—behavior at odds with the concept of sustainability.

The purpose of this paper was to identify a relationship between consumer social values and their attitudes toward misbehavior in the context of sustainable consumption. The research was conducted by means of a questionnaire distributed online to a group of 1,200 respondents from Poland. The paper starts with an introduction, followed by a theoretical background, methodology, and ending with an empirical section and conclusions. This paper is the result of research project number 2013/11/B/HS4/01470, financed by the National Science Centre from Poland.

SUSTAINABLE CONSUMPTION AND CONSUMER MISBEHAVIOR—THEORETICAL BACKGROUND

Sustainable consumption aroused great interest as soon as it appeared in public discourse at the end of the twentieth century. However, the consequences of this concept's growing popularity in subsequent years seem to elude an unequivocal assessment. On one hand, the incorporation of its principles in the European Union's sustainable development policy (Mazur-Wierzbicka 2006) and the accompanying educational activities have contributed to a significant increase in consumer awareness. On the other hand, the spreading fashion of sustainability has opened the door for many abuses and simplifications. Hoping for greater profits, some companies began to mischaracterize their products as ecological, which in the literature gained the name *green washing*. In turn, there is resignation from consumers who, guided by the *fashion for sustainability*, only pursue sustainable consumption in the declarative layer. Their declarative layer reveals the incompatibility of their attitudes and behaviors—the attitude-behavior gap. It is common to justify the actual lack of sustainability of one's own lifestyle by focusing on individual sustainable activities while overlooking other aspects of unsustainable consumption, e.g., engaging in segregating post-consumer waste without striving to reduce the amount of waste.

There are various approaches to sustainable consumption in the literature. According to one concept, achieving sustainability in consumption is only possible thanks to the improvement of efficiency obtained by new, innovative technological solutions that reach consumers through the market (Lorek and Fuchs 2013). Thus, the sustainable nature of consumption means qualitative changes in this approach and depends primarily on the supply side of the market—the availability of sustainable products and technologies, while not requiring any changes in consumption patterns (Laperche, Levratto, and Uzunidis 2012).

However, such changes, as well as the accompanying decrease in the level of consumption in economically developed countries, constitute the basic indicator of other approaches to sustainable consumption (Fuchs and Lorek 2005). This approach implements the postulate of introducing both qualitative and quantitative changes in the use of resources (Cohen 2011). In this broad sense (going beyond consumer consumption), sustainable consumption consists of reducing the consumption of depleting resources through their more efficient use, substituting renewable resources, limiting consumption of depleting resources, as well as limiting the consumption of renewable resources to a level that allows their continued reproduction (Lorek 2016).

Research on sustainable consumption shows important contributors aside from macro- and micro-economical aspects. For instance, ecological consumer behavior—green, pro-ecological consumption—was examined (Straughan and Roberts 1999). Researchers' interest extended to the social aspect of sustainability, which resulted in the analysis of ethical behavior and ethical consumption (Cherrier 2007), and publications began to use the term *sustainable behavior* (Szmigin, Carrigan, and McEachern 2009).

A phenomenon opposing ethical and sustainable behavior is *consumer misbehavior* (Albers-Miller 1999; Fullerton and Punj 1993; Vitell, Anusorn, and James 2001). Lovelock and Wirtz (2011), for example, describe consumer

misbehavior as senseless or improper, creating problems for companies, their personnel, and other consumers. Lovelock and Wirtz emphasize that companies can accept consumer complaints, yet, more importantly, they should manage the complaints in a more professional way when they are invalid.

Hoffman and Bateson (2010) refer to consumer misbehavior while discussing causes of failure in service provision and describe problematic consumers. According to the authors, this failure in proper service provision is caused by problematic consumers and their behavior. Examples include drunken consumers negatively affecting the company's staff and other consumers; verbal and physical abuse targeted at staff or other consumers; and consumers consciously breaching the selling policy by trying to return a non-refundable purchased item. To Hoffman and Bateson, *consumer misbehavior* is caused by consumers who are impolite, uncooperative, and make many invalid claims.

Following Woo and Fock (2004), the axiom that the consumer is always right is no longer applicable, and companies often realize that the consumer is, in fact, not right at all. Although consumer satisfaction is essential to building long-term rapport, some consumers are incapable of being satisfied with service quality. Moreover, not every satisfied consumer can be retained. For most businesses, it is impossible to please every single consumer since the cost of such advanced service becomes unprofitable. Too much attention focused on the so-called "bad consumers" may pose a threat to the company's performance and its existence. Companies should retain "good consumers" as long as possible and get rid of the "bad ones."

Consumer misbehavior is also referred to as *abnormal consumer behavior* by Fullerton and Punj (1993). The authors define this type of behavior as one that breaks all generally accepted norms of market conduct and is deemed unacceptable by sellers and most consumers. Abnormal consumer behavior leads to serious material, physical, or psychic damage to staff and other consumers.

Moschis and Cox (1989) refer to consumer pathological behavior as deviant, opposing common norms and standards in the form of customs, rules, regulations, laws, etc. When consumer behavior is not compliant with these norms, society perceives it as unacceptable, undesirable, and dysfunctional. The defined criteria may differ in terms of its significance to society, which, for example, expects its members to be rational consumers, yet, this rationality is not precisely and unequivocally defined. Society seems to be more demanding with respect to behavior that disturbs the functioning of the system—an attitude reflected, for example, in the making of legislative regulations. Market exchange has fundamental importance for sound and healthy functioning of the market itself, and society expresses its expectations through rules and regulations that monitor the exchange processes. Since the market is not uniform in terms of individual needs, values, or behavior, the consumer does not always observe the consumption norms (e.g., smoking in a no smoking area). In addition, consumer behavior that is not compliant with standards perceived as norms by most consumers, whether or not it is dysfunctional for the society, is not always a deviant behavior. Thus, the consumer does not have to respect general food consumption norms (e.g., being a vegan), or consumers can be engaged in behavior which is deemed as dysfunctional (e.g., impulse shopping, a materialistic lifestyle, excessive brand

loyalty) as these types of behavior do not contribute to the effective allocation of resources. Nonetheless, such types of behavior may not be deviant because they may allow for consumer satisfaction or even well-being.

According to Mitchell et al. (2009), unethical consumer behavior should be defined as direct and indirect activities that lead to consumer or company financial loss and reputation damage. Muncy and Vitell (1992) identify three basic factors affecting the decision-making process:

1. The role played by the consumers (e.g., whether their behavior is active or passive)
2. The perceived illegal character of the behavior (e.g., dishonest and treacherous activities)
3. The perceived significance of consequences (e.g., whether a given activity can be easily spotted by others)

Reynolds and Harris (2009) define pathologies in consumer behavior as dysfunctional and refer to situations in which the consumer consciously violates generally accepted conduct norms in consumption. By using the term *dysfunctional behavior*, the authors emphasize intentions and violation of norms.

With reference to the above-presented considerations, the study into consumer misbehavior should be based on the assumption that misbehavior is a consumer action which does not comply with generally accepted norms of market conduct and which is taken to benefit only the consumer. Simultaneously, misbehavior exerts a negative influence on both companies and other consumers, as well as on the misbehaving consumer.

RESEARCH METHOD

In order to empirically identify the relationship between social values of consumers and their attitudes toward misbehavior, a survey was conducted using a structured questionnaire. Direct research was conducted using the online survey method in 2016. The total number of respondents was 1,395. As a result of the verification of the correctness and reliability of the collected material, 1,200 questionnaires were analyzed.

The purpose of this nationwide research was mainly to determine the social values represented by consumers. By undertaking research on the impact of values on consumer attitudes toward misbehavior in the market, Schwartz's (1994) theories were adopted as the theoretical framework. These concepts were chosen because the model includes values that reflect a full motivational continuum, ranging from altruism, openness to change and conservatism, to selfishness. Previous consumer behavior studies most commonly used Kahle's (1983) value. Although the Kahle model was specially developed for research into consumer choices, it does not include all categories of values, which may be extremely important in the study of pathological behavior of consumers. The Kahle model primarily includes values expressing concern for one's own good, while studying misbehavior—the opposite of sustainable consumption—the values expressing concern for others, including future generations, and the common good are also important.

Our research has focused on the impact of values on consumer attitudes toward misbehavior in emotional terms. Respondents could respond to three options describing their emotional attitude toward misbehavior:

1. An accepting attitude: *Consumers' misbehavior is acceptable to me.*
2. A negative attitude: *I believe that there can be no tolerance for any misbehavior of consumers.*
3. A relativistic neutral attitude: *I can accept misbehavior of consumers in justified cases.*

Attitudes were chosen as an independent variable because the relationships between values and attitudes are the strongest. Attitudes, like values, belong to the consumer's cognitive system and are directly their successor in the chain of interactions from values to behavior (Homer and Kahle 2010).

RESULTS AND DISCUSSION

Based on the conducted research, the characteristics of the examined population were first analyzed in terms of preferred values. Benevolence is the preferred value among consumers. Consumers attach similar importance to security and universalism. On the other hand, hedonism and power are the least important to consumers.

The analysis showed that among the respondents, values related to caring for others were much more preferred because both kindness and universalism focus on the well-being of others, caring for the natural environment, and tolerance. In turn, security in a broader sense concerns not only ensuring stability to the individual consumers, but also their relatives and surroundings. The study unequivocally shows that values expressing consumer self-interest are much less preferred. Detailed descriptive statistics on consumer values are presented in Table 1.

TABLE 1. Descriptive Statistics for Values Professed by Consumers

Values	Descriptive Statistics					
	N, Valid	Average	Median	Minimum	Maximum	Standard Deviation
Hedonism	1200	3.87	4.00	1.00	7.00	1.51
Achievement	1200	4.36	4.50	1.00	7.00	1.44
Power	1200	3.90	4.00	1.00	7.00	1.47
Universalism	1200	5.05	5.33	1.00	7.00	1.11
Benevolence	1200	5.25	5.50	1.00	7.00	1.25
Safety	1200	5.15	5.50	1.00	7.00	1.29
Conformism	1200	4.72	5.00	1.00	7.00	1.31
Tradition	1200	4.44	4.50	1.00	7.00	1.35
Stimulation	1200	4.40	4.50	1.00	7.00	1.32
Independence	1200	4.88	5.00	1.00	7.00	1.28

The research shows that in the studied sample there were slight differences in the preferences of the values between women and men. Women attach more importance and meaning to such values as universalism, kindness, and security. In contrast, men attach importance to values based on competition, the pursuit of achieving and increasing resources, and the search for diversity. In a statistical sense, the significance of differences in the assessment of value preferences based on sex was observed for hedonism, power, universalism, benevolence, and security. Table 2 presents detailed statistics on the average preferences by sex.

TABLE 2. Test of the Difference of Mean According to Sex—Value Preferences in the Sample

Values	Average, Women	Average, Men	t	Degrees of Freedom (df)	p-Value	N, Women	N, Men
Hedonism*	3.71	4.05	−4.0	1198	0.000	629	571
Achievement	4.35	4.38	−0.3	1198	0.727	629	571
Power*	3.68	4.13	−5.4	1198	0.000	629	571
Universalism*	5.13	4.96	2.6	1198	0.008	629	571
Benevolence*	5.39	5.09	4.2	1198	0.000	629	571
Safety*	5.26	5.02	3.2	1198	0.001	629	571
Conformism	4.79	4.64	1.9	1198	0.054	629	571
Tradition	4.49	4.38	1.4	1198	0.166	629	571
Stimulation	4.38	4.43	−0.7	1198	0.509	629	571
Independence	4.86	4.91	−0.7	1198	0.506	629	571

* Statistical significance at the level $p < 0.05$

The research also shows the preferred values vary depending on the age of the respondents, suggesting that the value system changes with the age of respondents. The growing importance of collectivist values and the decreasing weight of values expressing self-concentration can be observed. Thus, it can be seen that with age the significance of conformism ($r = 0.21$), tradition ($r = 0.20$), and security ($r = 0.08$) increases the most. However, values such as stimulation ($r = -0.20$), achievement ($r = -0.17$), and independence ($r = -0.16$) decrease.

Comparing the impact of sex on consumers' preferred values with the results of Schwartz and Rubel (2005), yielded very similar results. Comparing results of age's impact with Schwartz's research showed age also affects value preferences. At the same time, it is worth mentioning that in comparing the strength of the age impact on individual value categories in the studied population, the significance of individual values increases much more slowly than in the research by Schwartz and Rubel.

Using the Schwartz model in the second stage of analysis, the relationship between values and consumer attitudes toward misbehavior and, as a consequence, sustainable consumption was analyzed. When identifying the role of social values in shaping these attitudes, one should first pay attention to universalism. The motivational basis of its values is the individuals' need to have their community survive. This value in particular expresses concern for the well-being

of other people, care for the environment, and tolerance; these values are important in sustainable consumption (Schwartz 1992). This means that a person who has a high level of universalism strives to care for the well-being of others, including future generations. The natural environment is treated here as a kind of common good; caring for it shows care for the good of society. Thus, misbehavior aimed at harming the entrepreneur, other consumers, or the consumer himself—and in practice against the idea of sustainable consumption as such—becomes the opposite of universalism. Therefore, it should be expected that in this case universalism will shape negative attitudes toward consumer misbehavior in the market. Hypothesis 1: *Universalism will negatively correlate with the attitude toward consumer misbehavior.*

Benevolence is another value that can play an important role in shaping attitudes toward sustainable consumption. This value, like universalism, expresses concern for the good of others. However, such care is limited to the closest relatives of the individual (Schwartz 1992). Although kindness concerns family and friends, it can be expected that this value will also affect negative attitudes toward misbehavior of consumers. Benevolence is about providing support and help to others, and also being opposed to focusing on selfish thinking about one's own well-being. Therefore, the following research hypothesis was formulated. Hypothesis 2: *Benevolence will negatively correlate with the attitude toward consumer misbehavior, while the strength of such impact will be weaker than in the case of universalism.*

Consumer attitudes can be shaped by several values simultaneously, so it is worth paying attention to the importance of other values. One of them is conformity. Conformity reflects the individual's abstention from actions or reactions that could sadden or hurt others or be interpreted as contrary to social norms and expectations (Schwartz 1992). Conformity also expresses concern for compliance with the principles of social coexistence, and thus will promote the concept of sustainable consumption. Misbehavior is behavior that harms others. Therefore, it should be expected that any misbehavior can be read as a violation of the rules of social coexistence. This rule breaking can threaten an individual's good image. It can be expected that the negation of consumer misbehavior gives the opportunity to demonstrate compliance with the principles of social intercourse. In light of the above considerations, the following hypothesis was formulated. Hypothesis 3: *Conformism will negatively correlate with the attitude toward consumer misbehavior.*

Similar to conformism, according to Schwartz's values, is tradition. It expresses respect and a sense of responsibility and acceptance of customs of a given culture and religion (Schwartz 1991). People who revere this value, as in the case of conformism, will adopt negative attitudes toward misbehavior and will positively refer to the concept of sustainable consumption not so much for the sake of other consumers or businesses, but to fulfill their obligations toward religion or higher ideas. Therefore, it can be expected that this value will be related to attitudes toward misbehavior of consumers. The expected relationships are presented in the following research hypothesis. Hypothesis 4: *Tradition will negatively correlate with the attitude toward consumer misbehavior.*

Safety is associated with tradition and conformity. This value reflects the pursuit of harmony and stability in the functioning of the individual in both the

personal and social sphere, and thus the pursuit of sustainable consumption. Security understood in this way concerns stability that a person can provide for oneself and one's loved ones as well as the stability guaranteed by the state (Schwartz 1992). By its very nature, consumer misbehavior generates a threat to the consumer, other consumers, or enterprises. Therefore, the following research hypothesis was formulated: Hypothesis 5: *Safety will negatively correlate with attitudes toward consumer misbehavior.*

Power is another category of values in the Schwartz model, and it reflects the individual's desire to gain control over people and resources. This value also includes the pursuit of high social status and prestige (Schwartz 1992). In other words, people with a high level of strength function to gain an advantage over other people. On the one hand, this style of behavior can be seen as consistent with the essence of misbehavior of consumers, because these individuals pursue their own goals by all means possible, even at the expense of others. However, it can also be assumed that a strong individual will have much more courage than other members of society to react to and oppose the misbehavior of other consumers and influence the acceptance of the concept of sustainable consumption. Therefore, the following research hypothesis was formulated. Hypothesis 6: *Power will be neutral in relation to attitudes toward consumer misbehavior.*

Achievement is related to power. This value reflects the individual's pursuit of personal success. As in the case of power, the measure of such success is not gaining advantage and control over others. People who value achievement strive to obtain competence in accordance with prevailing social norms. Competences should, however, be easily seen in this case (Schwartz 1992). Theoretically, both negative and positive relationships of achievement with consumer misbehavior and the concept of sustainable consumption are possible. It can be assumed that engaging in specific misbehaviors allows the acquisition of specific competences. However, mere contact with this type of consumer behavior does not improve the individual's qualifications. Therefore, it should be expected that achievement will be neutral in relation to misbehavior of consumers, as indicated in the following hypothesis. Hypothesis 7: *Achievement will be neutral in relation to attitudes toward consumer misbehavior.*

Hedonism, like achievement and power, reflects the selfish aspirations of the individual, which is contrary to the concept of sustainable development. This value refers to enjoying pleasure in satisfying the needs of the individual as a living organism (Schwartz 1992). Unlike power and achievement, the pursuit of pleasure in life does not have to involve competition and the accumulation of resources. Attitudes toward the misbehavior of other consumers may therefore be negative, as hedonistic individuals may believe that such behavior harms them. But, at the same time, hedonists can perceive these behaviors as an easy way to meet their needs. Therefore, it can be expected that hedonism will be neutral in relation to attitudes toward misbehavior of consumers on the market. This is reflected in the following hypothesis. Hypothesis 8: *Hedonism will be neutral in relation to consumer misbehavior.*

Hedonism fulfills a kind of mediating link between the values representing the desire to strengthen oneself and the values reflecting openness to changes and neighbors stimulation. Stimulation is a value whose components are excitement, newness, and challenges in life. The foundation of this value

is the pursuit of diversity in life (Schwartz 1992). Misbehavior of consumers can be a significant emotional challenge for the individual, both positive and negative. It can also be an opportunity to experience excitement. Therefore, it can be expected that stimulation will more often arouse positive emotions toward misbehaviors of consumers, and negative ones toward the concept of sustainable consumption; therefore the following research hypothesis was adopted. Hypothesis 9: *Stimulation will be positively correlated with attitudes toward consumer misbehavior.*

Independence is the last category of values in the Schwartz model; it relates to thoughts and actions. Individuals who prize this value attach great importance to freedom, want to solve problems by themselves, and look for new solutions (Schwartz 1992). Individuals who are independent also assign these values to other people. Therefore, misbehavior of consumers or the idea of sustainable consumption should not arouse any reactions from consumers who value independence. In some cases, they can even arouse positive reactions when the individual perceives such behavior in terms of innovative and creative solutions. Therefore, the following research hypothesis was formulated. Hypothesis 10: *Independence will be neutral toward consumer misbehavior.*

In order to verify the hypotheses, analyzes of correlations between the identified values professed by consumers and their declared attitudes were carried out. At the same time, because the variable representing the attitude toward misbehavior was measured on the ordinal scale, Spearman's rank correlation coefficient was used. Verification of specific research hypotheses confirms only part of them (Table 3).

Universalism is negatively correlated with attitudes toward misbehavior. This is demonstrated by a negative correlation with the statement that "misbehavior of consumers is acceptable to me" and positive with "there can be no tolerance for any misbehavior of consumers." People who value universalism do

TABLE 3. Universalism and Attitudes toward Misbehavior (Spearman Correlation)

Values	The Misbehavior of Consumers Is Acceptable to Me	I Believe That There Can Be No Tolerance for Any Misbehavior of Consumers	I Can Accept Misbehavior of Consumers in Justified Cases
Universalism	−0.175*	0.192*	0.002*
Benevolence	−0.163*	0.177*	−0.003*
Conformism	−0.297*	0.222*	−0.012*
Tradition	−0.094	0.157*	−0.049
Safety	−0.141*	0.186*	−0.014*
Power	0.168	0.032	0.124*
Achievement	0.030*	0.036	0.075*
Hedonism	0.216*	−0.159*	0.182*
Stimulation	0.092*	−0.035	0.123*
Independence	−0.018*	0.065*	0.071*

* Statistical significance at the level $p < 0.05$

not accept consumer misbehavior in the market. Therefore, the hypothesis was confirmed, with the strength of the relationship being moderate.

Similar results were obtained in the case of benevolence. In this case also there is a negative correlation with the statement that “misbehavior of consumers is acceptable to me,” and a positive correlation with the statement that “there can be no tolerance for any misbehavior of consumers.” This part of the hypothesis, which states that the force of kindness will be weaker than in the case of universalism, is also confirmed. Therefore, the hypothesis was confirmed in full.

The relationship between conformism and attitudes toward misbehavior is statistically significant and, worthy of emphasis, a strong correlation. The hypothesis that conformism will be negatively correlated with the attitude toward consumer misbehavior has been confirmed. This is evidenced by the negative value of the Spearman correlation index for “misbehavior of consumers is acceptable to me,” and the positive value that “there can be no tolerance for this type of behavior.”

Analyses show that tradition is negatively correlated with attitudes toward consumer misbehavior. The statistically significant relationship refers to only one statement that “there can be no tolerance for any misbehavior of consumers,” and this relationship is not strong. Therefore, the hypothesis was statistically confirmed in part.

On the other hand, the hypothesis regarding the relationship between safety and attitudes toward consumer misbehavior was statistically confirmed. Safety is negatively correlated with attitudes toward misbehavior. A statistically significant relationship was indicated for “misbehavior of consumers is acceptable to me,” as well as for the statement that “there can be no tolerance for any misbehavior of consumers” and “the possibility of accepting misbehavior in justified cases.”

Regarding subjects who value power, it can be stated that results show a relativistic or neutral (no statistical significance) relationship with attitudes toward consumer misbehavior in the market. Lack of significance means no connection. The variable, which is statistically significant, indicates a weak, positive relationship and relates to the acceptance of misbehavior in specific, justified conditions. It can therefore be concluded that the hypothesis has been partially confirmed.

In the case of the achievement value, the analyses show a statistically significant, positive relationship between the achievement and the attitude toward misbehavior of consumers. However, these relationships are weak. Therefore, the hypothesis was confirmed in part because not all attitudes indicated a statistically significant relationship.

The relationship between the next social value, hedonism, and attitudes toward consumer misbehavior is positive and statistically significant. However, these compounds have moderate strength. Consumers professing hedonic values are able to accept the misbehavior of consumers, while rejecting an attitude of total intolerance for this type of behavior. The hypothesis has therefore been confirmed.

This study shows a similar relationship with stimulation and attitudes toward consumer misbehavior, which is positive but not always statistically significant, as in the case of hedonism. And these relationships have much weaker

strength than in the case of hedonism. The hypothesis has therefore been partially confirmed.

As for the impact of independence on attitudes toward consumer misbehavior, the results obtained confirm the negative nature of this relationship. Consumers who prefer independence are generally unable to accept misbehavior and tend to believe that there should be no tolerance of them. The hypothesis has been confirmed. It should be added, however, that although these relationships are statistically significant, they have very weak strength.

CONCLUSIONS

With reference to the study results, it can be concluded that the values reflecting consumer desire to transcend themselves—universalism and benevolence—the hypotheses about the negative relationship with attitudes toward misbehavior of consumers have been confirmed. At the same time, the strength of these relationships is relatively weak. Similarly, with values referred to as conservatism—tradition, conformism, and security—the hypotheses have been confirmed (in the case of tradition partly). These values are negatively correlated with attitudes toward consumer misbehavior in the market. With the increase in the level of these values in consumers, intolerance to various misbehavior also increases.

The third group of values reflects consumers' desire to focus on themselves. These values include power, achievement, and hedonism. This study cannot statistically confirm that consumers with a high level of self-concentration will accept or even tolerate various misbehavior in the market. However, there was a statistically significant relationship regarding hedonists accepting misbehavior.

The fourth category of values refers to consumer openness to change and includes stimulation and independence. In this case, relationships with consumer attitudes are two-way. Consumers for whom independence is very important do not tolerate any market misbehavior, while stimulus-oriented people are able to accept misbehavior, but this correlation was statistically confirmed only partially.

The results of this research deliver many advantages considering all applications. First, it can greatly contribute to development of scientific theories, especially consumer behavior and consumption, and specifically to sustainable consumption theories. In addition, the findings offer significant support toward understanding the complex relations between consumers and companies. Thus, it can be concluded that the identified findings fulfill all scientific and practical functions.

In the assessment of theory-cognitive values of consumer misbehavior, it is necessary to highlight that the findings demonstrate different aspects of consumer misbehavior by means of comprehensible components of social values. The findings not only explain consumer attitudes toward specific misbehavior, but also help predict consumer behavior (reactions) under some specific values.

The findings may be widely applied in the practical operation of companies that want to implement and develop business based on the sustainable development phenomenon. In the meantime, possessing knowledge of the consumer, consumer values, and consumer attitudes is indispensable for the development of any marketing program, and for the elaboration of methods to prevent and counteract consumer misbehavior. Unlike governmental policy, these activities

are meant to serve not only consumers, but also the interests and profits of companies.

It should be borne in mind that the research has some limitations, which, however, can be an advantage for future research. The key limitation of the study is that it was conducted only in one country. Consumer misbehavior may differ in more well-developed countries as well as in poor, less-developed countries. Nonetheless, focusing on different markets, analyzing the phenomenon in different countries, and sampling different consumer segments will contribute to a better understanding of consumer misbehavior and their attitudes toward sustainable consumption.

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