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Predictive Applications of Debarment List in Public Procurement

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Abstract

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MPhil., Walden University, 2020

MPA, University of Illinois at Springfield, 2016

MA, University of Illinois at Springfield, 2014

MA, Webster University, 2006

BSc., University of Lagos, 1991

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Predictive applications of a debarment list involve gathering historical data in the list to capture the relationships between the relevant variables in the data to predict the most likely future outcomes. Exploring whether the data in the debarment list could produce predictive analytics, which agencies may use to deter contractors from committing fraud, is unknown. This study closed the literature gap through a quantitative nonexperimental analysis of secondary data, inspired by real-life administrative decisions. The purpose of this study was to analyze the City of Chicago's debarment list to determine the statistical probability of business entities that may be debarred from receiving contract awards from the City. The study's theoretical foundation was predicated on deterrence theory, with a conceptual framework that offered a practical explanation of the dynamics of the debarment deterrence sanction system. The number of debarred contractors sampled from the City's debarment list in the fiscal year 2008 to 2019 was $N = 138$. Results of binomial logistic regression showed that procurement fraud is 50.7% as likely as to cause a firm debarred from receiving contracts from the City compared with an individual. However, procurement fraud is 72.60% as likely as to cause the City to debar an individual from receiving City contracts compared with a firm. The model showed that phony company fraud is 21.3 times more likely than contract fraud to trigger a firm's debarment. The predictions in this study have social implications for strengthening the use of debarment for fraud prevention, public advocacy, and better public funds management and positive social change.

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Dedication

To my godly children: Virtuous Fehintoluwa Komolafe (*Virty Baby*), Saint Valor Komolafe (*Son of man*), and Faith Victorious Komolafe (*VVVV-Victorious!*). You all stood by me throughout my PhD journey, which began in 2017, and most especially despite the disruptions caused by COVID-19 pandemic (Coronavirus) at the beginning of March 2020. However, to the glory of Almighty God, I completed my PhD journey in December 2020. My dad prophesied a PhD degree to me when I was very young; a time I knew nothing about a PhD. I hereby pass the generational blessing to all of you: each of you shall receive a PhD degree in my lifetime, in the name of Jesus Christ. Amen!

Acknowledgments

I am very grateful to the Almighty God. His mercies are new for me every morning. Thank you, Jesus Christ for making this dissertation journey and all other things possible for me in the order of Psalm 16:6. Notably, I received God's favor to complete my PhD degree with a GPA of 4.0 (Perfect GPA!). To God be the glory – hallelujah!

Special thanks to my Committee Chair, Dr. Mary D. Bruce, my Methodologist, Dr. Lori Demeter, and URR, Dr. Kristie Lewis. You all offered me unstinting support, extremely sound and helpful feedback that always kept me on track and enabled me to reach this accomplishment expeditiously. All of you helped me get my work right the first time. To Dr. Sue Subocz. Chief Academic Officer and Provost at Walden, thank you for your leadership and support for exceptional education. To Professor A. E. Fila, I am deeply grateful for your counseling and mentorship. To Professor Sope Williams-Elegbe, thank you for your magnanimous support. Dr. Adam Lund, I appreciate your statistical guidance. Sam Herrington, thank you for proof-reading and editing my manuscript.

To my father, Christopher Komolafe, who art in heaven; you decreed and prophesied a PhD for me when I was in High School. Dad, your prophecy has come to pass even as you are now with the Lord, rejoicing as I use the degree to benefit humanity and glorify God. I am glad my mother who built the foundation for education for me, is still alive to bless my PhD. Thank you, mommy Goodness, for all your midnight prayers.

Finally, hat tip to UIC library and all 89 I-Share libraries in Illinois. I can't not imagine the amount of money I would have spent buying all the books I read for this study, which I otherwise freely borrowed from these libraries!

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

A debarment list is an essential and highly sought-after exclusion record. Federal Acquisition Regulation (FAR, 2014) requires federal government agencies to compile the debarment list of debarred individuals or firms on the web-based System for Award Management (SAM) exclusion records maintained by General Services Administration (GSA). Also, government agencies are required to check the debarment list to avoid unintentionally soliciting offers from, or awarding contracts to, contractors on the list (FAR, 9.404 (c)(5)). In debarment practices, the debarment list has gained contractors' attention: it serves as a deterrent resource, which government contractors can perceive as a source of sanction threat that can affect their present integrity and loss of business opportunities with public agencies at all levels of government. A contractor listed in the debarment list is automatically disqualified from receiving contract awards from the government for a specified period (Levy & Wagner, 2018).

In this study, I explored the extent to which the variables of contractor location, debarment fraud and length of debarment are associated with the probability of getting a business entity excluded from receiving contract awards from the City of Chicago. No previous studies examined whether the data in a debarment list have predictive capabilities. The study showed that the ability to deter public procurement fraud might be subject to the predictive capability of relevant fraud data in a debarment list. This study provides scholarly knowledge on the statistical information that may enable procurement leaders and policymakers to utilize the debarment list to improve debarment practices.

The organization of this study is as follows: Chapter 1 introduces the study's background with further emphasis on the research problem, research question, purpose of study, and the other contexts that guide the study. Chapter 2, the literature review, explicates current studies on debarment practices related explicitly to the debarment list. It also provides scholarly information on deterrence theory, which formed the theoretical foundation of the study. Chapter 3 provides the overall methodological approach for the study, including the use of the research design, collection of data, and data analysis plan to advance the purpose statement and research question of the study. Chapter 4 presents clarity of statistical analysis and predictive modeling results obtained from binomial logistic regression analyses. The chapter also provides step-by-step modeling techniques that are particularly relevant to the study; the hypotheses were tested, and the research question answered. In Chapter 5, I interpret the results of the findings, focusing on the variables of interest in the study. In this concluding chapter, I discuss the limitations and implications of the study and offer policy recommendations, some of which invite a paradigm shift to adopt artificial intelligence techniques to enhance predictive applications of debarment list in public procurement.

Background of the Study

An ancient moral law established that: "You shall not steal, nor deal falsely, nor lie to one another" (Leviticus 19:11, NKJV). The acts of fraudulent misconduct, which includes but is not limited to stealing, cheating, robbery, false claims, and wage fraud, have been part of human existence in many human endeavors (Exodus 20:15-17; Leviticus 19:13). As it was in the old times, so it is in public procurement in these

modern times. Extant studies have confirmed that public procurement fraud and corrupt practices perpetrated by unscrupulous contractors are still prevalent (Achua, 2011; Association of Certified Fraud Examiners, 2018; Miranzo, 2017; Rose-Ackerman & Palifka, 2016; Rustiarini, Nurkholis, & Andayani, 2019; Schuchter & Levi, 2016; The Project on Government Oversight, 2019; Transparency International, 2014; Trepte, 2005). Procurement fraud has led to wasteful use of taxpayers' money (Brink, 2013; Guile, 2010; Mogner & Chene, 2014; Tracy & White, 2011).

Public procurement fraud is a widespread phenomenon; it is evident at the global, national, and local government levels. For example, at the global level, Spruill (2014) reported that an estimated average of $9.5 trillion is spent globally on public contracts, out of which Transparency International (2014) estimated at least $2 trillion would "disappear from annual procurement budgets" (p. 8). At the national level, total procurement fraud settlements and judgments in the United States between 2009 and 2015 were estimated at $4 billion (Barger & Walthall, 2016). Federal spending on purchasing of goods and services during the 2019 fiscal year accounted for about $4.4 trillion (USAspending.gov, 2019). Procurement in the government sector is enormous and complex, and government agencies spend taxpayers' money to buy goods and services to fulfill its obligations and optimize public welfare (Cibinc & Nash, 1986; U.S. Government Accountability Office [GAO], 2011). At the local government level, Quarterly Reports from 2015 through 2019 published by the Office of Inspector General (OIG) at the City of Chicago showed that procurement fraud perpetrated by the City's contractors had become part of the drivers for economic loss for the City in terms of costs

of fraud. For easy reference in this study, the word “City” may be used to denote the City of Chicago.

The nature of corruption in government procurement is complex (Williams-Elegbe, 2012) and difficult to detect (Wang, 2016) because fraudulent contractors can defraud the government at any stage of the procurement activities (Caulfield, 2014; Green, 2013). Taxpayers’ money ought to be protected and directed to fund procurement of goods and services for the common good of the people (Peltier-Rivest, 2018; Pieth, 2005; Schultz, 2004; Tracy & White, 2011). To protect the interests of U.S. government, FAR (2014) requires government agencies to request bids from or award contracts to contractors that are only presently responsible [(16 48 C.F.R. § 9.402(a)]. The U.S. government is currently using debarment and suspension as one of the fraud-preventive programs to protect itself from procurement fraud, waste, and abuse (GSA, 2019). A debarment and suspension initiative to protect the government interests is through the debarment list. FAR (2014) has prescribed that agencies should compile the debarment list of debarred contractors. As such, a contractor listed in the debarment list cannot receive contracts from the government agencies for a fixed period. The debarment list is a government repository that contains information about contractors determined to be ineligible to receive contracts from the government (American Bar Association [ABA], 2018).

It is practically impossible for government agencies to plan and spend vast sums of public funds to buy goods and services devoid of contractors’ procurement misconduct such as corruption, waste, fraud, collusion, coercive, and abuse practices. Otherwise,

there would be no need for debarment sanctions, and by extension, there would be no need for keeping a debarment list. The government uses debarment and suspension as statutory and discretionary tools to prevent public procurement fraud, waste, and abuse (GSA, 2019). A suspension is a temporary remedy to disqualify a nonresponsible contractor from receiving government contracts. At the same time, a debarment excludes nonresponsible contractors from receiving government contracts for a fixed period after debarment procedures (FAR, 2014). For simplicity in this study, suspension and debarment generally will be denoted as "debarment." Debarment sanction is a public procurement regulation the U. S. government uses as the last resort to protect its interests (Interagency Suspension and Debarment Committee [ISDC], 2019).

Some government agencies' response to prevent fraudulent and corrupt procurement practices is exclusion action to debar contractors from partaking in government procurement for a fixed time (Gordon, 2013; Tillipman, 2013). For example, the U.S. government has implemented 10,982 debarments between Fiscal Year 2009 and 2017 (ISDC, 2019). A debarment is implemented in all three government levels in the United States (Williams-Elegbe, 2012). At the municipal government level, the City of Chicago's debarment procedures mirror the federal government's procedures. The City applies a debarment sanction program to stop unscrupulous contractors, but the debarment regime is still unable to stop procurement fraud (Komolafe, 2018). For example, the City of Chicago recorded about 158 debarment actions between fiscal years 2008 and 2019 due to several frauds committed by the City's contractors (City of Chicago, 2020). It suffices to say that debarment at the federal or local government level

can only end a contractor's business with the government but may not necessarily end public procurement frauds. The debarment sanction system has received a great deal of attention from public procurement scholars (Auriol & Søreide, 2017; Williams-Elegbe, 2015), lawyers (Levy & Wagner, 2018; Yukins, 2013), policymakers (Cibinc & Nash, 1986), government organizations (GAO, 2011; GSA, 2019) and international organizations (Transparency International 2014; The World Bank Group, 2016). Current research recognizes that debarment practices can effectively deter contractors from committing fraud (Cerrone, Hermstrüwer, & Robalo, 2018; Whisler & Churchill, 2017). Nevertheless, no research has specifically focused on the predictive applications of the debarment list; this is a gap in the literature on debarment practices. The debarment list is an essential list that government agencies must check before awarding contracts to contractors (FAR, 2014; 31 U.S.C. § 6101). What is unknown is whether the data in a debarment list have predictive capabilities; this was the focus of the study.

In this study, I addressed the literature gap by presenting new knowledge about the important link between the predictive relevance of a debarment list and the effectiveness of debarment deterrence on government contractors. To achieve this goal, I analyzed the City of Chicago's debarment data to produce predictive analytics. Public organizations need the capability to analyze exclusion records to make actionable predictions that can improve debarment practices (Wang, 2016). With the understanding of the literature gap on the predictive capability of an agency's debarment list, I chose a quantitative approach to analyze the Debarred City of Chicago Firms and Individuals.

That is, the debarment list of the City of Chicago and show that statistical predictions are possible from a debarment list.

Problem Statement

The relationship between a contractor's location, debarment fraud, the length of debarment, and business entity in a government debarment list is not clearly understood. Several studies have used different concepts or techniques to focus extensively on debarment practices as an emerging frontline tool to sanction public procurement fraud. Auriol and Søreide (2017) used theoretical economic analysis to predict the effect of deterrence on debarment. Cerrone et al. (2018) used game theory to conduct a study on debarment predictions for collusive biddings in public procurement. Wang (2016) used a combination of game theory, statistical methods, and support vector machine (SVM) to analyze historical fraudulent DOD contractors' data in the Federal Procurement Data System to classify new data to detect procurement frauds. Gallego, Rivero, and Martinez (2018) utilized machine-learning techniques to predict contract inefficiency and malfeasance in Colombia's e-procurement system. However, no author has specifically addressed how public agencies can use their debarment lists to make statistical predictions that may improve debarment practices. This literature gap is surprising because the debarment list is a well-sought list, which government agencies must maintain and check before awarding contracts to any contractor (FAR, 2014). What is less well known in this literature gap but crucial to understand, is that the data in a debarment list may have predictive capabilities.

The general problem is that despite maintaining a debarment list, government agencies continue to face the risks of contracting with fraudulent or criminal contractors (Auriol & Søreide, 2017; Guile, 2010; McCue, Prier, & Swanson, 2015; Rendon & Rendon, 2015; Tillipman, 2013). The specific problem is that public agencies are not analyzing their debarment data enough (GAO, 2005, 2011) to gather predictive and actionable statistical information to improve debarment practices (Søreide, Gröning, & Wandall, 2016). The magnitude of these problems is that public agencies merely maintain a debarment list to check for unqualified contractors and alert other agencies of contractors that are ineligible to do business with the government (ISDC, 2017). As a result, the debarment list is underutilized in many public agencies (Amey, 2013; Schooner, 2004) and thus needs greater attention (GAO, 2011).

The critical gap in the current literature requires ample study on the debarment list; understanding how the relationship between a contractor's location, debarment fraud, the length of debarment, and business entity in a government debarment list can offer statistical predictions in public procurement. The problematic dearth of studies on government agencies' capacity to utilize a debarment list to make predictive analyses should not continue. It is essential to minimize or curb procurement frauds in the public sector; otherwise, as Tracy and White (2011) suggested, the funds agencies need to provide services to the people may be depleted by the costs of fraud. It has become imperative to conduct this quantitative study to analyze a government debarment list to determine statistical predictions, which government agencies may utilize to optimize their debarment practices and prevent public procurement fraud.

Purpose of the Study

The purpose of this quantitative study was to examine the predictive relationship of the effects of contractor location, debarment fraud, and length of debarment on business entities listed in the debarment list that were debarred from receiving contract awards from a municipal government in the State of Illinois. The independent variables were contractor's location with two location categories (Chicago and Other cities), debarment fraud with two fraud categories (procurement and nonprocurement), and the length of debarment. The dependent variable was busines entity with two business registration types (firm and individual). The study analyzed the City of Chicago's debarment list to determine the statistical probability of firms or individuals that may be debarred from the array of contractors doing business with the City.

Research Question and Hypotheses

The research question for the study is as follows: What predictive relationship, if any, do the location of contractor, debarment fraud, and the length of debarment on business entities (firms or individuals) listed in the debarment list have as to whether they were debarred from receiving contract awards from the City of Chicago municipal government in the State of Illinois?

Null hypothesis: The debarment fraud of a debarred contractor listed in the debarment list of the City of Chicago will not be a significant predictor of business entity when compared to the contractor's location and the length of debarment.

H_o: μLocation = μFraud = μLength.

Research hypothesis: The debarment fraud of a debarred contractor listed in the debarment list of the City of Chicago will significantly increase the ability to predict business entity when compared to the contractor's location and the length of debarment.

H_a: μLocation ≠ μFraud ≠μLength.

Theoretical Foundation

The theoretical foundation is the blueprint that serves as a guide, support, and structure of research (Grant & Osanloo, 2014). Deterrence theory is the theoretical foundation that guided this study. Modern deterrence theory was rooted in the earlier works of Beccaria's (1986 [1764]) *On Crimes and Punishment* and Bentham's (1988 [1789]) *The Principles of Morals and Legislation*. Deterrence theory emphasizes the probability of a reduction or prevention of illegal or unethical acts through threats of legal sanctions or penalties (Nagin, 2013; Paternoster, 2010; Tomlinson, 2016). According to Tomlinson (2016), deterrence theory hinges on three assumptions: "clear message, perception of sanction, and rational decision" (p. 33). Extant studies showed that deterrence theory operates on three crucial tenets: certainty, celerity, and severity of punishment (Maxwell & Gray, 2007; Nagin & Pogarsky, 2001; Paternoster, 2010). The rationale for the choice of deterrence theory is predicated on the assumption that debarment sanction is a deterrence-oriented program that may prevent fraudulent contractors from receiving government contracts (Roberts, 2010). Deterrence theory offers a practical explanation of the dynamics of the debarment deterrence sanction system.

According to deterrence theory, debarment will exclude *not presently responsible* contractors from receiving contracts from the government (specific deterrence) and prevent *would-be not presently responsible* contractors from doing business with the government (general deterrence). When a contractor is debarred following a violation or crime that is certain, swift, and severe, a contractor is less likely to repeat the crime, and the message is sent to other contractors showing the consequences of the commission of the crime (Purpura, 2019). The study used these logical connections to basic deterrence theory to explain the role of debarment sanction as a deterrence-focused program in public contracting established by the government to protect itself from doing business with unscrupulous contractors. Specifically, in the study, I weaved the tenets of deterrence theory into the research design to explore the effects of the research variables on deterrence debarment action.

Conceptual Framework

The debarment deterrence model (DDM) is the conceptual framework I developed for the study. The model is a synthesis of the deterrence theory and debarment sanction concepts gathered from the literature review. The three elements in the model are: (a) the predictor variables, which are the length, fraud, and location; (b) debarment deterrence, which is the notion that the debarment list may provide enough deterrence to keep fraudulent contractors from engaging in business dealings with the government because this list is a source of a threat that may portend a significant reputational risk on other contractors (Peirone, 2018); and (c) the outcome variables, which are contractors who registered to do business with the City as firm or individual. This model was used in this

study to facilitate the understanding of the same variables in the debarment list, the deterrence theory, and the way the theory and debarment list was operationalized for predictive applications in this research.

Nature of the Study

The nature of this study is a nonexperimental quantitative method of secondary data analysis. The study's focus was to analyze the archival data in the debarment list of the City of Chicago to provide statistical predictions that may help improve debarment practices in public procurement. The secondary data analysis was used to examine the predictor variables (i.e., contractor location, debarment fraud, and length of debarment). It was also used to assess the extent to which these three predictor variables individually and collectively predict the outcome variable (i.e., business entity). The choice of the analysis of archival data is consistent with the argument of Chidlow, Ghauri, Yeniyurt, and Cavusgil (2015), that archival data is suitable to investigate the relationship among variables. Scholars agreed that secondary data analysis is appropriate when the data consist of dependent and independent variables relevant to the research (MacInnes, 2017; Vartanian, 2011). Hence the research design of secondary data analysis best served this study.

Quantitative research measure variables and test relationships between variables to reveal patterns that lend credence to existing theories (Leavy, 2017). The study's research design aligned with deterrence theory as an analytical lens to explain the deterrence effect on the predictor variables in the public organization debarment process. Statistical predictions estimate functional relationships that can provide outputs to a set of

inputs (McNabb, 2018; Wu & Coggeshall, 2013). The predictors variables were required in this study to develop a model that could predict the most statistically probable outcomes. I used binomial logistic regression as the statistical tool to build predictive models as a function of predictors—to test the hypothesis and predict the answer to the study's research question. Scholars have agreed that binomial logistic regression analysis is suitable to test, model, classify and predict events where the dependent variable is categorical, whereas the independent variables can either be categorical or continuous (Bryman & Bell, 2015; Frees, Derrig, & Meyers, 2014; Laerd Statistics, 2017, Osborne, 2015).

Definitions

Administrative agreement: Agreement between an agency and a contractor to resolve a contractor's present responsibility inquiry such that the terms and conditions of the agreement will adequately protect government business interests without the imposition of government debarment (Levy & Wagner, 2018).

Business entity: A business entity is also referred to as a contractor in this study. A business entity is an individual or a firm registered to transact business with a government agency (FAR, 2014).

City: A short term used to denote "The City of Chicago" (City of Chicago, 2020).

Contractor: An individual or firm that has entered into an agreement to provide goods or services to a government agency (FAR, 2014).

Debarred: A contractor that is excluded from doing business with or receiving government contracts is "debarred" (Levy & Wagner, 2018).

Debarment: A sanction imposed by a public entity to exclude nonresponsible contractors (firms and individuals) from participating in public procurements for a specified period (Cerrone et al., 2018; Shaw & Totman, 2015).

Debarment fraud: A type of fraud that caused the debarment of a contractor who egregiously violated procurement rules (City of Chicago, 2020).

Debarment list: The debarment list is a government repository that contains information about contractors that are determined to be ineligible to receive contracts from the government (Levy & Wagner, 2018).

Discretionary debarment: The debarring officer of the debarring agency applies the agency's discretions to determine whether the implementation of debarment measures is appropriate to disqualify contractors who have committed certain offenses (Williams-Elegbe, 2012).

Exclusion: A general term that expresses either suspension, disqualifications, blacklisting, or debarment of a contractor from government contracts (Williams-Elegbe, 2017)

Entity: An entity is a contractor that is either a person or organization who has a legal right to do business with the government (Federal Acquisition Institute, 2013).

Exclusion parties list: A web-based online register of companies excluded from the United States government's procurement and nonprocurement activities (GSA, 2019)

Federal acquisition regulation: A body of regulations governing all contracting and procurement activities of the federal agencies in the United States of America (GAO, 2011).

Not presently responsible: This term means that debarment is not intended as a punishment for past violations but relates directly and focuses only on the contractor's current state (Robins & Baker, 2015).

Rational decision: This means maximizing the satisfaction of the decider's preferences (Kogelmann & Gaus, 2017).

Statutory debarment: This is when government legislation or policy mandates outright disqualification of contractors convicted or found guilty of committing specified offenses; the debarring officer must implement this policy (Williams-Elegbe, 2012).

Suspension: A suspension is a temporary remedy to disqualify a nonresponsible contractor from receiving federal contracts (GAO, 2012; Miller & Martin, 2006).

Assumptions

A central assumption in this study is the view that contractors should make rational decisions. They have perceptions of the consequences of committing fraud if they want to or continue to do business with the government. However, this assumption may not be realistic in all situations because contractors are human beings who are susceptible to erroneous perceptions. The predictive value of the rational choice assumption may be diminished when the contractors did not choose rationally. For example, a study by Chapman et al. (2010) reported that some offenders under the influence of drugs might not make rational choices.

Rational decision is relevant to this study to understand some critical dynamics about debarment deterrence. In this study, I presumed that debarment actions can deter future violations to the extent that exclusion that is certain, swift, and severe would

outweigh the reward a contractor obtained from committing a crime. This assumption is consistent with the argument of Kogelmann and Gaus (2017) that rational choice of human actions is necessary to get "predictive leverage in some contexts" (p. 232). Also, I made the assumption in this study that the effective deterrence of a contractor is possible through a combination of a contractor's actions and a debarment sanction system. In other words, the predictive advantage is that a contractor is assumed to make rational decisions to avoid being listed in the debarment list and thus deterred by debarment sanction.

Scope and Delimitations

Government debarment typically covers sanctions for both procurement and nonprocurement violations (2 CFR § 180.970 (a)). The scope of this study focused primarily on debarment for procurement fraud because the study is essentially germane to procurement in the public sector. Debarment fraud in this study is a dichotomous categorical variable (procurement fraud and nonprocurement fraud). I used my personal experience as a certified public procurement scholar-practitioner to analyze the City's debarment list professionally to determine the debarment fraud that are either procurement related or nonprocurement related. Nonprocurement related fraud was coded as a lower numerical number. This coding method was appropriate to give a premium to procurement fraud, which I designed to predict in the study.

The study was delimited to the research design of secondary data analysis of government contractors listed in the City of Chicago's debarment list. Only secondary data was analyzed in this study. I did not design the study to survey opinions of debarred

contractors but to examine the debarred contractors' data and explore alternative ways to utilize a debarment list in public procurement. Another delimitation of this study is the potential generalizability of how the study could use the City of Chicago, a municipal government, to generalize for other government levels. I used the data in the City of Chicago's debarment list as a sample to generalize that the data in the debarment list of other agencies are similar. Also, this study represented a generalization by replicating the study's results of predictive applications of the debarment list in a municipal government in other government jurisdictions. By making generalizations that explain how debarment concepts are interrelated in other government agencies, the study finds support from Yin (2016), who argued that it is possible to use a holistic and exhaustive analysis of a case study to generalize for other similar settings.

Limitations

One of the study's limitations was that I did not have control on the debarment list as a researcher because the data in the debarment list was the outcome of the City of Chicago's official decisions when the data was originally created. More importantly, the public gets to know about documented evidence of public procurement fraud only when the violating contractor is listed in the debarment list. Another limitation was that the City may not have established its debarment list for research purposes. I did not have to deal with the measures and recency of the City's actions when I retrieved and analyzed this data. However, my research was an attempt to use the City of Chicago's the debarment list to answer the research question of this study and demonstrate that the

ability to deter public procurement fraud may be subject to the predictive capability of a debarment list.

Significance of the Study

Public agencies maintain a debarment list, which debarment officials do not have time to analyze (POGO, 2002), especially for prediction purposes. This study was an attempt to fill the literature gap that has not addressed the predictive capabilities of the debarment list. Doing so, I explored how government agencies can analyze debarment data for predictive analytics that may improve debarment practices. The result of this study's findings might provide broad social implications to enhance legislation and applicability to empower policymakers to formulate policies that can elucidate better use of the debarment list. The study could also improve public procurement effectiveness and efficiency for the public good and tackle social challenges like procurement fraud, waste, and abuse in public organizations. Statistical predictions from this study may provide government agencies a better understanding of how its current contractors may apply best business practices to conduct business with the government responsibly. The study will benefit procurement leadership in public organizations to have a straightforward way to make decisions on how to utilize the debarment list effectively. This study is unique and the first to lead to a direction to future scholarly research because it focused on how agencies can derive statistical predictions from a debarment list. It could offer insights into debarment regimes that may provide efficient and practical deterrent solutions strong enough to minimize public procurement on waste use of taxpayers' dollars. The study's

significance is consistent with GAO's (2011) report, which showed that government oversight was needed to improve debarment practices.

Summary and Transition

This study examined the predictive capabilities of the debarment list of the City of Chicago. Chapter 1 provided an overview of the research problem the study sought to address and its contexts. It also established the need for the research and introduces the frame of reference that guides it, such as the background, purpose, and research question. The chapter included the theoretical and conceptual framework that guided the study and known scope, delimitation, and limitation of the study. I then presented the significance of the study to public policymakers and scholars as well as the study's potential influence on social change in enhancing public procurement effectiveness and efficiency for the public good and tackling social challenges like procurement fraud, waste, and abuse in public organizations.

In Chapter 2, the literature review, I utilize an integrative and historical literature review approach to discuss current studies on debarment practices that are specifically related to the debarment list. I also explicate the application of deterrence theory on the debarment list.

Chapter 2: Literature Review

Introduction

The literature review for this research focused on studies that have been conducted relative to exclusion records and debarment practices in public procurement. This literature review aimed to integrate previous research outcomes related to specific issues on the debarment list pertinent to this research question: What predictive relationship, if any, do location of a contractor, debarment fraud, and the length of debarment on business entities on a debarment list have as to whether they were debarred from receiving contract awards from the City of Chicago municipal government in the State of Illinois? The approach to the literature review was both historical and integrative. The historical review approach examines the history of the evolution of concepts and issues in a research topic (American Educational Research Association, 2018). The review situated government debarment systems in historical contexts to frame an understanding of the problems in the evolution of the debarment list. The integrative review approach considers syntheses and critiques of a research topic (Fink, 2014; Torracro, 2016). I reviewed relevant literature on the debarment system to generate a new perspective on the predictive applications of the debarment list in scholarly research and to give direction for future research.

Current research on debarment practices recognizes that the debarment sanction system can be used as an effective deterrent to contractors that are willing to receive contract awards from the government (Auriol & Søreide, 2017; Cerrone et al., 2018; Moran, Pope, & Doig, 2004; Whisler & Churchill, 2017; Williams-Elegbe, 2019).

However, it is a problem that government agencies are susceptible to procurement frauds despite debarment remedies (Rendon & Rendon, 2016; Auriol & Søreide, 2017). This study focused on the analysis of the debarment list of the City of Chicago. It examined the predictive relationship of the effects of contractor location, debarment fraud, and length of debarment on business entities that were debarred from doing business with the City. Doing business with fraudulent contractors could mean wasteful use of taxpayers' dollars and losses for recipients of government program services (Brink, 2013; Tracy & White, 2011). The Department of Procurement Services at the City of Chicago needs predictive capabilities to support the City's efforts to prevent or deter procurement fraud. After extensive searches in different databases, search results showed that the literature on debarment practices is vast, but there is no specific peer-reviewed literature on the debarment list. However, there are minimal government reports related to issues on the debarment list yet with no information on a debarment list's predictive application.

This chapter includes discussion of (a) literature search strategy, (b) theoretical foundation – deterrence theory, (c) conceptual framework – debarment deterrence model, (d) debarment sanction system – definition, functions and effect of debarment list, evolution and history of debarment list in public contracting, and debarment regulation, (e) the City of Chicago debarment system, and (f) predictor and outcome variables - location of contractor, debarment fraud and length of debarment, and firm and individual as outcome variables. I used deterrence theory to explain debarment sanctions and facilitate the discussion of the conceptual framework underpinning the predictor and outcome variables examined in this study.

Literature Search Strategy

I conducted extensive literature searches on several peer-reviewed articles and journals, which I retrieved online from subject-specific databases. The sources were Business Source Complete, Emerald Insight, ABI/INFORM Collection, LegallTrac, NexisUNI, Criminal Justice Database, SocINDEX, Taylor and Francis Online, LexisNexis, Ovid Journals, and multidisciplinary databases like EBSCO, Thoreau, and Google Scholars. I searched ProQuest Central to retrieve dissertations and theses related to public procurement debarment. I also retrieved relevant information from several textbooks and government publications that focused on procurement frauds and debarment practices in the public sector. Key search terms included the following: *debarment, debarment list, procurement integrity, contracting integrity, procurement blacklist, public procurement fraud, public contracting fraud, suspension, debarred, suspension and debarment, procurement fraud, contractors, contractors, suppliers, pubic funds, City of Chicago, exclusion records, procurement integrity, blacklist, deterrence, deterrence theory, predict, predictive,* and *prediction.* The maximum search period was limited to studies published within the last 5 years. Unfortunately, after running several searches in different databases, including Walden University library staff-assisted searches, the search result revealed very few peer-reviewed literatures on the topic of the debarment list available in the databases. Therefore, researching beyond 5 years was necessary to understand debarment practices and policies in public contracting.

Theoretical Foundation

I applied the deterrence theory to frame this study. Deterrence theory holds that a sanction will ensure compliance of laws and deter future criminal violations of laws (Beccaria, 1986 [1764]; Kennedy, 2009; Piquero, Paternoster, Pogarsky, & Loughran, 2011). The rationale for the choice of deterrence theory was predicated on the assumption that debarment sanction is a deterrence-oriented program that may prevent fraudulent contractors from receiving government contracts (Roberts, 2010). I used deterrence theory to explain the role of debarment sanction as a deterrence-focused program established by the government in public contracting to protect itself from awarding contracts to unscrupulous contractors. As applied to this study, debarment presumed deterrence of future violations such that if the exclusion is certain, swift, and severe enough (Tomlinson, 2016), then the consequences of debarment action will outweigh the reward a contractor obtained from the crime commission (Auriol & Søreide, 2017).

Origin of Deterrence Theory

Contemporary deterrence theory originated from the earlier works of Beccaria's (1986 [1764]) *Essay on Crimes and Punishments* and Bentham's (1988 [1789]) *An Introduction to the Principles of Morals and Legislation* (Tomlinson, 2016). Beccaria agued in his treatise that individuals will make decisions to pursue their desires and avoid pains and may even commit crimes unless deterred. He believed swift and certain punishment would likely prevent and control crimes. For laws to have deterrent value, Beccaria advocated for clearly written laws whose punishments should be commensurate with the crime committed and made known to the public so that people in the society

would understand the consequences of their behavior. Bentham thought that any individual could determine the utility of an action. He advocated that the law's object is to promote societal happiness and lessen pain by "punishing and rewarding" (Bentham, 1988, p.189). His idea led to a criminological assumption that people break the law because lawbreaking benefits outweigh the consequences or costs associated with being caught and convicted (Byrne, 2015; Pratt et al., 2006). The classical perspective of Bentham's proposition suggests that an individual can commit a crime in any given situation. However, an individual can make a rational decision based on the analysis of the cost and benefits of his or her action (Byrne, 2015). At the instance of rational decision, the sanction for a crime is likely to deter a potential offender if that sanction surpasses the benefits of the crime. Such sanction must be certain and swift through the efficient legal or administrative system (Byrne, 2015). Bentham's concept on rational decision-making on the benefits of crimes coupled with Beccaria's principles on crimes and punishment, eventually formed what is now known as deterrence theory (Tomlinson, 2016). Deterrence theory views "humans as rational and hedonistic" (Purpura, 2019, p. 67). That is, deterrence theory suggests that if the punishment for crime is certain, swift, and severe, then an individual is likely not to repeat the crime. At the same time, society would have understood the consequences of committing a crime (Purpura, 2019). Deterrence theory is the foundation underlying criminal punishment in today's criminal justice system (Tomlinson, 2016).

The Scope of Deterrence Theory

The meaning of deterrence theory is wide in scope. A survey of literature on deterrence showed that many scholars have provided divergent empirical and theoretical interpretations to explain the deterrence theory. Paternoster (2010) described deterrence as the prospect of reducing or preventing illegal or unethical acts through threats of legal sanctions or penalties. Geis and Hailes (2016) described deterrence as having the propensity to cause "fear" and "denial" in the commission of a crime (p. 57). Nagin (2013) defined deterrence as "preventative effect of the threat of punishment" (p. 84), that is, "behavioral response to the perception of sanction threat" (Nagin 2013, p. 253). Elliot (2013) described deterrence as a process by which a threatened act is not committed due to deterrent punishment. These definitions point to a convergent meaning: an individual or a population experiences deterrence.

Deterrence theory is contextualized as specific deterrence and general deterrence. On the one hand, the concept of specific deterrence postulates that an individual who commits a crime and is caught and punished will be deterred from future criminal activity due to the individual's experience of punishment (Nagin, 2013; Tomlinson, 2016). On the other hand, the concept of general deterrence proposes that the general population will be deterred from offending due to their response to the threat of punishment. The population will become aware of others being apprehended and punished (Elliot, 2003; Nagin, 2013; Piquero et al., 2011). Some studies on classical deterrence theory, such as Bridges and Stone (1986) and Schneider and Ervin (1990), erroneously suggested that specific and general deterrence concepts have mutually exclusive occurrences. However, other studies

asserted that both specific and general deterrence are not exclusive but merely apply the same mechanism in different populations (Gibbs, 1968; Elliot, 2003; Maxwell & Gray, 2007; Nagin & Pogarsky, 2001). Specific deterrence concerns an offender who has been caught and who would be deterred from committing the same or similar crime due to experience of the punishment for the crime (Elliot, 2003). General deterrence concerns potential offenders who have not yet been caught but would be deterred by the threat of punishment (Elliot, 2003).

Classical deterrence theory is open to reconceptualization (Tomlinson, 2016). For example, Stafford and Warr (1993) introduced punishment avoidance to reconceptualize deterrence theory to mean that an individual can experience both specific and general deterrence occurrences concurrently. Punishment avoidance means that an individual who commits a crime is not caught and escapes criminal justice punishment (Stafford & Warr, 1993). In this regard, a specific deterrence effect will include direct experience with punishment and punishment avoidance, while the general deterrence effect will include indirect experience with punishment and punishment avoidance (Stafford & Warr, 1993). The reconceptualized deterrence theory finds support in Paternoster and Piquero's (1995) research that confirmed concurrent effects of specific and general deterrence in college students' perception of punishments. Otherwise, deterrence theory will fail when a crime is not discovered, reported, or prosecuted successfully (Purpura, 2019).

Assumptions of Deterrence Theory

According to Tomlinson (2016), deterrence theory hinges on three assumptions: "clear message, perception of sanction, and rational decision" (p. 33). A clear message is the relay of a crime's consequence to a target group (Tomlinson, 2016). Perception of sanction refers to when a target group receives the message and perceives it as a threat (Tomlinson, 2016). Deterrence theory also assumes a rational decision on the effects of sanction for a crime over the benefits of the crime (Byrne, 2015).

Tenets of Deterrence Theory

Extant studies showed that deterrence theory operates on three crucial tenets: certainty, celerity, and severity of punishment (Maxwell & Gray, 2007; Nagin & Pogarsky, 2001; Paternoster, 2010).

Certainty. The tenet of certainty refers to the level for which a prospective offender faces a high probability of being caught if the offender commits a crime (Tomlinson, 2016). An offender who perceives a very low probability of being caught will likely commit a crime. Different studies show different results for the certainty of punishment. Maxwell and Gray (2007) and Marlowe et al. (2005) showed that the certainty of punishment effect deterred probationers in a drug rehabilitation program. Matthews and Agnew (2008) argued that the certainty of punishment affects deterrence because an individual with high risk-sensitivity will not be likely to commit a crime. However, Kleck, Sever, Li, and Gertz (2005) showed that the certainty of sanction threats had little effect on recidivism. These mixed results in research literature show that classical deterrence theory applies only to a particular category of crimes (Geerken &

Gove, 1977; Silberman, 1976) and the conditions - individual differences and situational differences, under which sanctions affect compliance (Piquero et al., 2011).

Celerity. The tenet of celerity relates to how quickly an offender receives punishment after being caught for committing a crime (Pratt & Turanovic, 2018). A study by Nagin and Pogarsky (2001) showed that variation in celerity did not predict offending. Any delay between the time the offense was committed, and when the offender is punished will decrease the sanction's deterrent effect (Tomlinson, 2016).

Severity. The tenet of severity refers to the degree of punishment that is corresponding to the type of crime committed by the offender (Nagin, 2013). The deterrent effect of this tenet suggests that very severe punishment for breaking the law can deter an individual from committing a crime. However, studies conducted on incarceration in the United States did not confirm this assumption to be true because incapacitation also has a cofounding effect on crime reduction rate (Kleck et al., 2005; Paternoster, 2010). Kovandzic et al. (2004) showed that deterrence-oriented sanctions such as three-strike legislation have an inverse effect on deterrence and may increase crime.

There is a consensus among scholars that the certainty, celerity, and severity of punishment are the crucial tenets of deterrence theory that will deter an offender and a would-be offender from committing future crimes (Maxwell & Gray, 2007; Nagin & Pogarsky, 2001; Paternoster, 2010). However, studies conducted on these tenets showed mixed results on the effectiveness of deterrence theory (Braithwaite, 2018; Chalfin & McCrary, 2017; Purpura, 2019; Tomlinson, 2016).

The Empirical Deterrence Equation

The classical deterrence theory equation can be explained by a simple model that encapsulates all the basic tenets and deterrence theory assumptions. Several studies support the logic behind the model that certainty of the punishment increases deterrence because the high probability of punishment determines the cost of crime commission (Nagin, 2013). The severity of the probable punishment correlates with the probability of a high cost of the crime (Crump, 2018). The celerity of punishment becomes valuable only if it facilitates the objective of severity and certainty of punishment (Crump, 2018).

The following mathematical expression will represent deterrence:

Proposition 1: *Crime will be successful if and only if*

S x P x C > V……Assessment of success

Proposition 2: *Crime will fail if and only if*

S x P x C < V ……. Assessment of failure

S = Severity of punishment, P = Probability (certainty) of punishment, C = Celerity of punishment and V = the value of committing crime

Proposition 3: *Deterrence of a rational offender is possible if and only if*

Assessment of Failure – Assessment of Success > 0

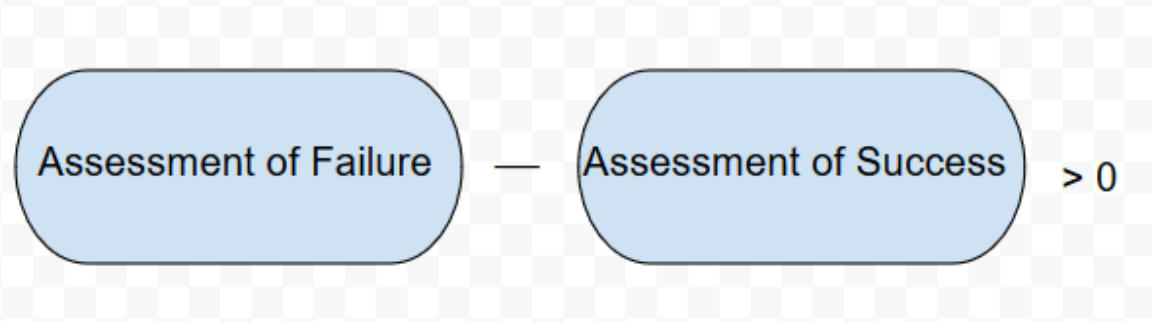

Figure 1. The deterrence equation.

A rational offender will be deterred if and only if the assessment of failure on crime commission is higher than the assessment of the success of crime commission such that the value of the deterrence equation in Figure 1 is greater than zero. This is the equation of classical deterrence theory in its empirical form based on the assumptions discussed earlier in this study. Recall that deterrence theory assumes a contractor is rational; this assumption suggests that a rational contractor will be deterred if the evaluation of failure is higher than the evaluation of success. The most effective deterrence can happen when an individual perceives sanction threats and the probability of apprehension based on the individual's decision-making (Tomlinson, 2016). In other words, if the punishment for the crime is not severe enough to discourage an offender from a crime commission, the offender will not be deterred from committing future crimes (Tomlinson, 2016).

Application of Deterrence Theory

The application of deterrence theory is noticeable in several policy studies. For example, The World Bank established its debarment sanction with a clear deterrence purpose to achieve procurement integrity (Fromageau & Chazournes, 2012; The World Bank, 2014). Fariello and Bo (2015) stated that about 93% of The World Bank's sanctions were through debarment remedy. My review of literature also found that the application of deterrence theory has been tested to be useful in nuclear warfare through mutually assured destruction (Mearsheimer, 1985; O'Neil, 2011), antitrust sanctions in private corporations (Lande & Davis, 2011), speed limits in public road safety (Ritchey & Nicholson-Crotty, 2011), and increased policing enforcement (Nagin, 2013; Watson,

1986). These examples show that deterrence-based policies deter crime when there are sanctions that strengthen the would-be violator's perception of certainty of being caught.

Based on my extensive literature review, I found that a consensus on classical deterrence theory suggests that both the specific and general deterrence are dependent on how a criminal perceives the severity, certainty, and celerity of sanctions (Gibbs, 1968; Maxwell & Gray, 2007; Nagin & Pogarsky, 2001). Although, there is evidence of neglected linkage in deterrence theory. Recent studies on deterrence theory have introduced certain reconceptualization such as punishment avoidance (Stafford & Warr, 1993), deter-ability (Jacobs, 2010), defiance (Chambliss, 1967; Paternoster, 2010), and social context of individual decision-making (Pogarsky et al., 2004). In sum, scientific evidence showed that the deterrence effect on legal sanction is marginal (Tomlinson, 2016), but it is difficult to precisely determine the strength of the deterrence effect of the criminal justice system (Paternoster, 2010). Goals set forth by deterrence theory prescribe that the certainty of an individual being caught is a more effective deterrent than punishment (Nagin, 2013).

Rationale - The Link Between Deterrence Theory and Debarment Sanction

As stated earlier in this chapter, recall that the celerity, certainty, and severity of punishment are the crucial tenets of deterrence theory that may deter a rational offender and a would-be rational offender from committing future crimes. Similarly, in the context of government contracting, the elements of debarment deterrence are the probability of catching a rational contractor for procurement violations (celerity), probability of debarment (certainty), and the probability of listing in debarment list (severity).

Studies showed that contractors might be deterred from committing procurement frauds if there is a high possibility of being caught (Auriol & Søreide, 2017), provided that the costs of fraudulent activity outweigh the benefit of the activity from the perspectives of the would-be offenders (Auriol, Hjelmeng, & Søreide, 2017), and are aware of the law of crimes and sentences by understanding the reaction of criminal justice system to a commission of crimes (Crump, 2018). Debarment is not a punishment (Tillipman, 2012); it is not to coerce or embarrass contractors, but it is a program that leads to swift and certain sanctions to offer deterrence to contractors (Levy & Wagner, 2018).

To deter would-be fraudulent contractors, the government needs an intervention strategy that establishes direct links between fraudulent behavior and consequences by imposing sanctions that include exclusion of ineligible contractors from receiving government contracts. Debarment sanction is a deterrence-oriented program established by the government to deter contractors from committing fraudulent acts against the government (Roberts, 2010). An effective government deterrence-oriented program should have the capacity to prevent, detect, and prosecute contracting misconduct (Auriol & Søreide, 2017). More scholars agreed that debarment action is a severe deterrence-focused government action capable of protecting the government's interest from awarding contracts to an unscrupulous contractor (Crump, 2018; Williams-Elegbe, 2019).

Deterrence theory could explain how debarment deterrence can perform two roles for the government: Debarment as a deterrence program can deter contractors through *fear* of doing business with the government and *denial* of government contracts.

Debarment sanction may instill fear into contractors' minds by using a debarment list to communicate the threat of being caught to the contractors and forces contractor willing to do business with the government to consider their credibility as business partners of the government. On the other hand, the deterrent effect of debarment provides government opportunities to deny contractors government contracts by preventing fraudulent contractors, protecting government interest, stopping fraud, and hindering contractors' capability to commit fraud.

Conceptual Framework

The DDM (see Figure 2), which I deduced from the literature review, represents a synthesis of the deterrence theory and debarment sanction concept.

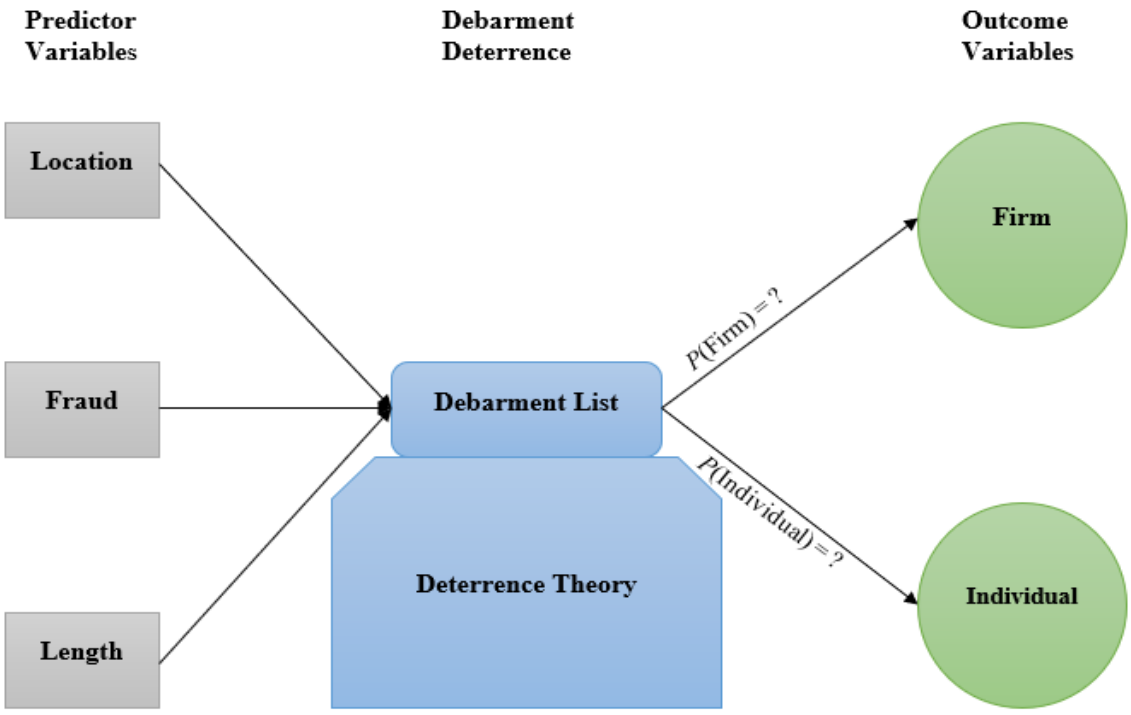

Figure 2. The debarment deterrence model.

The model provided the overall framework for this research. I formulated the model by adapting Fawcett's (1999) technique of "conceptual-theoretical-empirical [C-T-E] formalization" (p. 31). I used the model as a "generative source of thinking" (Ravitch & Carl, 2016, p.34), to indicate the importance of what to be studied based on the research question and the significance of what the research aims to find (Yin, 2016).

In the model, a debarment list is viewed as a deterrent instrument with predictive capabilities through debarment deterrence. By applying deterrence theory, debarment sanction will exclude ineligible contractors from receiving contracts from the government (specific deterrence). Deterrence can prevent would-be ineligible contractors from doing business with the government (general deterrence). Figure 2 illustrates the Debarment Deterrence Model, which I used in this study to answer the research question. This model consists of three domains - predictor variables, debarment deterrence, and predicted outcomes.

Predictor Variables

The predictor variables are the length, fraud, and location appearing in the Model. The direction of an arrow from each predictor variable indicates that the variable is in the debarment list. The precise relationship between the dimensions of the predictor variables is predictable (Fawcett, 1999).

Debarment Deterrence

Debarment deterrence is a phenomenon that assumes that a debarment list is a general deterrent resource or asset, which government contractors can perceive as a source of sanction threat, which can impact the present responsibility of the contractors.

This is because a debarred contractor's information would be published in a debarment list for public viewing (DeVecchio & Engel, 1992). This assumption is consistent with the findings of Peirone (2018), who argued that the debarment list could drive other contractor's behaviors and portends a "significant reputational risks on contractors" (p. 24). As a result, under the classical deterrence theory, the assumption is that a debarment list should have a general deterrent effect on rational contractors willing to participate in government procurements. In other words, the debarment list relays a clear message of the consequence of fraudulent activities to contractors that are willing to make rational decisions to abstain or otherwise, from the commission of procurement frauds. In debarment deterrence concept, a debarment list may become more effective if it rests on the plateau of deterrence theory (see Figure 2). Therefore, a debarment list meets the assumptions for which classical deterrence theory will be useful.

Outcome Variables

The outcome variables in the model are Firm and Individual contractors, representing the outcome of debarment sanction. To explain the deterrent effect of debarment sanction and predictive application of debarment list based on classical deterrence theory, the arrows flying from the debarment list in Figure 2 indicate the magnitude of the unknown odds or probabilities of contractors, P(Firm) and P(Individual). Therefore, the proper alignment between predictor variables, debarment deterrence, and outcome variables is what led to the predictive capability of the debarment list. This study applied statistical techniques that calculated the contractors' odds and probabilities that may be debarred from the City, as presented in Chapter 4.

Debarment Sanction System

The debarment sanction system has received the attention of scholars such as Sope Williams-Elegbe and Tina Søreide. Both authors have conducted several scholarly works in the field of debarment practice. Also, government agencies like GAO and GSA have released several reports on the debarment system. Williams-Elegbe analyzed the debarment in World Bank-financed contracts (Williams, 2007), and provided a comparative evaluation of contractor debarments for corruption across some select countries (Williams-Elegbe, 2012). Also, the scholar reviewed public procurement reforms in Africa (2015), evaluated debarment in Africa (2016), and examined the implications of negotiated settlements in public procurement debarment (Williams-Elegbe, 2019). Søreide provided compelling discourse on economic analysis of debarment (Auriol & Søreide, 2017), and debarment deterrence in corruption and anti-corruption sanctions regime (Søreide, 2015). GAO reported extensively on debarment procedures (GAO, 1987), provided government agencies recommendations for data reporting improvements (GAO, 2005), attention and oversight (GAO, 2011) and suggested action needed to promote transparency (GAO, 2012).

As an antecedent to debarment, extant studies showed that fraud exists in public procurement (Achua, 2011; Aremu, 2015; Beth, 2005; Clark, Coviello, Gauthier, & Shneyerov, 2018; Jenny, 2005; Rose-Ackerman & Palifka, 2016; Schuchter & Levi, 2016; Williams-Elegbe, 2016). Part of the reasons adduced to public procurement fraud is that public procurement is highly vulnerable to corrupt practices (Cerrone et al., 2018; Piper, 2017). This vulnerability is because procurement is primarily concerned with

planning and spending of vast sums of public money to buy goods and services (Independent Broad-based Anti-Corruption Commission, 2016; Piper, 2012). The vulnerability of public procurement to fraud is traceable to the major stakeholders in public procurement. On the one hand, studies showed that public procurement fraud involves contractors that perpetuate collusion, price-fixing, or uncompetitive practices to deny the government of value for money in the procurements of goods and services (Hudon & Garzón, 2016; Tanaka & Hayashi, 2016; Williams-Elegbe, 2019). On the other hand, other studies showed that public procurement fraud involves public officials who desire to gain inducements over monetary transactions by exercising improper discretions to favor preferred contractors (Graycar, 2019; Manning, 2005; Morgner & Chene, 2014). These studies altogether confirmed that the exchange of money between public procurement officials and private contractors is a valuable instrument that also makes public procurement susceptible to corruption (Graycar, 2019; IBAC; 2016). In this context, incentives appear to trigger collusion between government officials and private contractors push for benefits advantage and share gains - a phenomenon Rose-Ackerman and Palifka (2016) described as “grand procurement corruption” (p. 99).

Evidently, from the preceding, government contractors’ fraudulent activities have necessitated the need to exclude contractors that are found to be nonresponsible from doing business with the government. A contractor that has been investigated and convicted of violating procurement laws or committing other offenses indicating an absence of business integrity or honesty is deemed to be a not presently responsible contractor (FAR, 2014). According to Section 9.407-2(c) of FAR, not presently

responsible is a hallmark of debarment; it positions debarment as an inquiry focused only on the current state of the contractor.

Figure 3 illustrates the flow of major activities in a debarment sanction system. When a contractor is determined to be not presently responsible, an agency may impose debarment sanction on the contractor if the agency determines that such action is needed to protect the government's interests, and eventually listing the debarred contractor in the debarment list (GSA, 2019).

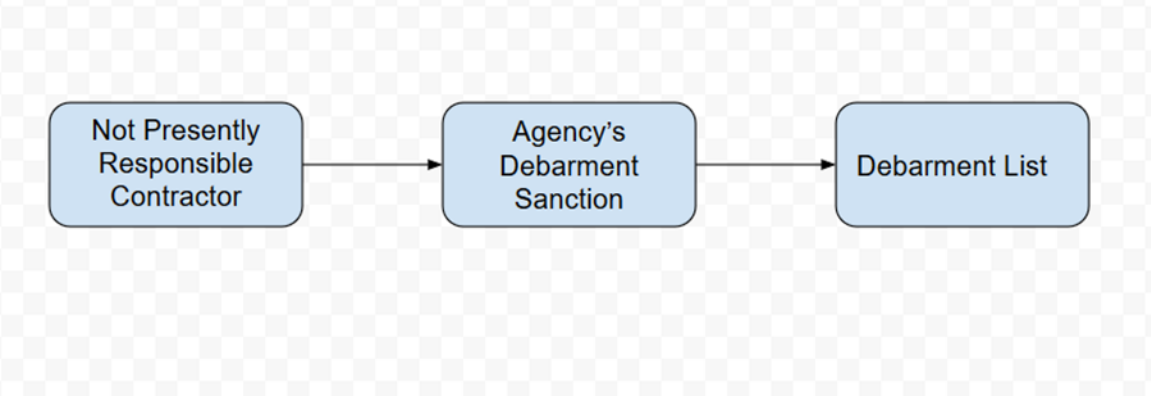

Figure 3. Debarment sanction system.

The literature survey I conducted showed that debarment sanction had become a standard practice in many international public agencies and government agencies. For example, multinational development banks (MDBs) such as African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank, and The World Bank keep debarment lists of unscrupulous individuals and companies as part of their debarment sanctions regime (Søreide et al., 2016). Debarment actions taken by these banks are mutually enforceable (Levy & Wagner, 2018). In other words, a debarred contractor in one MDB may face debarment

for the same violation for the same misconduct by other MDBs parts (ABA, 2018). Any contractor debarred by one MDB may be debarred by the other MDB participating in the cross-debarment systems (Levy &Wagner, 2018). The World Bank approved the "Mutual Enforcement of Debarment Decisions" agreement with major regional MDBs in 2010 to prevent corruption and fraud in public procurement (Nesti, 2014).

The United Nations (UN), through its Contractor Review Committee applies debarment procedures to protect its interests by ensuring it does business with responsible and competent contractors (UN Procurement Manual, 2020). Each UN organization uses debarment sanctions to protect the UN's interests. Public procurement hinges on public funds' expenditure and thus requires good governance (Shakya, 2015). Organization for Economic Cooperation and Development [OECD] (2016) asserted that a keystone of good governance is the integrity that leads to public trust. The role of good governance in government procurement is to promote the rule of law and upholding principles of procurement such as value-for-money, transparency, anti-corruption, competition, efficiency, and due process (Beth, 2005; Cutler, 2018; OECD, 2005; Passas, 2007; Veiga, Schapper, Calvo-Gonzalez, & Berroa, 2011). For example, in Nigeria, the federal government enacted the Public Procurement Act in 2007 to ensure efficient and effective good governance in public procurement (Williams-Elegbe, 2015). The Nigerian government is set to improve values for its citizenry by buying goods and services based on best practice public procurement principles and procedures, which include a formal debarment sanction regime. Debarment sanction is a public procurement regulation the US government uses as the last resort to protect the government's interests (ISDC, 2019).

Figure 4 summarizes the number of debarment actions by the U.S. government from 2009 through 2017. The United States government has implemented 10,982 debarments between Fiscal Year 2009 and 2017 (ISDC, 2019).

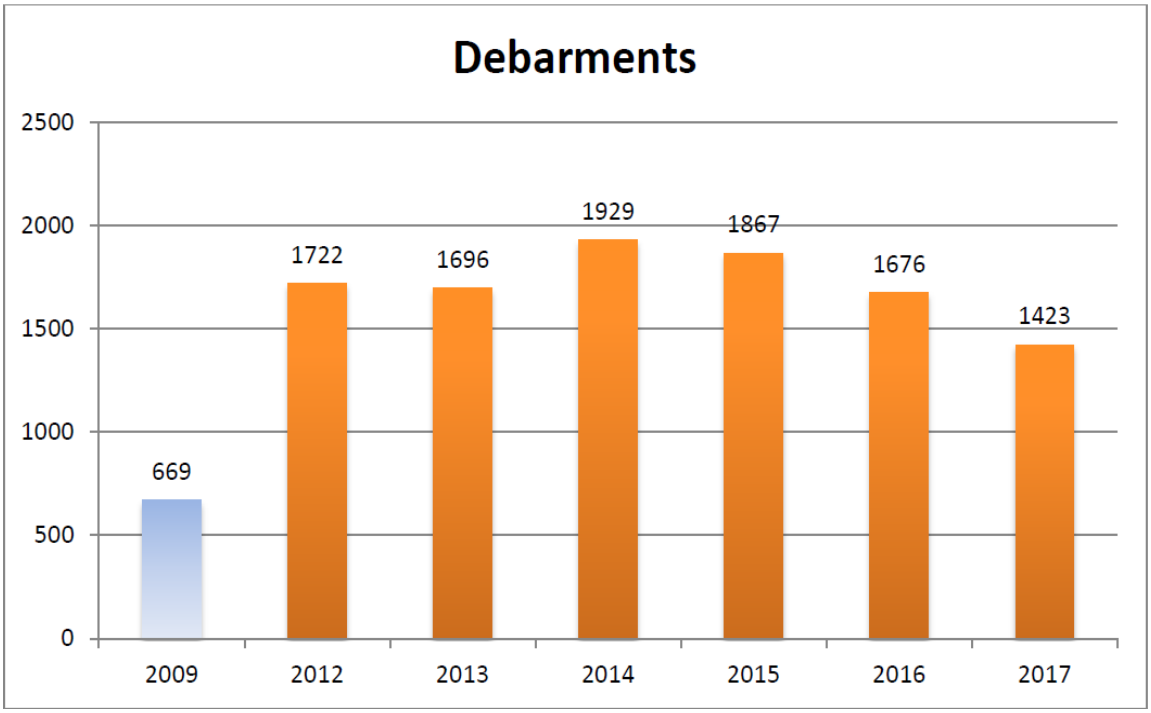

Figure 4. Bar chart for the U.S. debarments from 2009-2017. From "The Interagency Suspension and Debarment Committee Annual Report to Congress," by U.S. Interagency Suspension and Debarment Committee, 2018 (https://www.acquisition.gov/sites/default/files/page_file_uploads/Control%20ISDC%20FY%202017%20Report_Final_07_31_2018%20-2.pdf). In the public domain.

Further literature review showed evidence of corruption in the form of fraud, waste, and abuse in the public procurement (OECD, 2016; Schooner, 2004; Shakya, 2015). The prevalence of public procurement corruption compelled the government to mandate debarment as either an administrative or statutory remedy to prevent public

procurement corruption (Williams-Elegbe, 2019). Debarment remedies are consistent with other goals of public procurement regulations, like transparent public procurement procedures and sanctions, in the prevention of fraud, wastes, and abuse such that government supplies and contracts are awarded to only eligible contractors.

There is a consensus among authors that a debarment sanction system is a useful tool for protecting the government from awarding contracts to fraudulent, unethical, and nonperforming contractors (Dubois, Swan, & Castellano, 2015; Shaw & Totman, 2015; Søreide, 2017; Williams-Elegbe, 2019). As such, any contractor listed in the debarment list is automatically disqualified from receiving contract awards from the government for a specified period. However, in certain limited instances, exclusion may not be automatic if there is a compelling need for an excluded contractor's services or products, such as military supplies (GAO, 2005, 2012).

Definition of Debarment List

Many organizations, authors, and scholars have attempted to define or describe a debarment list in different terms. Debarment list, otherwise known as the Excluded Parties List System (EPLS), is an electronic register of companies excluded from the United States government's procurement and nonprocurement activities (GSA, 2019). It is a government-wide compilation of contractors that are ineligible to receive contracts in federal procurement and nonprocurement programs (GSA, 2019). Manuel (2012) defined the debarment list as a list of excluded contractors, which "contracting officers must check before awarding a contract" (p. 2). Harker and Castellano (2017) described the debarment list as a list of companies excluded from government procurement activities.

The debarment list is a government repository containing information about contractors determined to be ineligible to receive contracts from the government (Levy & Wagner, 2018).

Furthermore, GAO (1987) described a government agency's debarment list as a list of contractors that are excluded from doing business with a government agency. Some international organizations, such as Transparency International (2013), described the debarment list as a web-based "blacklisting register" (p. 1). The register is available online for the wider public to consult. MDBs such as The World Bank Group (2020) described the debarment list as a list of firms and individuals that cannot receive contract awards from the World Bank-financed contracts for a stipulated period. The World Bank's fraud and corruption policy prescribe that firms that have violated the fraud and corruption provisions of the Clause 1.14 of The World Bank Procurement Guidelines or the Clause 1.12 of The World Bank Consultants Guidelines must be blacklisted (The World Bank Group, 2020).

A debarment list typically contains information about contractors that are excluded on procurement grounds and nonprocurement grounds. So also, it contains information on contractors debarred under federal statues (statutory or mandatory debarment) or contractors debarred under FAR (discretionary or administrative debarment). According to GAO (1987), debarment list has two primary purposes: (a) to provide a single and comprehensive listing of contractors debarred by government agencies from receiving contracts, and (b) to inform agencies about government

debarment actions so that the agencies will ensure that they award contracts to only responsible contractors.

Having reviewed extant literature on the debarment list, for this study, I will define a debarment list as a list that contains the names and other information about nonresponsible contractors excluded from receiving future government contracts due to prior violations of government laws or regulations and failure to perform under their contractual obligations.

Functions of Debarment list

- Transparency. A debarment list is a transparent product of a due process of debarment proceeding outcomes and their reasons (Dubois, Swan, & Castellano, 2015).
- Public data. It provides data on procurement frauds, waste, and abuse risk patterns against present and future award of contracts. This data can be analyzed to make statistical predictions appropriate for resolving policy issues on the debarment regime.
- Accountability. It underscores the importance of monitoring timelines of the debarment actions of an agency. Public and private organizations or individuals can gain insights into an agency's accountability efforts to mitigate procurement frauds.
- Tracking. Every potential contractor is vetted through a debarment list. A contractor listed in it would not be eligible to participate in business activities with government agencies and other public agencies.

- Deterrence. The debarment list makes information about punishment cognitively inexpensive. It increases the probability of being caught and thus serves as a deterrence to would-be procurement violators.

Effect of Debarment List

- Public listing. An agency posts the name and address of a debarred contractor, including information about the exclusion in a debarment list (FAR 9.404(b)), which may be published online for public viewing (Levy & Wagner, 2018).
- Procurement activity. A debarred contractor is immediately prohibited from receiving contracts and subcontracts from the government agencies (FAR 9.405(a) (Levy & Wagner, 2018).
- Nonprocurement activity. A debarred contractor may be excluded from participating in government nonprocurement transactions such as loans, grants, subsidies, and cooperative agreements (ABA, 2018).
- Contractor. An individual debarred will likely face unemployment with a federal government agency or will be unable to maintain or obtain a security clearance. Ineligibility to receive contracts from the government due to debarment action can have negative business consequences for the debarred corporation. Debarment may negatively impact the reputation of a corporation listed in the debarment list. Debarment action on an entity may be imputed to other entities or affiliates engaged in a joint venture (FAR 9.406-5(c) (Levy & Wagner, 2018).

- Reciprocity (Cross debarment). Many state agencies have provisions for reciprocal debarment across other states and federal levels of government. In cross debarment practice, a local government may not award contracts to a contractor currently active in the state or federal debarment list (ABA, 2018). For example, Section V(i) of the City of Chicago Debarment Rules stipulates that the City may debar a contractor that is actively debarred by "any other government agency."

Evolution and History of Debarment List in Public Contracting

The authority for debarment in government procurement in the United States evolved from the concept of responsibility (Gallagher, 1988; Gantt & Panzer, 1957; Levy & Wagner, 2018; Miller, 1955; Swan & Castellano, 2015). According to Manuel (2012), the federal government based its contracting practices on a concept of doing business with qualified "responsible bidders" (p. 1). The broad scope of the concept of responsibility in procurement implies that a contractor must be a responsible bidder to receive federal contracts (Gantt & Panzer, 1957; Levy & Wagner, 2018). This responsibility standard, which emerged as the process to enforce statutory social and economic policy, continues today, especially in public contract laws and regulations (ABA, 2018; Cibinic & Nash, 1986). Eventually, a debarment list evolved from the government debarment process.

In the 1780s, debarment actions slowly became one of the major tools the U.S military departments utilized to ensure that the military awarded future contracts to only contractors that were sufficiently responsible for fulfilling statutory and contractual

obligations (Nagle, 1999). Historical records showed that Robert Morris, the Superintendent of Finance under the Continental Congress, introduced a methodological competitive contracting process to supply foods to the Continental Army in Philadelphia in 1781 (Nagle, 1999). This contracting process entailed advertising for contractors to submit bids, opening sealed bids on the scheduled date, and negotiating and accepting the best offers. The story is that Superintendent Morris used an appropriate methodology to select contractors that are "men of substance and talents" (Nagle, 1999, p. 50) to perform the excellent and reliable business of food supplies to the Continental Army. In today's government, this criterion connotes the selection of competent contractors who possess a degree of "responsibility" (Nagle, 1999, p.50). During this period, no literature reported that the government kept records of contractors that were found to be irresponsible.

In the 1880s, the U. S. government officially introduced legislation to back the responsible bidding concept in government procurement (Levy & Wagner, 2018). The United States Congress enacted the Act of July 5, 1884, which requires the executive branch to award contracts to the lowest "responsible" bidder and reject any other bids (Levy & Wagner, 2018). There was no practice of keeping an official list of contractors excluded from doing business with the government until after World War 1 in 1918 (Gallagher, 1988). At this period, government contracting officers were probably advised by word of mouth on their contractors' performance or reputation (Gallagher, 1988).

In the 1920s, the concept of contractor's responsibility gradually accelerated to an idea of debarment in government contracting (Horowitz, 1983). The Budget and Accounting Act of 1921 established the General Accounting Office (GAO), and in the

years that followed, the Comptroller General had relied on the use of contractor's performance bond to compensate for the inadequate performance of a low bidder (Horowitz, 1983). However, the first published opinion on debarment emerged in 1928. The Comptroller General of GAO acknowledged that a performance bond was not enough to protect government and thus proposed debarment action in a written memo (7 Comp. Gen, 1928) that:

> When the interests of the United States require the debarment of a bidder, no question will be raised by this office with respect thereto, provided the length of the time of debarment is definitely stated and not unreasonable, and the reasons for the debarment, with a statement of the specific instances of the bidder's dereliction, are made of record and a copy thereof furnished the bidder and this office (pp. 547-548).

The highlight of the 1920s is that it was the period where the word "debarment" was first mentioned in public contracting.

In the 1930s, debarment action was expressly introduced into government contracting through several Congressional Acts to curtail contractors' failure to meet specific statutory and economic requirements (Levy & Wagner, 2018). For example, the Buy American Act of 1933 was the first statute that contained an express debarment provision that requires contractors to use American-produced materials, for which a violation may result in a three-year debarment length from government contracts (41 U.S.C. §§ 10a-10d). Other statutes that contained express debarment provisions are the amended David-Beacon Act of 1931, which requires construction contractors to pay their

workers prevailing wages as determined by the Secretary of Labor [(40 U.S.C. § 276a-2(a)] and Walsh-Healey Public Contract Act of 1936, which mandates inclusion of specific stipulations in manufacturing and supply contracts that exceed $10,000 [(41 U.S.C. § 35)]. The Walsh-Healey Public Contract Act directs the Comptroller General to compile names of persons or firms on a list and distribute it to all government agencies [(41 U.S.C. § 6504(a)]. These Acts prescribe that any contractor that violates the terms in the statutes may face a length of debarment spanning three years [(41 U.S.C. § 6504(b)]. This period became the first time an official debarment list was introduced into the debarment process in government contracting.

In the 1940s, Congress continued its endorsement of federal contracting's responsibility standard (Gallagher, 1988). The government mandated military and civilian agencies to specifically contract only with responsible bidders (Gallagher, 1988). The Armed Services Procurement Act of 1947 stipulates "responsible" bidder provision. It established the Armed Services Procurement Regulations (ASPR), which stipulates debarment procedures for military agencies. The Act initially provides that a contractor that violates the regulations is subject to a debarment length for a period up to 3 years or 5 years, depending on the nature of the violation but later limited to 3 years for all violations (10 U.S.C. §§ 3202 et seq.) as administered by Department of Defense (DOD). Likewise, The Federal Property and Administrative Services Act of 1949 stipulates debarment procedures for civilian agencies. The Act established the General Service Administration (GSA), which maintained "responsible" bidder provision in its regulations (40 U.S.C. §§ 471 et seq or 41 U.S.C. § 354). The Armed Services

Procurement Act of 1947 and The Federal Property and Administrative Services Act of 1949 became the forerunners to standardized debarment regulations (Gallagher, 1988; Levy & Wagner, 2018). During this period, under ASPR, each military department maintained its own debarment list (34 C. F. R. § 400.303). For example, the Adjutant General of the U. S. Army maintained and published a confidential list of bidders to whom awards will not be made (U.S.C. 81.13(g)(4) sup.1941), pursuant to Army's procurement authority. The United States Navy maintained a "List of Ineligible Contractors" (34 C.F.R. 31.133) Supp.1947). The U.S Air Force maintained a "List of Ineligible Contractors and Disqualified Bidders" (32. C. F. R. Ch. IV, Sec. 1000.303). In this period, the debarment list of one military service also applied to other military services [(32 C. F. R. §§1.604, 1.605-1 (1954)].

In the 1950s, improvements on debarment regulations became a more visible priority of the government. A study conducted by Gantt and Panzer (1957) confirmed the problem of several debarment lists across different agencies. It recommended that a central list should be maintained by one agency on behalf of all federal government agencies. The Reorganization Act of 1949 became operational and implemented as a Reorganization Plan. GSA promulgated the Federal Procurement Regulations (FPR) in 1959 with express debarment authority and superseded the then-existing GSA regulations. The GSA regulations prescribe that an executive agency's debarment list should be made applicable to the other agencies (41 C.F.R. Secs. 1-1.601 to 1-1.608 (1960), while it also served as a basis for debarment within DOD (32 C.F.R. sec.

400.604-1(c) (Supp. 1954). This was the period causes for debarment were officially enumerated in government debarment regulations.

In the 1960s, there was an exponential growth in government contracting with concerns about fairness in the use of debarment actions (U.S. Department of Interior, n.d; Gantt & Panzer, 1963; Levy & Wagner, 2018). In 1962, the Administrative Conference of the United States (ACUS) extensively reviewed the debarment process, found procedural deficiencies, and made nine recommendations to make debarment more effective (Gantt & Panzer, 1963). Furthermore, the Contract Work Hours and Safety Standards Act 1962 contained statutory debarment authority to protect workers' right to prevailing wages (40 U.S.C. 327). Some statues created by Congress that contained debarment provisions include the Clean Air Act of 1963 to regulate air pollution (42 U.S.C. § 7606) and Service Contract Act of 1965, which governs wages working conditions on service contracts over $2,500 (41 U.S.C. §§ 351-358, 1984). In this period, a violation of these statutes by contractors may result in a three-year debarment from receiving government contracts.

During the 1970s, many government agencies adopted their debarment procedures, which resulted in variations in procedural safeguards in debarment actions. Notably, in 1971, the Department of Housing and Urban Development (HUD) issued regulations that contained debarment procedures that applied to not only contractors but also to grantees (2 C.F.R. §12424). The Clean Water Act of 1972 also contained debarment regulations that stipulate the debarment of persons or firms found in violation of this Act (33 U.S.C. §1 1368). These variations necessitated the government efforts to

address fairness and due process in debarment processes. In 1972, the Commission on Government Procurement (COGP) recommended that the Office of Federal Procurement Policy (OFPP) should conduct an expert policy review of debarment proceedings (Nagle, 1983). In 1974, GSA and DOD amended their existing debarment regulations to guarantee effective due process for evidentiary hearing from contractors who oppose their proposed debarment. This was the period COPG advised OFPP to propose policies to establish uniformity of procedure to limit the length of debarment to 3 years for all government agencies and publish a consolidated debarment list for all government agencies (40 Fed. Reg. 22,318-19).

In the 1980s, the federal government faced increased political pressure to curb fraud, waste, and abuse in government contracting (Levy & Wagner, 2018). U.S Congress criticized some agencies, especially DOD, for lack of aggressiveness in using debarment remedies to protect government interest from dishonest contractors. For example, in 1981, the Senate Governmental Affairs Subcommittee on Oversight of Government Management recommended that the federal government issue regulation for a government-wide suspension and debarment. In 1982, OFPP released a policy paper that established substantive guidelines for uniform government-wide debarment [(47 Fed. Reg. 28,854 (July 1, 1982)]. Upon implementation, any executive agency's debarment actions were honored by all other agencies (GAO, 1987). GAO developed a Consolidated List of Suspended, Debarred, and Otherwise Ineligible Contractors (the Consolidated List) to compile and disseminate the Consolidated List to government agencies. In 1982, GSA began to publish the Consolidated List, which is distributed to federal agencies

every month. Based on the OFPP report, Congress enacted the Defense Acquisition Act (DAR) mandating military departments to honor debarments issued by federal agencies.

In 1983, GSA began to issue a weekly supplement to the Consolidated List to improve reporting timelines (GAO, 1987). Eventually, in 1984, ASPR and FPR were unified and designated as the Federal Acquisition Regulation (FAR), thus strengthening debarment authority (48 Federal Register 42,102, 42,142). In early 1984, GSA developed a computerized method of keeping the information on the Consolidated List, which was accessible only within GSA. In September 1986, GSA developed a short-term method that granted some agencies with on-line computer access to its weekly updates with a view to closing potential information loopholes (GAO, 1987). In 1986, the President's Blue Ribbon Commission on Defense Management recommended the use of specific criteria (e.g., mitigating factors) needed for consideration to determine if a contractor is "presently responsible." Also, in 1986, President Bush signed an Executive Order 12549, which created the Interagency Suspension and Debarment Committee (ISDC), as an advisory body to discuss current suspension and debarment related issues and assist in developing unified Federal policy. The Packard Commission and ISDC recommendations provided policy background that reinvigorated the government debarment list. For example, in 1987, GSA implemented a government-wide access system for the Consolidated List and rebranded later as Excluded Parties List (EPLS System). In this period, improvements in the debarment list became consolidated in several agencies while Congress and many agencies devoted more attention to debarment regulations.

In the 1990s, there were issues about the deficiencies and loopholes in the management of the Consolidated List because GSA had some difficulty providing timely information about the list to government agencies. A report by GAO (1987) had found that some debarred contracts continued to receive contracts from the government contrary to the provisions of FAR. For example, some agencies' contracting officers unknowingly awarded contracts to contractors that had been debarred by other agencies because the contracting officers did not receive timely monthly updates of the Consolidated List from GSA. On March 17, 1997, GSA made the Consolidated List from Federal Procurement and Non-procurement Programs available on the World Wide Web and accessible via the Internet, yet still continued to publish the monthly paper version of the list (GSA, 1997).

In the 2000s, debarment regulations continued to expand in scope (Søreide, 2015); thus, each agency managed its own debarment list. The debarment mechanism was strengthened and given more visibility because GSA launched the Excluded Parties Lists System (EPLS) in 2007 (Martin, 2019). EPLS, among other things, listed the firms or individuals debarred, suspended, proposed for debarment, or otherwise declared ineligible from participating in Federal procurement programs (GSA, 2019). In 2009, GAO evaluated EPLS and reported that some excluded parties on the EPLS were still receiving federal contracts.

In the 2010s, debarment policy became more significant to Congress due to increases in federal spending on contracts and reports that showed agencies awarded contracts to excluded contractors (GAO, 2011; Lipowicz, 2009). The government stepped up the incremental improvements it had made on the debarment process in the previous

years to address various loopholes that had been discovered in the EPLS and to otherwise increase its efficiency and effectiveness. Based on GAO's (2009) report, GSA determined that EPLS was inefficient to provide adequate search capabilities and launched a new system known as the System for Award Management (SAM) on May 29, 2012 (Murray, 2019). SAM consolidated seven existing government systems into one entity: the Federal Procurement System (FPS) and the Catalog of Federal Domestic Assistance (CFDA), Central Contractor Registration (CCR), Federal Agency Regulation (FedReg), Online Representatives and Certification Application (ORCA) and the Excluded Parties List System (EPLS; GSA, 2012).

At the beginning of the 2020s, GSA implemented several significant updates to SAM. GSA enhanced SAM with kick-out timer for better security and to deter fraud (SAM, 2020). Currently, if an authenticated user is inactive for 30 minutes, SAM will automatically log out the user.

From the above historical background, government debarment list evolved from when contracting officer relied on the word of mouth to determine a presently responsible contractor or otherwise, through when not presently responsible contractors were listed on a piece of paper and to this current dispensation when not presently responsible contractors are listed electronically on a web-based platform (SAM). According to information published on GSA's (2020) website, SAM is a "public-accessible web-based directory of individuals and organizations that are not permitted to receive federal contracts or assistance from the United States government." The policy is that any company currently doing business or willing to do business with the U.S. government

must be sure not to enter SAM. Consistently, GSA introduces improvements to SAM to meet the demand of immediate debarment actions. SAM is the official federal government debarment list currently in use at the time of publishing this study.

Table 1

Historical Landmarks in the Evolution of Debarment List

Year	Debarment event	Debarment list
1884	Act of July 5, 1884 requires the executive branch to award contracts to lowest responsible bidder and reject other bids	Word of mouth
1928	First published opinion on debarment by the Comptroller	No official debarment list
1933	Congress enacted Buy American Act. The first statute to contain express debarment provisions.	No official debarment list
1935	Congress enacted Davis-Bacon Act. It amended debarment	No official debarment list
1936	Congress enacted the Walsh-Healey Public Contacts Act. Debarment mandated as a penalty for violating the Act.	Yes. First time debarment list was introduced (paper-based)
1947	Congress enacted the Armed Services Procurement Act whose regulations stipulate suspension and debarment	Debarment list can be exchanged in the military
1949	Congress enacted the Federal Property and Administrative Services Act. It maintained the "responsible" bidder clause	Each agency maintained its own paper-based debarment list
1959	GSA promulgated the Federal Procurement Regulations. It supersedes its regulations with express debarment authority	Agencies must state causes for debarment in debarment list
1962	The Administrative Conference of the United States (ACUS) reviewed debarment processes.	Paper-based list
1963	Congress enacted the Clean Air Act. It mandates debarment of persons found in violations of the Act	Paper-based list
1972	The Clean Water Act stipulates debarment of persons	Paper-based list
1978	Armed Services Procurement Regulations renamed as the Defense Acquisition Regulation. Debarment retained	Paper-based list
1981	Senate sub-committee on Oversight of Government Management recommended national debarment regulations	Paper-based list
1982	Office of Federal Procurement Policy released a policy for substantive uniform government-wide debarment	Consolidated List distributed to agencies
1984	Debarment authority strengthened by the creation of the Federal Acquisition Regulation (FAR)	Consolidated List was computerized for GSA only
1986	Intragency Suspension and Debarment Committee established to discuss agencies' debarment issues	GSA granted agencies limited access to Consolidated List
1987	GSA implemented a government-wide Consolidated List	Computerized list
1997	GSA made Consolidated List available to the public on the Internet. Available for free viewing and download.	First time Consolidated List became accessible online
2007	Debarment gained more visibility because GSA launched the Excluded Parties Lists System (EPLS)	Consolidated List replaced with EPLS
2011	Congressional Committee on Debarment and GAO examined agency practices in debarment actions	EPLS continued as Web-based list and accessible online
2012	Seven procurement systems consolidated into one large system known as Systems for Award Management (SAM)	EPLS replaced with SAM (Enhanced web-based list)
2020	SAM enhanced with kick-out timer to deter fraud. It will time out if inactive for 30 minutes	SAM currently has better search capabilities online

Debarment Regulation

According to FAR (2014), Part 9, Subpart 9.4, suspension and debarment programs are established to sanction firms or violators from obtaining contracts from the government. FAR provides government-wide policies on debarment sanction and allow agencies the flexibility to make specific debarment decisions. Studies showed that the federal government's debarment program is also replicated and codified into laws at other levels of government (Williams-Elegbe, 2012). Levy and Wagner (2018) reported that states and many local governments, such as cities or counties, further adopted debarment laws and regulations that are based on ABA's Model Procurement Codes. Although states and cities used their discretions to design debarment laws and regulations that suit their specific interests and needs, they conform to ABA's Model or FAR (Levy & Wagner, 2018). A contractor certifies that it has not been excluded, debarred, or suspended from and is not, in any other way, ineligible to participate in any state or federal governmental program.

The City of Chicago Debarment System

The City of Chicago has formal procedures for debarring contractors that are based on criminal indictments or court convictions (City of Chicago, 2020). The City adopted federal debarment laws and regulations and ABA's Model Procurement Code for State and Local Government. The City of Chicago maintains a list of Debarred Firms and Individuals (see Appendix), that is recorded. The list contains the various types of egregious offenses or violations attributed to the name of firms or individuals who are either suspended or debarred from doing business with the City under Section 1-23-020

of the Municipal Code. Under the Code, City's Contracting Officers are required to check the City's debarment list to ensure that debarred contractors are not awarded City contracts. In most situations, City officials are also required to check SAM before the award of contracts. Contractors willing to do business with the City are expected to attest to the State of Illinois-mandated debarment certification under 30 ILCS 500/50-10(e). Also, a contractor must certify that neither contractor nor any of contractor's directors, employees, representatives, and subcontractors who may deliver supplies or provide services under City contract are presently debarred by the U.S. government or by any federal government agency (13 C.F.R. § 145). Under debarment rules, indicted firms or individuals are debarred from engaging in business activities with the government. At the federal government level, statutory debarment published in Federal Register is typically determined by a criminal proceeding conducted by a court of the United States (ABA, 2018).

The concept of the City's debarment practices originated from the federal government. The City of Chicago Debarment first adopted its Debarment rules on December 14, 2005. The current Debarment Rules, which were last updated on March 28, 2012 (as at the time of publishing this study) prescribe policies and procedures governing the debarment of contractors by the Chief Procurement Officer (CPO) under the authority of Chapter 2-92 of the Municipal Code of the City of Chicago and Chapter 65 of the Illinois Compiled Statutes in general and under the authority of 65 ILCS 5/8-10-11 and 8-10-16 (City of Chicago, 2020). Debarment is a determination by the CPO that a contractor or a person or entity is not responsible and is not eligible to enter into contracts

with the City (City of Chicago, 2020). As it is in the federal government, the City's debarment's goal is not to punish contractors, but to protect the City from unscrupulous prospective contractors. Debarment allows the City to ensure that it does business only with "responsible" contractors and subcontractors. Also, the City of Chicago procedures for debarment takes into cognizance essential due process safeguards of notice that allow contractors facing debarment action opportunity to present the matter in opposition (Levy & Wagner, 2018). A contractor may avoid City's debarment action if the contractor can demonstrate to the City that the purported wrongdoing was an isolated instance and will likely not happen again. The City does not maintain a web-based database of excluded contractors but maintains a debarment list that is published online for easy public access.

The City of Chicago's Debarment List Features

Section 1(b) of the City of Chicago Debarment Rules provides for the listing of debarred contractors known as "List of Debarred Firms and Individuals" (City of Chicago, 2020). The current list is a 12-page record of debarred contractors in PDF last updated by the City on May 1, 2019 and retrieved for analysis for this study on August 13, 2020. For this study, the City's List of Debarred Firms and Individuals will be referred to as the "Debarment List." The City's Debarment List consists of the following:

Entity/individual. The name of the business organization being excluded from receiving contracts from the City. The name includes the type of business operated by the contractor and the contractor's primary address.

Debarment date. The official date the CPO determined a contractor to be nonresponsible and not eligible to receive future contracts from the City, either as a prime

contractor or subcontractor. The contractor's debarment became active on this date.

Length of debarment. The length identifies the specified period a contractor is debarred from doing business in the best interests of the City. The length of debarment under discretionary debarment depends on the facts and the circumstances of a given allegation (Levy & Wagner, 2018, p. 182), while the length of debarment under statutory debarment is dictated by law (FAR 9.406-4 (2). FAR 9.406-4(c) and allows agency officers to reduce the debarment period. For example, upon written request to the agency, a debarred contractor may have its "debarment length reversed or reduced provided there is a new material evidence or judgment reversal" (ABA, 2018, p.184-185).

Reasons for debarment. The reasons for debarment are the City's specific grounds for debarring a contractor due to serious violation that it affects the contractor's present responsibility (City of Chicago, 2020). There must be a reason for debarment (Williams-Elegbe, 2016). The reasons for debarment such as conviction of or civil judgment for the commission of fraud or criminal offense relating to City contracts and other misconduct showing lack of honesty as enumerated in Section V of the City's Debarment Rules. Also, under Section VI, Paragraph 6.01, the City enumerates a set of potential mitigating factors upon which the contractor has the burden of demonstration to satisfy the CPO that the debarment may not be required.

The City of Chicago's Debarment Procedures Leading to Debarment List

The provision for debarment procedures as stipulated in Section VII of the City's Debarment Rules. The City commences a debarment process when a contractor is convicted or alleged to have engaged in any of the violations enumerated in Section V of

the City's Debarment Rules. (Section V[a-i]). The information is referred to as the CPO, who shall review the seriousness of the violation and decide to propose debarment and designate a Debarment Officer to coordinate the debarment process until completed (Section VI. Par. 6.01). The CPO shall issue Notice of Proposed Debarment (the "Notice") to the contractor (Section VI. Par. 7.02). The Notice is to inform the contractor that debarment is being proposed, reasons for the proposed debarment stating that the contractor may submit written opposition to the proposed debarment within 30 days after receipt of the Notice, administrative contact and copy of City's debarment's rules (Section VII. Par 7.02[a]-[f]). At this stage, the contractor is still eligible to receive contracts from the City, but such a contract may be terminated if the contractor is later debarred (Section VII. Par. 7.04[a][2]).

The existence of any of the enumerated causes for debarment does not necessarily mean that the suspected contractor should receive an automatic debarment sanction. The CPO has the discretion to determine if the cause(s) for debarment are less serious or sufficiently serious (Section VII. Par. 7.04[b]). On the one hand, if the CPO determines that the cause for debarment is less serious, the CPO may ask the contractor to provide Show Cause letter that may lead to an administrative settlement between the City and the contractor (See the definition of administrative settlement). On the other hand, if the causes for debarment are sufficiently serious, and the evidence supporting debarment is compelling, the CPO may decide to issue the contractor a restraining letter. The contractor has ten days after the Notice or ten days after the date of the letter of restraint, whichever is later, to contest the letter of restraint (Section VII. Par. 7.04[c]). At this

stage, the contractor is not eligible to receive new contracts from the City unless cleared in the debarment process.

Within 30 days of receipt of the Notice, the contractor is expected to submit all supporting documents to a designated City Officer, containing all the facts and arguments upon which the contractor contests the proposed debarment. The contractor or City may require an in-person hearing to decide if debarment is necessary. Hearings shall be conducted with fairness and transparency (Section VII. Par. 7.04[h][3]). After review of all relevant facts and written records presented by the contractor, the CPO shall reach a determination to either grant the contractor's opposition to the proposed debarment or summarily decline the contractor's opposition to the proposed debarment. The CPO may grant administrative settlement to a contractor whose misconduct the CPO found to be improper but may not warrant full debarment (Section VII. Par. 8.04). However, the CPO shall issue a formal letter of debarment to a contractor whose opposition to proposed debarment is declined at the in-person hearing (Section IX, Par. 9.02). The CPO will conclude the debarment proceedings by listing the name of the debarred contractor in the City's debarment list published in the City's website (Section IX, Par. 9.04). Figure 5 depicts the City's debarment procedures. This figure does not include every possible scenario in the City's debarment procedures but summarizes the main route through which a contractor is listed in the City's Debarment List.

Figure 5. Flow chart for the City of Chicago's debarment procedure. Constructed from information gathered from "Debarment Rules," by City of Chicago, 2020 (https://www.chicago.gov/content/dam/city/depts/dps/RulesRegulations/DebarmentRules4-24-15.pdf). In the public domain.

Predictor and Outcome Variables

Predictor Variables

The predictor variables in this study are the location of contractor, debarment fraud, and length of debarment.

Location. This variable refers to the official place of business registration of contractors currently doing business with the City. All contractors are expected to furnish to the City their street address. Contracting with a contractor with only a post office address in the profile is a potential indicator of the procurement fraud flag (Caulfield, 2014; Wight, 2012).

Debarment fraud. Debarment fraud is an egregious fraud that an agency determines to cause exclusion of a contractor from doing business with the government in a specified period (FAR, 2014). For this research, the two significant categories of debarment fraud I identified in the literature are procurement fraud and nonprocurement fraud.

Procurement fraud. Procurement fraud is misconduct that threatens the integrity of procurement (OECD, 2016). Several authors have identified different procurement fraud types that are perpetuated by contractors in public procurement (Caulfield, 2014; Miranzo, 2017; Randon & Randon, 2015). The World Bank categorized procurement misconduct subject to debarment into five categories viz corrupt, fraudulent, collusive, coercive, and obstructive practices (The World Bank, 2016). These types of procurement frauds are also evident in the City of Chicago Debarment List. I reviewed the City's Debarment List by taking a cue from The World Bank's approach to procurement

misconduct classification. I found that procurement frauds committed by debarred contractors are in five major categories as follows:

Set-aside program frauds. The set-aside program is a procurement solicitation program that is exclusively reserved for small businesses and minority women (Stanberry, 2004). The City's set-aside programs are Minority-owned Business Enterprise ("MBE"), Woman-owned Business Enterprise ("WBE"), Disadvantaged Business Enterprise ("DBE"), Business Enterprise owned by People with Disabilities ("BEPD"). These set-aside programs were established by the City to ensure that a fair proportion of the City's contracts are awarded to small businesses and minority women. Section V(d) of the City Debarment Rules prescribes that "making or attempting, or causing to be made or attempting to cause to be made, any false, deceptive, or fraudulent material statement in any application to obtain, expand, or continue certification as an MBE/WBE/BEPD/DBE" is a ground for debarment. The City has debarred some contractors who deceptively or fraudulently classified themselves as "women-owned" to qualify for City's set-aside contracts. For example, the City's OIG Report (2020) found that a contractor knowingly used its company as a minority "pass-through" to gain City contracts. A review of the City's Debarment List showed the City of Chicago debarred 35 contractors for set-aside program frauds in the fiscal years under review in this study.

Contract frauds. This type of fraud is a willful misrepresentation of contract proposals or performance committed by a contractor to deceive the City. Contract frauds span many fraudulent schemes such as bid-rigging, kickback, or contractor inducement of procurement personnel with bribes to seek illegal favors in contract awards or approval,

conflict of interest, defective quality and purchase order abuse (Rose-Ackerman & Palifka, 2016; Yang, 2016). The City of Chicago debarred 40 contractors for contract frauds in the fiscal years sampled in this study.

Phony companies to solicit contracts. This type of fraud is a deliberate effort to establish fake companies to induce fraudulent payments from the City. Fictitious companies that do not provide goods and services may be entered into the database to siphon money from the City Treasury. The City of Chicago debarred 15 contractors for operating on phony companies in the fiscal years sampled in this study.

Forgery or falsification of documents to seek contracts. This fraud is a willful submission of forged tax documents or false statements regarding a material element of certification to seek City contracts. The City of Chicago debarred 11 contractors for forgery in the fiscal years sampled in this study.

Fraudulent invoices/voucher reimbursement claims. This type of fraud refers to knowing the submission of fake invoices or vouchers for goods or services not delivered. It also includes fraudulently inflating contract fee for fictitious claims. The City of Chicago debarred four contractors for contract invoicing in the fiscal years sampled in this study.

Nonprocurement fraud. Under government Nonprocurement Rule (NCR), a nonprocurement is any transaction, which is not a procurement contract. Examples of nonprocurement transactions include but are not limited to grants, cooperative agreements, loans, scholarships, fellowships, contract assistance, loan guarantees, subsidies, insurances, payments for specified uses, and donation agreements [(2 CFR §

180.970 (a)]. The government expands its budget through nonprocurement programs and activities, which are to "provide socio-economic and other assistance to the American public" (Levy & Wagner, 2018, p. 32). The City of Chicago operates nonprocurement programs as a cornerstone of the City's economic and social policy that supports its citizens and residents. Therefore, a City contractor determined to have violated the terms of these nonprocurement programs may be convicted for criminal or administrative fraud and face the City's debarment action. The City of Chicago debarred 33 contractors for nonprocurement frauds in the fiscal years sampled in this study.

Figure 6. Bar chart for types of fraud

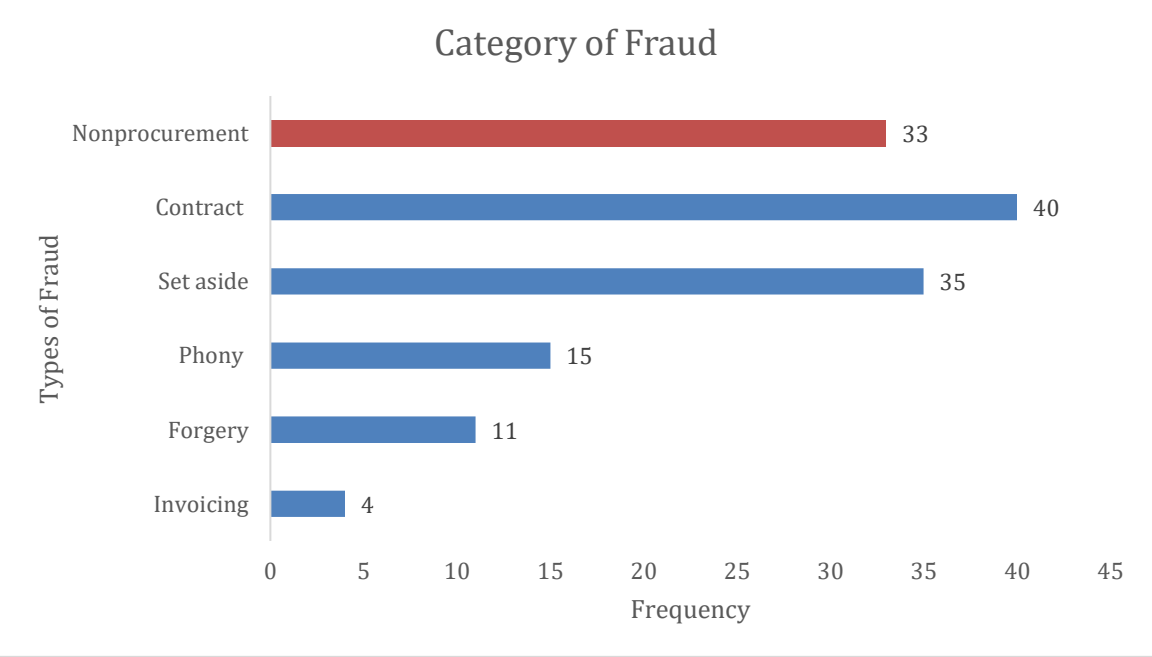

Figure 6 is a bar chart illustrating the types of fraud I identified in the City's debarment list. For clarity, I used the red bar to distinguish nonprocurement fraud from procurement frauds.

Length of debarment. Length of debarment is the exclusion period a contractor

is debarred from receiving contracts from the government (Levy & Wagner, 2018). Manuel (2012) explained that the degree of a debarment's cause would determine the length of debarment, which may exceed three years. However, heads of agencies have the prerogative to waive administrative exclusions if there are compelling reasons (Manuel, 2012). The length of debarment will typically match the gravity of the cause (GAO, 2012). Cerrone et al. (2018) found that the deterrent effect of debarment on contractor's collusion increases with the length of debarment. The history or pattern of conduct of a contractor may be used to determine an appropriate length of debarment (City of Chicago, 2020). For example, the City typically classifies length of debarment as either permanent or lifetime. A contractor would receive permanent debarment if the City determines that the contractor willfully registered the company to commit specific or any procurement fraud, while lifetime debarment is for other violations.

Outcome Variable

An outcome variable is a dependent variable a researcher makes an attempt to explain or predict (Polit & Beck, 2018). The outcome variable in the study is the business entity. Debarment data from The World Bank (2019) report showed that 48 corporations and individuals were debarred in the fiscal year 2019. This variable is the form of a contractor's business type, either a firm (corporation) or an individual (sole proprietor).

Business entity. A prospective contractor is expected to register with an appropriate government agency, the type of business organization that meets its business needs and legal obligations. Contractors willing to do business as a legal business entity with the City must formally receive registration approval from the Illinois Secretary of

State government, Illinois Department of Revenue (IDOR). These contractors must register with the United States Internal Revenue Service (IRS) to receive a Federal Tax Identification Number. That is, an Employer Identification Number (EIN) either as a firm or a sole proprietary. The business entities in this study are firm and individual.

Firm. For this study, a firm is a business entity where two or more persons run a business together with mandated management and reporting obligations and in which the entity's finances are separated from personal finances **(**Garner, 2004). A firm can be a Limited Partnership (LP), Limited Liability Partnership (LLP), Limited Liability Corporation (LLC), Corporation, or Not-for-Profit Corporation (NFP).

Individual. Contractors who registered as a sole proprietorship can do business as an individual. A sole proprietorship is a business entity in which an individual owns all assets and liabilities and operates in a personal capacity (Garner, 2004).

Summary and Conclusions

In this chapter, I presented the historical and integrative review of the literature on the evolution of the debarment list and the current use of the debarment list in public contracting. Specifically, I discussed the City of Chicago Debarment procedures and how the City's contractors can be listed in the debarment list. There is a critical gap in the literature that requires ample study on debarment practices: understanding the linkage between the predictive relevance of a debarment list and the effectiveness of debarment deterrence on government contractors (ISDC, 2017). I chose the deterrence theory as a predictive theory to provide an organizing structure for the study's framework. By considering literature consensus on classical deterrence theory, this study views

contractors as rational and that when debarred following a violation or crime that is certain, swift and severe, a contractor is less likely to repeat the crime and also the message is sent to other contractors showing the consequences of a commission of a crime (Purpura, 2019). A review of relevant literature confirmed that debarment sanction could provide enough deterrence to keep fraudulent contractors from doing business with the government (Cerrone et al.; 2018; Peirone, 2018). Although an extensive search of the literature did not reveal any model that investigated the predictive applications of the debarment list, however, I developed an original conceptual framework: The Debarment Deterrence Model. The C-T-E technique (Fawcett, 1999) was adapted to facilitate understanding of the same variables in the debarment list, the deterrence theory, and how the theory would be operationalized in this research.

In Chapter 3, I use the model to examine how the relationship among location of contractor, debarment fraud and the length of debarment can explain and predict the deterrent effects of debarment sanction on contractors (firms and individuals) doing business with the City. This model is essential because this study utilized the City's debarment list data to predict contractors' fraud probabilities by focusing on variables that show a tendency towards procurement fraud—a way of demonstrating that the ability to deter public procurement fraud may be subject to the predictive capability of relevant fraud data in a debarment list. The study's research design, methodology, data analysis plan, and threats to validity are discussed in Chapter 3 in greater detail.

Chapter 3: Research Method

Introduction

The research method in this chapter includes a description of the research design, rationale, philosophical assumption, population, sample, sampling procedures, source of data, data collection, and data analysis plan. The quantitative nonexperimental design I selected was appropriate because it enabled me to assess whether the independent variables of contractors listed in the debarment list can determine the statistical probability of contractors (firms or individuals) that may be debarred from the array of contractors doing business with the City. I also describe threats to validity, ethical procedures, and the summary of this chapter.

Research Design and Rationale

Research Design

Research design is the specific plan researchers adopt to answer a research question and strategies to strengthen the integrity of a study (Polit & Beck, 2017). Research design describes how the research is structured to show how the alignment of major components of the research addresses the central research question. Trochim (2020) described research design as a "glue" that holds all the research elements together. According to Cooper and Schindler (2003), research design establishes the plan for data collection, measurement, and analysis.

I chose a quantitative nonexperimental design to analyze secondary data to answer the research question of this study. Quantitative research involves the use of numerical or statistical data to explain, predict, investigate relationships, describe current

conditions, or examine possible impacts or influences on designated outcomes (Walden, n.d.). In this study, I looked for statistical probabilities. Hence, the use of a quantitative approach was consistent with the purpose of the study to investigate variables leading to "precise measurement and quantification" (Polit & Beck, 2017, p. 415).

The three types of quantitative research design available to carry out this research were experimental, quasi-experimental, and nonexperimental (O'Sullivan, Rassel, Berner & Taliaferro, 2017). Experimental design allows a researcher to exercise control over all variables that may affect an experiment's result. The classic experimental design applies a randomized posttest design to test an experimental group and a control group (O'Sullivan et al., 2017). I used nonprobability sampling in this study, which did not require an experimental group nor a control group. Therefore, experimental design was not relevant to this study. A quasi-experimental design is like a classical experiment except that the quasi-experiment subjects are chosen randomly by identifying a group of subjects comparable to the group involved in the test (O'Sullivan et al., 2017). In this study, I neither selected subjects randomly nor chose a comparison of two groups, so a quasi-experimental design that utilizes comparison group pretest and posttest design was not appropriate. I adopted a nonexperimental design for this study because, as Polit and Beck (2017) suggested, this design is most appropriate for research in which the "independent variables inherently cannot be manipulated" (p. 146). I did not manipulate the independent variables in this study. I designed the study to take a snapshot of the predictive application of a debarment list using a statistical analysis of data to answer a descriptive research question. This selection is consistent with Johnson's (2014)

argument that a nonexperimental design does not require much control or intervention, and it is "perfectly fine to answer descriptive and normative questions" (p. 67). Moreover, the purpose statement and research question propounded in this study suggest the need for secondary data, so this study's design included secondary data analysis. The goal of using secondary data analysis was to gain easy access to a reliable government debarment data that would otherwise take several months and several dollars to collect.

Operationalization of constructs. I used the following specific variables from the City's debarment list:

Dependent variable. Business entity is the dependent variable in this study. It is the type of business organization operated by a contractor. It is a nominal dichotomous variable categorized as "firm" and "individual" for this study.

Independent Variable 1. Location of contractor is one of the independent variables in this study. It is the City of business registration of a contractor. It is a nominal dichotomous variable categorized as "City of Chicago" and "other cities" for this study.

Independent Variable 2. Debarment for fraud is also an independent variable in this study. It is a fraud committed by a contractor based on administrative decisions, convictions, or civil judgments. It is a nominal dichotomous variable categorized as "procurement fraud" and "nonprocurement fraud" for this study.

Independent Variable 3. Length of Debarment is the third independent variable in this study. It is the exclusion period of a contractor from government business and a

continuous ratio variable measured in years. For this study, the length of debarment is the period between the date of debarment through the end of FY19.

Philosophical Assumption

Leavy (2017) suggested six philosophical worldviews that can be used to conduct public administration research as follows: post-positivism, constructivism, transformative, pragmatism, critical realism, and art-based intersubjective. Because this study's research design was a quantitative approach, I took the stance of post-positivism as my philosophical belief to explain my chosen research approach. Post-positivism is a philosophical interpretative framework that underscores determining empirical observation and measurement and theory verification (Babbie, 2013; Creswell, 2016). As a post-positivist, I approached this research to identify the causes that influence outcomes by developing numeric measures of objective reality. Post-positivism recognizes the existence of an orderly reality that can be studied objectively (Polit & Beck, 2017). For this study, the objective reality is the City of Chicago's Debarment List that currently exists. To overcome the philosophical paradigm's constraints, using post-positivism as an interpretative framework for this study allowed me to avoid bias. At the same time, I applied flexible choice of methods to match the purpose of the study, the research design, and the needs of the setting population to conduct the research.

Rationale

The secondary data I analyzed were from the Debarment List of the City of Chicago, which is currently archived on the City's website and publicly accessible online. The advantages of using secondary data are to permit a researcher to answer the research

questions in less time and with lower costs than when using other data collection methods like in-depth interviews, surveys, and observation (Nishishiba, 2014; Saunders, Lewis, & Thornhil, 2016). A significant disadvantage was that I did not have control over how to verify the quality and accuracy of the secondary data (see Nishishiba, 2014). This disadvantage implies that I analyzed a pre-existing data, which I did not collect. However, this disadvantage did not pose a serious concern for this study because it is unlikely for the City to publish names of debarred contractors in the City's official Debarment List if these contractors were not actually sanctioned with debarment by the City. The City may not have established its Debarment List for research purposes; however, my research was an attempt to demonstrate that the ability to deter public procurement fraud may be subject to a debarment list's predictive capability. I resolved that secondary data analysis would strengthen this study, whence the relationships among variables in previously unanalyzed sample may lead to findings that can advance research on the debarment list. Trzesniewski, Donnellan and Lucas (2011) argued that "archived data tend to have higher quality than could be obtained by individual researchers" (p. 4). The choice of an archived data for this study's analysis finds support in the argument of these authors. All the relevant data suitable for analysis to answer this study's research question are available in the City's debarment list. Hence, the list is appropriate, valid, and reliable.

In this study, I evaluated the individual and collective extent that the three predictor variables predict the outcome variable. In other words, I used the predictor variables to develop a statistical model to predict the outcome variables and assessed

which of the predictor variables contributes to statistical significance to the model. Adding another predictor variable to the model may improve model misfit (Osborne, 2015). There was no model misfit during statistical analysis. Therefore, I did not use a confounder variable to influence substantial changes in the coefficients of other variable in this study.

Methodology

Population

The target population is the entire statistical population under consideration in research (Nishishiba, 2014; Polit & Beck, 2017; Simon & Goes, 2013). The target population in this study was the debarred contractors in the City's debarment list from FY 2008 through FY 2019. It is not necessary to investigate all levels of the American government. Thus, I selected the City of Chicago's municipal government as the sampling frame within the public sector.

Sampling and Sampling Procedures

Sampling is a process of selecting a subset of the population to represent the target population (Polit & Beck, 2017; Simon & Goes, 2013). The subset selected to participate in this study is known as a "sample" (Nishishiba, 2014, p. 74). This study's nonprobability sampling plan was designed to yield a representative sample in which cases selected from the target population shared common characteristics (Patton, 2015). This plan was consistent with Johnson's (2014) argument that sampling that is based on a researcher's judgment using very precise criteria "makes sense" (p. 156). For the research

objective, research question, and design I chose for this study, the sampling plan included the following steps:

1. identify the target population,
2. state the eligibility criteria, and
3. select the sample. (Nishishiba, 2014)

I used this sampling plan to seek out the best sample size for the study that could produce the best data such that the research results were the direct results of the sampled size (McNabb, 2018; Patton, 2015).

The sampling procedure involved cleansing the unit analysis of data in the sample. I removed contractors listed with incomplete information in their unit of analysis. For example, I removed contractors with no information about their location in the Debarment List or whose specific reason for debarment was not stated. MacInnes (2017), suggested that the subset in a unit analysis of the data should have similar characteristics to all other cases in the dataset. The cases I selected represented a specific information-rich sample that could illuminate relevant group patterns. The idea was to make sure that I analyzed the City's Debarment List with all the relevant data for each contractor in the sample. The sampling errors can be reduced if all the units selected already have known characteristics representing the study population (O'Sullivan et al., 2017). These authors also suggested that the calculation for sampling statistics does not apply to nonprobability samples. This study's design was a nonexperimental design; therefore, the use of power analysis to calculate sample size was unnecessary.

Table 2

Categories of Variables and Coding

Debarment data	Code identity	Variable type	Measurement scale	Coding numerical
Busines entity	Entity	Dependent	Nominal	Individual = 0 Firm = 1
Location of contractor	Location	Independent	Nominal	Other cities = 0 Chicago = 1
Debarment fraud	Fraud	Independent	Nominal	Nonprocurement = 0 Procurement = 1
Length of debarment	Length	Independent	Continuous	Not applicable

Table 2 shows that the study's data consist of one dependent variable that is dichotomous and measured on a nominal scale, two independent variables that are dichotomous and measured on a nominal scale, and one independent variable that is measured on a continuous scale. I coded these variables as 0 or 1, with 1 representing the occurrence of the event of interest and 0 representing the absence of the event of interest.

Procedures for Data Collection

The data collection for this research only included secondary data. The study's primary source of data was the "PDF List of Debarred Firms and Individuals" of the City of Chicago (2020). I retrieved the City of Chicago's Debarment List from the Internet. This list is a publicly accessible document available on the City's website (https://www.chicago.gov/content/dam/city/depts/dps/DebarredFirms/DebarredList05262020.pdf). I saved all document data retrieved online for the analysis in a folder in my

password-protected computer and secure online system, which only me had the access to. The storage was to increase the reliability of the data analysis and applicability of my findings, so that the evidence can be reviewed directly by future investigators, who may provide a substantial base for the assertions I made in this study. I did not need to seek permission from the City to access or obtain the Debarment List because the data I used for the study was already published for the public on City's official website. I analyzed only data that is publicly accessible online. The Debarment List is a list of contractors the City has determined to be ineligible to receive contracts from or do business with the City, having followed the provisions for debarment procedures as stipulated in Section VII of the City's Debarment Rules (see Figure 5). I resolved that the data were sufficiently reliable for the purpose of this study because it is a data inspired by real-life administrative decisions.

The data collection period began in the middle of July 2020, shortly after I obtained Walden University Institutional Review Board (IRB) approval. I persistently spent one week searching the Internet for publicly published debarment lists that matched this research sampling threshold. I did Internet searches looking for debarment lists in all the fifty states in America. I searched up to 120 municipal or county governments, and 20 federal agencies. I also searched for the debarment list of multinational organizations such as the World Bank and the UN. I selected the debarment list that I retrieved from the City of Chicago website because this list has the most comprehensive information relevant for this study. Some of the debarment lists I searched did not list the reasons for debarment. Knowing the reason(s) for debarment was crucial for me to objectively

analyze all relevant information and data I needed to statistically determine the magnitude of the unknown odds or probabilities of contractors – firms, and individuals (see the conceptual framework on page 33). Also, I noticed that some government entities listed few contractors in their debarment lists. A small sample size would be too small for this study. The strength of this research was enhanced by selecting the City of Chicago's Debarment List because it has a considerable sample size and the most comprehensive information relevant to the study. Therefore, the City's Debarment List has a high reputability; it is the official records of contractors sanctioned with debarment by the City. The Debarment List presents the best source of the dataset for this study.

Data Analysis Plan

I utilized the Statistical Package for Social Sciences (SPSS, Version 25) to conduct the data for analysis. The dataset that I had created in EXCEL Spreadsheet was downloaded into SPSS software. SPSS is very suitable to analyze the data because the software was designed to perform several statistical tests and analyses and present graphical illustrations (Suresh, 2015). I applied binomial logistic regression as the statistical tool to test the hypothesis and predict answer to the research question of this study. Binomial logistic regression provides models of the probability of an event occurring based on the values of the independent variables (Osborne, 2015) and gives estimates of the probability of an event to occur (Laerd Statistics, 2017). Logistic regression is used to classify observations by estimating the probability of an observation in a category (Warner, 2013). Also, I used binomial logistic regression to explore how well the independent variables predict a categorical outcome (Pedhazur, 1997; Warner,

2013). The length of debarment is a continuous variable, while all other variables chosen for the study from the City's Debarment List are categorical variables, and they were coded in SPSS. This study's objective was to explore the cumulative effect of all the predictor variables together on the odds and probability of the outcome variable being debarred. I assessed predictor variables individually and collectively, to check their statistically significant contributions to predicting the dependent variable. Data analyses included in the study were descriptive statistics, omnibus tests, model summary, and calculation of odds ratio. Odds ratios measure the direction and strength of an association (Simeon & Goes, 2013) and can be deduced from the logistic equation. I presented the relevant tables and charts to report the results of the data analysis.

Logistic Regression Assumptions

I ensured that this study met all the assumptions of logistic regression analysis based on my study design and measurements, the data fit the binomial logistic regression model. The assumptions are stated below:

- The data has a binary dependent variable (Harrell, 2015).
- The data has more than one independent variable measured at either a continuous or nominal scale (Harrell, 2015).
- There is evidence of a dependence of observations among the data and the categories of the dependent variable, while the nominal independent variables are mutually exclusive and exhaustive (Harrell, 2015).

- There were 138 cases per independent variable, which are more than the recommended number of 50 cases per independent variables (Menard, 2010; Tabachnick, & Fidell, 2014).
- The continuous predictor variable has a linear relationship with the logit transformation of the outcome. (Box & Tidwell, 1962; Laerd Statistics, 2017). In this study, the interaction between the length of debarment variable and its log odds was obtained through Bonferroni procedure to validate this assumption.
- The study data did not show multicollinearity; that is, no independent variables that are highly correlated with each other (Osborne, 2015).
- There were no significant outliers or highly influential points (Osborne, 2015).

Threats to Validity

Validity is the degree to which a measure evaluates what it purports to measure (Fink, 2014). I used the binomial logistic regression analysis as the statistical test for this study to evaluate the level to which the measure forecasts the dependent variable. The rationale to reduce the threats to the internal and external validity of data adequately was to ensure meaningful interpretation of data of this study.

Internal Validity

The potential threat to internal validity is the accuracy of statistical regression analysis. However, to reduce any threat to the internal validity of the test, I assessed the data and confirmed that it met all the assumptions of a binomial logistic regression to provide the answer to the research question. These assumptions included the assumptions

about independence of observations and inclusion of important covariables (Harrell, 2015). The assumption of linearity presupposes a linear relationship between the continuous independent (length of debarment) and the logit transformation of the outcome. I validated the assumption of linearity by using Box and Tidwell Test (Box & Tidwell, 1962), and Benferonni procedure (Laerd Statistics, 2017). The assumption of goodness of model fit was validated by Hosmer and Lemeshow Test (Hosmer & Lemeshow, 1989).

External Validity

The potential threat to the external validity of data in the study is the reputability of the City's Debarment List because I did not create the data and the City did not establish the list specifically for this study. However, this threat of internal validity posed no threat to this study because it is doubtful to have a contractor listed in a debarment list without due process and official sanction. The Debarment List is the official records of contractors sanctioned with debarment actions by the City pursuant to Section VII of the City's Debarment Rules.

Ethical Procedures

I received approval from the Walden University IRB (Approval no. 07-10-20-0228450) before collecting data for the study. The Debarment List is a public document, which the City published on the Internet for public information. The data in the Debarment List are neither anonymous nor confidential. The data I collected are from public records, which I used for research purposes only. The data do not contain sensitive personal information; ethical protections are not serious issues in this study. Therefore, I

did not need to seek permission from the City to gain access or to obtain the Debarment List because I analyzed only data that was already available to the public.

Summary

In this chapter, I presented the methods and design that I used to conduct the study as well as the target population and sampling for the study. I also presented how I analyzed the preexisting data that cover the City of Chicago's debarment decisions during 12 Fiscal Years (FY 08 through FY 19). The core of chapter 4 includes study's research question, hypothesis, data collection and a detailed analysis of the findings, which was obtained through the application of both descriptive and inferential statistical techniques.

Chapter 4: Results

Introduction

The purpose of this quantitative secondary data analysis was to examine the predictive relationship of the effects of location of contractor, debarment fraud, and length of debarment on business entities (registered as firms or individuals) that were debarred from receiving contract awards from a municipal government in the State of Illinois. Using binomial logistic regression, I analyzed the Debarment List of the City of Chicago to determine the statistical odds and probability of contractors that may be debarred from the array of contractors doing business with the City. In this chapter, I provided the results of binomial logistic regression analysis of the secondary data from the City of Chicago's Debarment List I used to test the hypothesis and answer the research question. I included tables and figures to illustrate the results. Tables and figures enhance data presentation (Dietz & Kalof, 2009; Durbin, 2014). I also provided details of descriptive and inferential statistics and a summary of findings in this chapter.

Research Question and Hypotheses

In this study, I addressed the following research question and hypotheses:

What predictive relationship, if any, do a contractor's location, debarment fraud, and the length of debarment on contractors listed in the debarment list have as to whether they were debarred from receiving contracts from the City of Chicago municipal government in the State of Illinois?

H_o: The debarment fraud of a debarred contractor listed in the debarment list of the City of Chicago will not be a significant predictor of business entity when compared

to the contractor's location and the length of debarment. H_o: μLocation = μFraud = μLength.

H_a: The debarment fraud of a debarred contractor listed in the debarment list of the City of Chicago will significantly increase the ability to predict business entity when compared to the contractor's location and the length of debarment. H_a: μLocation ≠ μFraud ≠ μLength.

Data Collection

The data I analyzed for this study, which were publicly accessible online, were preexisting and covered up-to-date City of Chicago's debarment decisions compiled in the City's official Debarment List, pursuant to Section VII of the City's Debarment Rules. After I received IRB approval, I analyzed data for 12 fiscal years from the City of Chicago Debarment List of debarred contractors, which I downloaded from a publicly accessible document published on the City of Chicago's website (https://www.chicago.gov/content/dam/city/depts/dps/DebarredFirms/DebarredList05262020.pdf). I identified the total universe of the City's 158 debarment actions for all fiscal years, but I selected the City's debarment actions for fiscal years 2008 through 2019 for this study. Each fiscal year ran in a cycle from July 1 through June 30. For example, FY 2019 was the period July 1, 2018 to June 30, 2019. I was inspired to select 12 fiscal years because the number "12" is the natural number of months in a year. The data were screened, cleansed, and transposed into a dataset spreadsheet before I exported it into SPSS v.25 for analysis. I coded the dichotomous variables of contractor's location, debarment fraud, and business entity before I performed the data analysis. There were no

discrepancies in data collection from the plan presented in Chapter 3. The total number of debarred contractors extracted for this study was $N = 138$.

Description of the Study Sample

The debarment data analyzed for this study covered fiscal years 2008 through 2019. The City took the highest debarment action in 2009 ($n = 39$) but no debarment action in 2017 ($n = 0$). The visual displays of the data are represented by frequency distribution in Table 3 and a bar chart in Figure 7.

Table 3

Descriptive Statistics for City of Chicago Debarments From FY08 - FY19

Fiscal year	Frequency	Percent	Valid percent	Cumulative percent
2008	8	5.8	5.8	5.8
2009	39	28.3	28.3	34.1
2010	4	2.9	2.9	37.0
2011	37	26.8	26.8	63.8
2012	17	12.3	12.3	76.1
2013	8	5.8	5.8	81.9
2014	1	.7	.7	82.6
2015	12	8.7	8.7	91.3
2016	1	.7	.7	92.0
2017	0	0	0	92.0
2018	8	5.8	5.8	97.8
2019	3	2.2	2.2	100.0
Total	138	100.0	100.0	

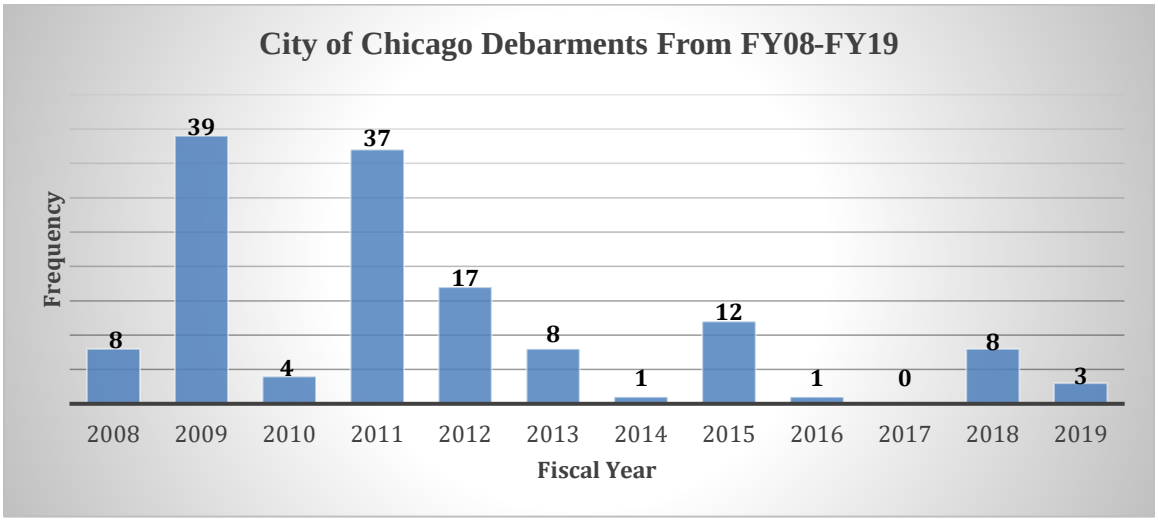

Figure 7. Bar chart for the City of Chicago debarments (FY08 - FY19).

Study Results

Baseline Descriptive Statistics

In this study, I examined the predictive capability of the location of contractor, debarment fraud, and length of debarment in the Debarment List of the City of Chicago on the functional outcome of the business entities registered to do business with the City, such as the probability of getting a business entity debarred. I generated descriptive statistics based on business entity, location of contractor, debarment fraud and length of debarment to show the characteristics of the debarred contractors, shown in Table 4. The total number of debarred contractors in the sampled data was $N = 138$.

Table 4

Descriptive Statistics for Business Entity, Location of Contractor, and Debarment Fraud

Variable	Category	Frequency	Percent	Valid percent	Cumulative percent
Business entity	Individual	82	59.4	59.4	59.4
	Firm	56	40.6	40.6	100.0
Location	Other cities	58	42.0	42.0	42.0
	Chicago	80	58.0	58.0	100.0
Debarment fraud	Nonprocurement fraud	33	23.9	23.9	23.9
	Procurement fraud	105	76.1	76.1	100.0

Among the registered business entities, the City of Chicago debarred more individuals than firms. Eighty-two contractors who registered as individuals represented 59.4% of contractors debarred by the City, whereas the City debarred 56 contractors who registered as firms (40.6%). The data showed that 52% (n = 80) of contractors are in the City of Chicago, whereas 42% (n = 42) are located outside the City of Chicago. A government debarment lists consists of contractors that are debarred for procurement fraud and nonprocurement fraud (Levy & Wagner, 2018). In this study, procurement-related debarments are categorized as procurement frauds while those that are not procurement related are categorized as nonprocurement fraud. The City recorded 105 (76.1%) procurement frauds and 33 (23.9%) nonprocurement frauds. Fraud in public procurement manifest in different forms (Caulfield, 2014). For this study, I identified five subcategories of procurement fraud in the City of Chicago's debarment list and classified other debarments that are not procurement related as nonprocurement fraud. The total

nonprocurement debarments were *n* = 33. Table 5 indicates the descriptive statistics of type of frauds identified in the City's debarment list. The mode is the case with the largest frequency or percentage in a distribution (Bryman & Bell, 2015; Warner, 2018). Contract fraud has the highest frequency of 40 and represents the mode in the distribution, and accounts for 29% of the sampled population. Meanwhile, invoicing fraud has the least count of 4, which is 2.9%.

Table 5

Descriptive Statistics for Type of Frauds

Types of fraud	Frequency	Percent	Valid percent	Cumulative percent
Contract	40	29.0	29.0	29.0
Phony company	15	10.9	10.9	39.9
Forgery	11	8.0	8.0	47.8
Set-aside	35	25.4	25.4	73.2
Invoicing	4	2.9	2.9	76.1
Nonprocurement	33	23.9	23.9	100.0

Inferential Statistics

This study was about finding the associations and predictive measures of location of contractor, debarment fraud and length of debarment regarding debarred contractors. I utilized binomial logistic regression, $\alpha = .05$ (two-tailed), to analyze the data having confirmed that the data in this study met all the assumptions associated with the use of logistic regression analysis (see Data Analysis Plan in Chapter 3). Logistic regression analysis was performed in SPSS to assess the significant predictors of the outcome variable (business entity) from theoretically based variables (location, fraud, and length)

obtained from the debarment list. The results of inferential statistics are presented in six steps below to address the hypothesis and the research question.

Step 1. Data coding. SPSS calculated cases and apportioned coding to the variables. I began the analysis with an inspection of the data to check for any missing case. This was to ensure that the appropriate cases were reported. Table 6 shows that cases used in the analysis were $N = 138$. There was no missing case, suggesting that the data were suitable for analysis.

Table 6

Case Processing Summary

Unweighted cases		*N*	Present
Selected cases	Included in analysis	138	100.0
	Missing cases	0	.0
	Total	138	100.0
Unselected cases		0	.0
Total		138	100.0

Table 7 displays the coding for the dependent variables. The internal SPSS coding for the variable Firm = 1 and Individual = 0. The main event predicted in this study was debarment for firm. Debarment for individual was used as the reference category. An event coded with higher numerical number is predicted by SSPS (Laerd Statistics, 2017).

Table 7

Dependent Variables Codings

Original value	Internal value
Individual	0
Firm	1

Table 8 is for the Categorical Independent Variable Coding. It shows coding for the categorical variables and counts for analysis. The categories had good counts, a situation that is desirable for logistic regression (Osborne, 2015). In the row for debarment fraud, the number of occurrences (frequency) for procurement fraud category was $n = 105$ and coded = 1, whereas the frequency for nonprocurement fraud was $n = 33$ and coded = 0. The parameter coding = 1 for the $n = 80$ contractors located in Chicago City, while the parament coding = 0 for $n = 58$ contractors that are located across other cities outside the City of Chicago. I interpreted values coded =1 in this study.

Table 8

Categories Variables Codings

Original value		Frequency	Parameter coding (1)
Debarment fraud	Nonprocurement fraud	33	.000
	Procurement fraud	105	1.000
Location	Other cities	58	.000
	Chicago	80	1.000

Step 2. Baseline model analysis. SPSS calculated the baseline model analysis. Only the constant was added to the model without any predictor variable. Table 9 displays the classification of the predictor variables with no predictor variable added to

the model. This baseline model suggests an overall "guess" of 59.4% (82/138) percentage to predict every case that a business entity registered as an individual will be debarred while only 40.6% (56/138) of contractors registered as firms will be debarred.

Table 9

Classification Table

			Predicted		
			Business entity		Percentage correct
	Observed		Individual	Firm	
Step 0	Business entity	Individual	82	0	100.0
		Firm	56	0	.0
	Overall percentage				59.4

Constant is included in the model and the cut value is .500

Table 10 is for Variables in the Equation, which SPSS calculated as "Block 0 Model. This model analysis included only the constant (intercept). I used this baseline model to compare with another model when all the predictor variables were added (see Table 16).

Table 10

Variables in the Equation

		B	S.E.	Wald	*df*	Sig.	Exp(B)
Step 0	Constant	-.381	.173	4.480	1	.028	.683

The description of parts in Table 10 are below:

B - means Beta, which is the estimated logit coefficient (Warner, 2013).

S.E. - means standard error of the coefficient (Warner, 2013).

Wald - means the test statistic for each predictor variable in the model (Warner, 2013)

df - means degrees of freedom, which is the number of independent values that a statistic is based and calculated as (*N*-1) (Frankfort-Nachmias & Leon-Guerrero, 2018).

Sig. - means the significance level (p-value) of the coefficient (Laerd Statistics, 2017).

Exp(B) - is the exponential of B, which represents the odds ratio of the independent variable (Laerd Statistics, 2017)

Step 3. Model fit calculated. I used SPPS to calculate the overall statistical significance of the model to test the hypothesis. Table 11 displays the values for the Omnibus Test of Model Coefficients. SPSS calculated "Block 1 Model." The Omnibus tests predict categories when not compared to independent variables and show how poor the model can predict the categorical outcomes. The corresponding "Sig." value to consider for the Chi-Square of 17.263 with a degree of freedom of 3 is from the row described as "Model." This model is a test of the hypotheses stated in Chapter 1. The result of this model test showed that the chi-square showed strong significance (Chi-square = 17.263, $df = 3$, $p < .001$).

All three independent variables collectively proved to be statistically significant to predict the outcome variable. Therefore, the null hypothesis is hereby rejected while I accepted the research hypothesis to be true.

Table 11

Omnibus Tests of Model Coefficients

		Chi-square	df	Wald
Step 1	Step	17.263	3	.001
	Block	17.263	3	.001
	Model	17.263	3	.001

Table 12 displays the goodness of fit test that indicates the adequacy of the model. How a logistic regression model tests whether the model is an adequate fit to the data (Hosmer, Lemeshow, & Sturdivant, 2013). The result of Hosmer and Lemeshow test is not statistically significant as $p = 0.448$ (> .05). This test result in an evidence that the model is not a poor fit.

Table 12

Hosmer and Lemeshow Test

Step	Chi-square	*df*	Sig.
1	7.857	8	.448

Step 4. Valence explained. SPSS calculated the summary of how the variation in the dependent variable is explained by the model. Table 13 provides a summary of the index of goodness of fit that explains the magnitude of variation in the dependent variable. -2log likelihood statistic measures how poorly the model predicts outcomes (Osborne, 2015). A smaller value indicates a better model (Laerd Statistics, 2017). The R^2 explains approximately how much variation in the outcome is explained by the model (Warner, 2013). Researchers have the option to select Cox & Snell R^2 or Nagelkerke R^2

to calculate the explained variation (Warner, 2013). However, I adopted the result of Nagelkerke R^2 because it can calculate values up to 1 unlike Cox & Snell R^2. The (pseudo-R2) suggests that this logistic regression model analysis explains roughly 15.9% of the variation in the dependent variable.

Table 13

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	169.118	.118	.159

The result of the Hosmer-Lemeshow test in Table 14 shows that the closer the coherence between the observed values and expected probabilities, the better the model fit (Frees et al., 2014). This model indicates that the model has a good fit.

Table 14

Hosmer and Lemeshow Test Contingency Table

	Business entity = Individual		Business entity = Firm		
	Observed	Expected	Observed	Expected	Total
1	12	12.552	2	1.448	14
2	12	12.167	2	1.833	14
3	12	9.349	2	4.651	14
4	10	7.794	4	6.206	14
5	4	6.068	7	4.932	11
6	5	6.288	7	5.712	12
7	7	6.684	7	7.316	14
8	8	7.075	7	7.925	15
9	7	6.580	7	7.420	14
10	5	7.443	11	8.557	16

Step 5. Category prediction. SPSS calculated the category prediction with the correct classification from the predictor variables. Table 15 is a classification table with the predictor variables added to the model. The overall classification rate is now 62.3% compared to 59.4% in the null model in Table 9. The improvement indicates that the model has higher predictive strength.

Table 15

Classification Table[a] With Predictors Variables added

			Predicted		
			Business entity		Percentage correct
	Observed		Individual	Firm	
Step 1	Business entity	Individual	52	30	63.4
		Firm	22	34	60.7
	Overall percentage				62.3

a. The cut value is .500

This study used a logistic regression to build predictive models as a function of predictors. The results of characteristics calculated in Table 15 is explained below:

Percentage accuracy in classification (PAC) = 62.3%. There is an improvement in the overall prediction of the dependent variable because independent variables were added to the model.

Sensitivity is 60.71%. This is the percentage of occurrences (firms) correctly predicted and actually observed as firms. It means [34/ (22 + 34)] % = 60.71% of firms debarred were also predicted by the model to be contractors that registered as firms.

Specificity is 63.4%: This is the percentage of nonoccurrences (individuals) correctly predicted and actually observed as individuals. In this case, the model correctly predicted [(52/ (52 + 30)] % = 63.41% of contractors debarred were individuals.

The false positive value rate is the percentage of predicted cases which were incorrectly classified as firms. SPSS calculated it as [100 x (30 ÷ (30 + 34)] = 46.88%. This is the percentage of predicted debarred firms which are incorrect but actually observed as individuals.

The false negative rate is the percentage of cases which were incorrectly classified as individuals. SPSS calculated it as [100 x (22 ÷ (52 + 22)] = 29.73%. This is the percentage of predicted debarred individuals which are incorrect, but they were actually observed as firms.

Step 6. Variables in equation. SPSS calculated the primary binomial logistic regression equation. Table 16 provides the summary of the main logistic regression model. The Business Entity group code = 1 for Firm, while the code = 0 for Individual. The "B" (Beta) coefficients are used to predict the probability of a business entity occurring. The Wald statistic tests statistical significance of each independent variable to the model and it is calculated under the "Sig" column. The only predictor variable that was significant in the model is debarment fraud at $p = 0.001$. That is, Wald = 11.408, $p <$ .001 was a significant predictor of business entity debarment. The odds ratio for the predictor variables is indicated as Exp(B). According to Laerd Statistics (2017), odds ratio is the change in the odds of the even of interest for one-unit change in the independent variable. The odds ratios were calculated to determine the relative likelihood

of predictability for business entity debarment. It is the estimated change in odds of procurement fraud relative to nonprocurement along with a 95% confidence score for the odds ratio. The model showed that procurement fraud is 6.86 times more likely to cause debarment of a business entity registered as a firm than nonprocurement fraud (the study's reference category).

Table 16

Variables in Equation for Model

							95% C.I. EXP(B)	
Variable	B	S.E.	Wald	*df*	*Sig*	Exp(B)	Lower	Upper
Location(1)	.345	.385	.805	1	.370	1.412	.664	3.002
Fraud(1)	1.926	.570	11.408	1	.001	6.860	2.244	20.974
Length	.011	.073	.023	1	.879	1.011	.876	1.167
Constant	-2.256	.892	6.392	1	.011	.105		

Note. Debarment fraud is calculated for procurement fraud relative to nonprocurement fraud.

Answer to the Research Question

The research question aimed to examine the influence of the predictive effect of the predictor variables (location of contractor, debarment fraud, and length of debarment) on the debarment of a business entity at the City of Chicago.

The research question for this study was this: What predictive relationship, if any, do a contractor's location, debarment fraud, and the length of debarment on contractors listed in the debarment list have as to whether they were debarred from receiving contract awards from the City of Chicago municipal government in the State of Illinois?

The answer to the research question is expressed by the logistic regression equation. Mathematically, the equation of a multiple regression model to predict the value of outcome variable *Y* using predictor variables X_1 to X_3 is stated below:

$\Upsilon = \beta_0 + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + e$ …………………………………………………….. (1)

Where, ϒ = Predicted probability of the main event, debarment of business entity (Firm)

1-ϒ = Predicted probability of other event, business entity (Individual)

χ_1 = Location of contractor (Chicago)

χ_2 = Debarment fraud (Procurement Fraud)

χ_3 = Length of debarment (Length)

β_0 = Intercept (Constant)

β_1 = Regression coefficient of χ_1

β_2 = Regression coefficient of χ_2

β_3 = Regression coefficient of χ_3

e = Residual term

The logit transformation gives the following equation:

Logit (ϒ) = ln (Odds) = $ln\left(\frac{P(Y)}{1-P(Y)}\right) = \beta_0 + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3$ …..………………… (2)

P = probability of the event occurring, e.g. a Firm getting debarred

Odds Prediction Equation =

$Exp^{(\beta_0+\beta_1\chi_1+\beta_2\chi_2+\beta_3\chi_3)}$ ………………………….………..……………………….(3)

Covert odds to probabilities as given below

Probability function = $P = Exp^{(\beta_0+\beta_1\chi_1+\beta_2\chi_2+\beta_3\chi_3)} / [1 + Exp^{(\beta_0+\beta_1\chi_1+\beta_2\chi_2+\beta_3\chi_3)}]$ ……..(4)

Or written as $P = \left(\frac{\text{odds}}{1+\text{odds}}\right)$ ..... (5)

$0 < p < 1$

From (1) above, the final logistic regression equation is given below:

Logit (Firm) = ln (odds) = -2.256 + 0.345$\chi_{Location}$ + 1.926χ_{Fraud} + 0.011χ_{Length}

Assuming location of contractor = Chicago (coded as 1), debarment fraud = procurement fraud (coded as 1), and length of debarment = 1 year, the odds and probability for procurement fraud to trigger debarment of a firm are calculated below:

a. Recall procurement fraud, coded as "1" to predict business entity (firm)

Ln (Odds) = -2.256 + (0.345*1) + (1.926*1) + (0.011*1) + e = 0.026

Odds (Firm) = Exp (0.026) = **1.03**

Probability (Firm) = $P = \left(\frac{odds}{1+odds}\right)$ = $\left(\frac{1.03}{1+1.03}\right)$ = 0.507 = **50.74%**

b. Recall nonprocurement fraud, coded as "0" to predict business entity (firm)

Ln (Odds) = -2.256 + (0.345*1) + (1.926*0) + (0.011*1) + 0 + e = -1.9

Odds (Firm) = Exp (-1.9) = **0.1496**

Probability (Firm) = [0.1496/ (1 + 0.1496] = 0.13 = **13%**

$Odds\ Ratio_{(Procurement\ vs.\ Nonprocurement)}$ = 1.03/0.1496 = **6.86**

The odds and probability for procurement fraud to trigger debarment of an individual contractor are calculated below:

c. Calculating for procurement fraud, coded as "1" to predict business entity (individual)

Logit (Individual) = 1- Logit (Firm) = (1 - 0.026) = 0.974

Odds (Individual) = Exp (0.974) = 2.649

Probability (Individual) = [(2.649/ (1+2.649)] = 0.726 = **72.60%**

d. Calculating for nonprocurement fraud, coded as "0" to predict business entity (individual)

Logit (Individual) = 1- Logit (Firm) = (1 + 1.9) = 2.9

Odds (Individual) = Exp (2.9) = 18.74

Probability (Individual) = (18.74/ (1 + 18.74) = 0.9493 = **94.93%**

A binomial logistic regression analysis was performed to predict the effect of location of contractor, debarment fraud, and length of debarment on the business entities debarred from doing business with the City of Chicago. SPSS was used to perform data from 138 cases included in this analysis. The data analyzed covered debarment actions at the City of Chicago for twelve Fiscal Years from FY 08 to FY19. In the outcome variable, busines entity category, coding for the variable Firm =1 and Individual = 0. The predictors variables were also coded in the model: for the location of contractor category, coding for the variable Chicago =1 and Other city = 0, and for debarment fraud category, the variable procurement fraud = 1 and nonprocurement = 0. Box-Tidwell Test was used with a Bonferroni correction to show a statistical significance at $p < .01$ (Tabachnick & Fidell, 2014). This test assessed that the length of debarment was linearly related to the logit of the dependent variable. The Hosmer and Lemeshow goodness of fit test showed an evidence of model fit (Hosmer, Lemeshow, 2000). The result of the binary logistic regression model analysis showed strong statistical significance, $\chi 2(3) = 11.408$, $p < .001$. Since the test for significance is at $p < .05$, debarment fraud was the only predictor

variable that was statistically significant (see Table 16). The Wald ratio for the other predictor variables - location of contractor ($\chi 2(3) = 0.805$, $p < 0.370$) and length of debarment ($\chi 2(3) = 0.023$, $p < 0.879$) did not add significantly to the model. The logistic regression model analysis explained approximately 15.9% (Nagelkerke R^2) of the variation in the debarred business entities variable and correctly classified 62.3% of cases. Sensitivity was 60.71%, specificity was 63.41%, the positive predictive value was 53.13%, and the negative predictive value was 70.27%. A procurement fraud had 6.86 times higher odds to get firms debarred compared with a nonprocurement fraud.

I established in this study that only debarment fraud contributed significantly to the model in Table 17. To determine the debarment fraud effects on the model, I ran a separate logistic regression specifically for all the fraud types in the variable of dichotomous debarment fraud and controlled for location of contractor and length of debarment. The fraud type variables are categorical, with six different frauds. The dummy code created in SPSS are: Phony company = 1, Forgery = 2, Set-aside = 3, Invoicing = 4, Nonprocurement = 5, while I selected Contract Fraud as the reference category. Table 18 is the logistic regression for fraud types. Contract fraud was chosen as the reference category because it is the type of fraud that recorded the highest debarment in the sample. The model showed that phony company, forgery, and nonprocurement frauds are significant. The fraud of using a phony company to do business with the City is 21.3 times more likely to trigger the debarment of a firm when compared to contract fraud.

Table 17

Logistic Regression Predicting Likelihood of Business Entity debarred based on Location of Contractor, Debarment Fraud and Length of Debarment.

Variable	B	S.E.	Wald	*df*	*p*	Odds ratio	95% C.I. for odds ratio Lower	Upper
Location(1)	.345	.385	.805	1	.370	1.412	.664	3.002
Fraud(1)	1.926	.570	11.408	1	.001	6.860	2.244	20.974
Length	.011	.073	.023	1	.879	1.011	.876	1.167
Constant	-2.256	.892	6.392	1	.011	.105		

Note. Predicted probability is of Business Entity for Firm. Statistical significance threshold = $p < .05$

Table 18

Logistic Regression for Fraud Types

Variable	B	S.E.	Wald	*df*	*p*	Odds ratio	95% C.I. for Odds ratio Lower	Upper
Location (1)	.284	.432	.432	1	.511	1.328	.570	3.095
Debarment Fraud			22.507	5	.000			
Phony Company	3.058	1.122	7.426	1	.006	21.288	2.360	192.032
Forgery	-2.213	1.103	4.026	1	.045	.109	.013	.950
Set-aside	.154	.502	.094	1	.760	1.166	.436	3.116
Invoicing	.162	1.083	.022	1	.881	1.176	.141	9.819
Nonprocurement	-1.823	.628	8.429	1	.004	.162	.047	.553
Length	-.099	.084	1.387	1	.239	.905	.767	1.068
Constant	.505	.821	.378	1	.539	1.657		

Note. Types of Fraud are compared to Contract fraud (reference category).
Dependent variable = Business Entity (Firm).
Statistical significance threshold = $p < .05$

Summary

In Chapter 4, I showed that by using binomial logistic regression analysis to analyze the data in the debarment list of the City of Chicago, the predictor variables of location of contractor, debarment fraud and length of debarment proved to be significantly effective predicting the likelihood of a business entity that may be debarred by the City. Table 11 confirmed there was a statistically significant association in the predictor variables used in the study, $\chi 2(3) = 17.263$, $p < .001$. I rejected the null hypothesis but accepted the research hypothesis. The debarment fraud was the only predictor variable that contributed to the significance in the model. I ran a separate logistic regression analysis to examine the effect of different debarment fraud types on business entity. The model showed that phony company, forgery and nonprocurement frauds are significant. The fraud of using a phony company to do business with the City is 21.3 times more likely to trigger the debarment of a firm when compared to contract fraud. In Chapter 5, the final chapter of this study, I discussed the interpretation of the findings, implications, and limitations of the study, and offered policy recommendations that invite a paradigm for social change.

Chapter 5: Discussion, Conclusions, and Recommendation

This study was set out to examine whether the data in the City of Chicago's Debarment List can determine the statistical probability of business entities (firms or individuals) that may be debarred from government contracting in the City. This study was a nonexperimental quantitative method of secondary data analysis of the Debarment List of the City of Chicago. Based on the principles of deterrence theory, this study was a scholarly attempt to produce predictive analytics which public agencies may use to deter government contractors from committing frauds in public procurement. The result of the findings showed that there was a statistically significant association in the predictor variables used in the study.

Interpretation of the Findings

A binomial logistic regression analysis was performed to examine the effect of location of contractor, debarment fraud, and length of debarment on the likelihood of the business entity that may be debarred from receiving contract awards from the City of Chicago. The logistic regression equation showed the following probabilities:

- A procurement fraud had a 50.74% probability to trigger debarment for a firm.
- A procurement fraud was 1.03 times more likely to cause debarment for a firm.
- A procurement fraud had a 72.60% probability to trigger debarment for an individual contractor.
- A nonprocurement fraud has a probability of 13% to trigger debarment for a firm.

- A nonprocurement fraud is 0.15 times more likely to cause debarment for a firm.
- A nonprocurement fraud has a probability of 94.93% to trigger debarment of an individual.
- The odds of having a firm debarred are 6.86 times higher for procurement fraud that they are for nonprocurement fraud.
- The fraud of using a phony company to do business with the City is 21.3 times more likely to trigger the debarment of a firm when compared to contract fraud.

The binomial logistic regression model result in this study showed statistical significance, $\chi 2(3) = 17.263$, $p < .001$. As all other independent variables remain constant (see Table 17), the coefficients show the change in the log odds that occur for a one-unit change in an independent variable (Laerd Statistics, 2017). In the case of debarment fraud, the change in log odds for procurement fraud is 1.926. This value is the increase in log odds (as B is positive) for debarment fraud related to procurement. Among the three predictor variables, location ($p = 0.370$) and length ($p = 0.879$) did not add significantly to the model. Only the debarment fraud was statistically significant at $p < .001$ (see Table 17). This result means that when controlled for location of contractor and the length of debarment, procurement fraud has a 50.7% probability of triggering debarment for a firm relative to nonprocurement fraud. Also, procurement fraud has a 72.60% probability of triggering debarment for an individual contractor relative to nonprocurement fraud. The interpretation of this result is that a business entity registered to do business with the City

as an individual was debarred for procurement fraud more than firms. The odds ratio, which SPSS calculated as the Exp(B) value, is 6.86 for procurement fraud (coded as "1" under the debarment fraud category). Taking the exponent of the log odds, indicated in the output as Exp(B), gives the odds ratio, which shows that a one unit increase in a procurement fraud case increases the odds of getting a firm debarred from City contracts by a multiplicative factor of 6.86 compared to a nonprocurement case. In other words, the odds suggest that if a contractor is chosen at random from the sample, a procurement fraud is 6.86 more likely than a nonprocurement fraud to cause a firm to be debarred. The confidence interval suggests that the actual difference in odds of firm debarment for procurement fraud compared with nonprocurement fraud could be as low as 2.25 or as high as 20.95. In Table 18, the fraud of using a phony company to do business with the City is 21.3 times more likely to trigger debarment of a firm when compared to contract fraud. These statistical odds are noteworthy because the City debarred more business entities for contract fraud (n = 40) than other frauds in the sample under review. This result means that a business entity that uses a phony company to do business with the City is certainly a huge risk to its procurement interests. This model result confirms the City's policy, which debars a business entity that registered with the City as a firm for a lifetime if it was determined that the firm has egregiously violated procurement rules (City of Chicago, 2020). A lifetime sanction means that the City will not allow a company debarred for lifetime to do business with the City in any circumstances. Overall, the results in this study are consistent with the findings of many scholars that government agencies continue to face the risks of contracting with fraudulent or criminal contractors

(Auriol & Søreide, 2017; McCue et al., 2015; Rendon & Rendon, 2015; Williams-Elegbe, 2019). It was also confirmed by government agencies and multinational organizations (GAO, 2014; ISCD, 2018; OECD, 2016, The World Bank, 2019).

Research Question and Deterrence Theory and Conceptual Framework

The research question asked for the probability of a business entity that may be debarred from receiving contract awards from the City of Chicago based on the effect of contractor's location, debarment fraud and the length of debarment. In Chapter 2, I postulated that, in government contracting, the element of debarment deterrence is the probability of catching a contractor for procurement violations (celerity), probability of debarment (certainty), and the probability of getting listed in the debarment list (severity). In accordance with deterrence theory, increasing the probability of being caught increases the certainty that a contractor will be debarred. It suffices to say that by keeping a debarment list of those debarred, a government can prevent or reduce the rate of procurement violations in its jurisdiction. The certainty of being debarred deters a rational contractor from violating procurement regulations than celerity (Auriol & Søreide, 2017). Severity in deterrence theory is the strength of a sanction that correlates with the probability of a high crime cost, which is akin to the debarment length in the debarment system. Studies on the severity of punishment from legal sanction show that short to moderate punishment is likely to produce more effective deterrence than longer punishment (Cerrone et al., 2018; Tanaka & Hayashi, 2016; Tomlinson, 2016).

The evolution of my conceptual framework is displayed in Figure 8. The emergent probabilities have been added to establish how deterrence theory underpinning

debarment deterrence may impact contractor willingness to receive contracts from government agencies. The logistic regression model predicts the odds and probability that a case of a given debarment fraud will trigger a firm's debarment in government contracting. Since debarment fraud was the only significant variable in the model and procurement fraud was the event of occurrence in the model, the results showed that procurement fraud has the odds of 1.03 or probability of 50.74% to cause the City to debar a business entity registered as a firm from doing procurement business with the City. Also, procurement fraud has the odds of 2.649 or probability of 72.60% to likely cause the City to debar a business entity registered as an individual contractor from doing procurement business with the City.

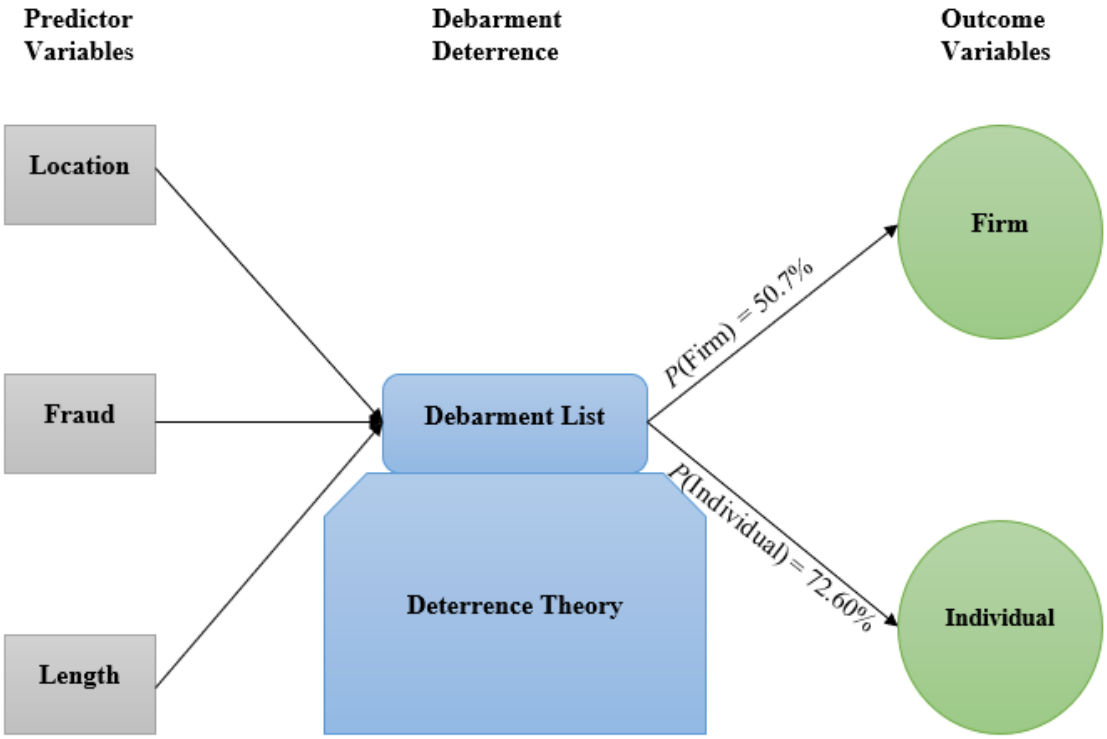

Figure 8. The debarment deterrence model with probability values.

These probabilities suggest that procurement fraud has greater chances of triggering debarment of an individual contractor than a firm relative to nonprocurement fraud. The conceptual model highlights the probabilities of how procurement fraud can trigger the debarment of firms and individual contractors differently but equitably. It also gives an insight into how debarment deterrence of procurement fraud shows better impact on firms than individual contractors when compared with nonprocurement fraud. The probability of legal sanction deter fraud greater than the severity of legal sanction (Mann, Garcia-Rada, Hornuf, & Tafurt, 2016). Procurement fraud is 6.86 times more likely to cause a firm to be debarred than an individual contractor relative to nonprocurement fraud. Therefore, this study confirmed that deterrence theory can be used to show that the probability of reducing a procurement fraud in public procurement can be achieved through debarment sanction.

Limitations of the Study

I selected the debarment list of the City of Chicago for analysis because the City's list has all the data relevant for this study. The limitation to the generalizability of this study is that a government agency that does not have the type of secondary data I used in this study may not adapt the design of this study to generalize from the study sample to a larger population. It is important to generalize research outcomes from a dataset to real-world practice settings (Polit & Beck, 2017). Another limitation in this study was that the algorithms I built for the dataset that I used in this study were populated by my hand due to lack of automation. Although this was a major practical constraint during the study, I

applied a robust study design that did not allow for sampling deficiencies or data quality problems.

Recommendations

The results of this study provided support for the relationship between location of contractor, debarment fraud, length of debarment and business entity. A practical recommendation for practice is that public agencies will need to keep detailed data of all the variables used in this study to tap into the opportunity to statistically predict certain contractors that might be involved in different types of procurement fraud. A business entity registered as an individual faced more debarments for committing procurement fraud relative to a firm. One recommendation is for the Department of Procurement Services at the City of Chicago to develop an intelligent policy to scrutinize the responsiveness and responsibility of individual contractors. The City and other public agencies need predictive capabilities that may foster the clarity, accountability, and integrity of its debarment system, to act as the first defense barrier in the quest to prevent or deter procurement fraud. More academic studies with bigger sample size are worthwhile to evaluate the innovative idea of utilizing a debarment list to produce the most statistically probable outcomes. Also, there is a need to address the issues regarding the application of cognitive technology on the debarment list to produce statistical predictions. I populated the dataset used in this study by hand due to lack of automation. However, artificial intelligence (AI) can be used to perform these time-consuming and laborious tasks at a scale and cost that human beings could not possibly do. Scholars reported that AI application in procurement will be the next wave of cognitive technology

that will impact public procurement practices very soon (Muchhala, 2018; Schubmehl et al., 2018; Zagorin, 2017). Hence, further academic research is imperative to discover how to apply AI based on data mining, data modeling and machine learning to automate the debarment list dataset. The ensued predictive analytics should open the need for government agencies to apply digital transformations in debarment. Otherwise, government agencies may continue to operate with an inability to gather meaningful data from a debarment list to perform intelligent data analysis.

Implications

In this study, I framed public debarment fraud as an endemic social problem, which may not allow the society to function at an optimal level. Predictive applications of the debarment list imply that procurement in the public sector needs social change for fraud prevention, public advocacy, and management of public funds. First, this study's predictive analytics may strengthen the use of debarment as statutory enforcement to prevent or curb public procurement frauds. Second, the results of predictive analytics in this study may empower public advocacy to illuminate the urgency for contractors and government agencies to mitigate the risks of procurement fraud and push to direct taxpayers' money to what it is meant to fund: procurement of goods and services for the common good of the people. Third, the empirical representation of the relationship between all the predictor variables and outcome variable can be stated as follows: A business entity debarred in a government agency is a function of the location of the contractor, debarment fraud committed and the length of debarment sanction on the

contractor. Theoretically, a predictive mathematical model for this function can be represented as:

$$\textbf{Logit (Firm)} = -2.256 + 0.345\chi_{Location} + 1.926\chi_{Fraud} + 0.011\chi_{Length}$$

A summary implication of this study was supported by Vollmer and Machholz (2017). They conducted a survey of Chief Procurement Officers (CPOs) around the globe and reported that about 83% of procurement leaders who participated in the survey think AI will revolutionize public procurement practices in no distant future. Therefore, Chief Procurement Officers and policymakers may utilize the information from this study to reimagine public procurement with better debarment practices, purchasing decisions, and prudent public funds management.

Conclusion

I developed the conceptual framework, the DDM, for this study as well as coined the term "debarment deterrence" for this research. This study has contributed to the body of knowledge by using deterrence theory to explain debarment sanctions. It has facilitated the discussions on the conceptual framework underpinning the predictor and outcome variables examined in this study. To the best of my knowledge, this research is the first study to examine a government debarment list's capability to produce statistical predictions. It has closed the literature gap by presenting a new knowledge about the critical link between a debarment list's predictive relevance and the effectiveness of debarment deterrence on government contractors. The burden of procurement fraud in public procurement is still and important public policy issue across all the three levels of government (Williams-Elegbe, 2016). However, based on the deterrence theory, the study

showed that the ability to deter public procurement fraud might be subject to the predictive capability of relevant fraud data in a debarment list. Since a debarment action is not a punishment but a deterrence-oriented policy (Levy & Wagner, 2018; The World Bank, 2016), this study recommends the pathway for government organizations to consider data-driven practical deterrent solutions that may effectively prevent procurement fraud, waste and abuse.

An adverse effect of fraudulent procurement practices is evident in the debarment sanctions on many unscrupulous contractors. The association of location of contractor, debarment fraud, and length of debarment can predict business entity that may be debarred from the City of Chicago and provide support for the research hypothesis. The logistic regression equation for this study predicts that the odds of getting a firm to be debarred are 6.86 times higher for procurement frauds than they are for nonprocurement frauds. Specifically, the model showed the following results: 50.7% procurement fraud will trigger debarment for a firm, 72.60% Procurement fraud will trigger debarment for an individual contractor, 13% of nonprocurement fraud will trigger debarment for a firm and 94.93% of nonprocurement fraud will trigger debarment of an individual contractor. Furthermore, a contractor using a phony company to do business with the City is 21.3 times more likely to cause debarment of a firm relative to contract fraud. The statistical predictions should open the need to apply AI in debarment practices. ServiceNow (n. d.) found that 77% of government procurement managers expect AI deployment would reduce workload of complex public procurement tasks. As shown in this study, the use of the predictive applications of debarment list by government organizations should

predicate on the supposition that government contractors may not engage in best business practices to do business with the government responsibly. Predictive applications of debarment list can create the appropriate balance of risk between the government contractors and the agencies to mitigate fraud and avoid unnecessary expenditures of public funds. This statistical transformation may allow government agencies to plan for the most statistically probable outcomes with confidence scores based on information gathered from historical debarment data.

Finally, the City of Chicago and other public agencies may use the information in this research as a reform guidepost that may elevate the debarment list's predictive capabilities in their debarment programs.

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Appendix: Debarred City of Chicago Firms and Individuals

ENTITY/INDIVIDUAL	DEBARMENT DATE	LENGTH OF DEBARMENT	REASON
James M. Duff 135 Post Road Burr Ridge, IL 60527	3/21/2008	Lifetime	Criminal convictions on various counts including fraud related to the MWBE program.
William E. Stratton 4923 S. Princeton Ave Chicago, IL 60609	3/21/2008	Lifetime	Criminal convictions on various counts including fraud related to the MWBE program.
Terrence Dolan 325 N. County Line Road Hinsdale, IL 60521	3/21/2008	Lifetime	Criminal convictions on various counts including fraud related to the MWBE program.
Windy City Labor Services Inc.	3/21/2008	Permanent	Company used by James M. Duff to commit MWBE program fraud.
Remedial Environmental Manpower, Inc.	3/21/2008	Permanent	Company used by James M. Duff to commit MWBE program fraud.
Windy City Maintenance, Inc.	3/21/2008	Permanent	Company used by James M. Duff to commit MWBE program fraud.
Curtis Storage & Trucking Co.	3/21/2008	Permanent	Company used by James M. Duff to commit MWBE program fraud.
American Management and Consulting Services Inc.	3/21/2008	Permanent	Company used by James M. Duff to commit MWBE program fraud.
Elliott Trucking, Inc.	12/17/2008	Permanent	Company used by Martin McDonagh to commit fraud.
Martin McDonagh	12/17/2008	Lifetime	Criminal fraud conviction.
Garfield Trucking, Inc.	12/17/2008	Permanent	Company used by Charles Romano and Richard Rylewicz to commit fraud.
Charles Romano 6952 North Oriole Ave. Chicago, IL 60631	12/17/2008	Lifetime	Criminal fraud conviction.
Richard Rylewicz 6732 West Cermak Rd. Berwyn, IL 60402	12/17/2008	Lifetime	Criminal fraud conviction.

R&V Trucking, LLC	12/17/2008	Permanent	Company used by Robert Mangiamele to commit fraud.
Robert Mangiamele 532 Lois Ct. Mount Prospect, IL 60056	12/17/2008	Lifetime	Criminal fraud conviction.
Sarch Hauling, Ltd.	12/17/2008	Permanent	Company used by Salvador Alvarez to commit fraud.
Salvador Alvarez 6951 S. Bell Ave. Chicago, IL 60636	12/17/2008	Lifetime	Criminal fraud conviction.
Patricia Trucking	12/17/2008	Permanent	Company used by Patricia Fasula to commit MWBE program fraud.
Patricia Fasula 3826 S. Lowe Ave. Chicago, IL 60609	12/17/2008	Lifetime	Falsified MWBE certification documents.
Pitts Transportation, Inc.	12/17/2008	Permanent	Company used by Richard Pitts to commit fraud.
Richard Pitts 2518 East Creekwood Ct. Crete, IL 60417	12/17/2008	Lifetime	Falsified documents in seeking to obtain City contract.
GNA Trucking, Inc.	2/17/2009	Permanent	Company used by John Canatello to commit fraud.
John Cannatello 8201 W. 118th St. Palos Park, IL 60464	3/19/2009	Lifetime	Criminal fraud conviction.
American Tank, Inc.	2/24/2009	Permanent	Company used by Michael Leyden and Timothy Schrader to commit fraud.
Michael Leyden 6604 N. Sioux Ave. Chicago, IL 60646	6/25/2009	Lifetime	Committed fraud.
Timothy Shrader 6604 N. Sioux Ave. Chicago, IL 60646	6/25/2009	Lifetime	Criminal fraud conviction.
Ignoffo Trucking, Inc.	2/24/2009	Permanent	Company used by Joseph Ignoffo to commit fraud.
Joseph Ignoffo 25390 Columbia Bay Dr. Lake Villa, IL 60046	6/25/2009	Lifetime	Criminal fraud conviction.

LR&C Truck Line, Inc.	2/24/2009	Permanent	Company used by Leroy Peters to commit fraud.
Commelie Peters **9230 South Racine** **Chicago, IL 60620**	6/25/2009	Lifetime	Perjury conviction.
Leroy Peters **1232 E. Bemes Rd.** **Crete, IL 60417**	6/25/2009	Lifetime	Criminal fraud conviction.
Victory Transport, Inc.	2/24/2009	Permanent	Company used by Terrance Williams to commit forgery.
Terrance Williams **10436 South Maryland** **Chicago, IL 60628**	6/25/2009	Lifetime	Committed forgery.
BCI Commercial Roofing, Inc.	3/6/2009	Permanent	Company used by Christopher G. Kelly to commit fraud.
CGK Consulting, Inc.	3/6/2009	Permanent	Company used by Christopher G. Kelly to commit fraud.
Cayla Trucking, Inc.	3/11/2009	Permanent	Company used by Debra Coveliers and Richard Coveliers to commit fraud.
Richard Coveliers **5835 West Higgins** **Chicago, IL 60630**	3/19/2009	Lifetime	Criminal fraud conviction.
Debra Coveliers **5835 West Higgins** **Chicago, IL 60630**	3/19/2009	Lifetime	Criminal fraud conviction.
FRC Trucking, Inc.	3/11/2009	Permanent	Company used by Frank Canatello to commit fraud.
Frank Cannatello **2947 South Halsted St.** **Chicago, IL 60630**	3/19/2009	Lifetime	Criminal fraud conviction.
Lightner Services, Inc.	3/11/2009	Permanent	Company used by Vincent Hinton to commit MWBE program fraud.
Vincent Hinton **4707 West Erie** **Chicago, IL 60644**	6/25/2009	Lifetime	Submitted fraudulant MBE certification documents.
A. Affetto Trucking, Inc.	3/19/2009	Permanent	Company used by Anthony Affetto to commit fraud.
Anthony Affetto **2143 N. Narragansett** **Chicago, IL 60639**	6/25/2009	Lifetime	Criminal fraud conviction.

John J. Leahy 26107 Oakcrest Ln. Plainfield, IL 60585	3/19/2009	Lifetime	Criminal fraud conviction.
Edward Wisniewski 7118 W. Main St. Niles, IL 60714	6/25/2009	Lifetime	Criminal fraud conviction.
James H. Levin 5440 Touhy Ave. Skokie, IL 60077	3/19/2009	Lifetime	Criminal fraud conviction.
Get Plowed, Inc.	10/28/2009	Permanent	Company used by Michael Jones to commit fraud.
Michael Jones 5701 S. Sayre Ave. Chicago, IL 60638	6/25/2009	Lifetime	Criminal fraud conviction.
James Picardi 2726 Moraine Valley Rd. Wauconda, IL 60084	6/25/2009	Lifetime	Criminal fraud conviction.
Urban Services of America	6/4/2010	Permanent	Criminal fraud conviction.
Douglas E. Ritter	6/4/2010	Lifetime	Criminal fraud conviction.
Steven Fenzl 33 Marisol Newport Coast, CA 92657	9/29/2010	Lifetime	Criminal fraud conviction.
Milton A. Curry 6014 S. Racine Avenue Chicago, IL 60636	10/25/2010	Lifetime	Financial irregularities; refused to cooperate with IGO investigation.
Fannie Weinshenker a/k/a Fannie Gasparik 5924 West 107th Place Chicago Ridge, IL 60415	11/23/2010	Lifetime	Orchestrated scheme to defraud City.
KAR-DON, Inc. d/b/a Arrow Lumber Company 5820 S. Ashland Avenue Chicago, IL 60636	12/1/2010	Permanent	Submitted fraudulent invoices to the City and delivered materials in amounts smaller than the invoiced amounts.
Donald L. Beal 5820 S. Ashland Avenue Chicago, IL 60636	12/15/2010	Lifetime	Submitted fraudulent invoices to the City and delivered materials in amounts smaller than the invoiced amounts.

Stephan Smith **6413 Foggy Hills Way** **Clifton, VA 20124**	12/9/2010	Lifetime	Oversaw approval of additional work outside of the scope of contract and without City authorization for performance of extra work.
Divine Enterprises, Inc. a/k/a Divine Equipment Leasing, Inc. **25W705 Harrison** **Wheaton, IL 60187**	12/9/2010	Permanent	Deceptive documentation related to WBE certification.
Annette Redmond **25W705 Harrison** **Wheaton, IL 60187**	12/9/2010	Lifetime	Deceptive documentation related to WBE certification.
Nancy Jacob **25W705 Harrison** **Wheaton, IL 60187**	12/9/2010	Lifetime	Deceptive documentation related to WBE certification.
Aurora Venegas **4500 S. Kolin Ave.** **Chicago, IL 60632**	12/13/2010	Lifetime	Guilty Plea on criminal indictment for fraudulently claiming to be a legitimate M/WBE business and acting as a pass-through for other companies.
Azteca Supply Co. **4500 S. Kolin Ave.** **Chicago, IL 60632**	12/13/2010	Permanent	Fraudulently claimed to be a legitimate M/WBE business and acted as a pass-through for other companies.
Polibio Cabrera **1932 N. Tripp Ave., #1** **Chicago, IL 60639**	12/16/2010	Lifetime	Made false statements to Inspector General's Office Investigators in connection with investigation.
Cabrera Construction **1932 N. Tripp Ave., #1** **Chicago, IL 60639**	12/16/2010	Permanent	Performed construction work as unlicensed contractor; made false statements to Inspector General's Office Investigators.
Isaias Gonzalez **2622 West Cermak** **Chicago, IL 60608**	12/16/2010	Lifetime	Falsified invoices submitted to the City for payment; Fabricated false documentation to mislead auditors from Compliance. Directed a witness to lie to IGO investigators.
Centro Familiar La Gran Esperanza f/k/a Great Hope Family Center **2622 West Cermak** **Chicago, IL 60608**	12/16/2010	Permanent	Falsified a reimbursement voucher and submitted it to the City for payment; Fabricated false documentation to mislead auditors from Compliance.
Carl Easter **3935 West Fullerton Ave.** **Chicago, IL 60647**	1/5/2011	Lifetime	M/WBE program fraud.

Logan Square Pest Control 3935 West Fullerton Ave. Chicago, IL 60647	1/5/2011	Permanent	M/WBE program fraud.
Rochelle Knox 2733 Lake Park Drive Lynwood, IL 60411	1/20/2011	Lifetime	Submitted false documents in connection with City contracts; Submitted fraudulent reimbursement claims to the City.
Changing Patterns for Families, Inc. 5912 S. State Street Chicago, IL 60621	1/20/2011	Permanent	Submitted false documents in connection with City contracts; Submitted fraudulent reimbursement claims to the City.
Kristi Contreras	2/7/2011	Lifetime	Owner of Cornerstone Construction Services, Inc. Engaged in MWBE Program Fraud.
Cornerstone Construction Services, Inc. 330 S. Naperville Road, Suite 401 Wheaton, Illinois 60187	2/7/2011	Permanent	Engaged in MWBE Program Fraud.
Danton Fielder 139 West 107th Street Chicago, IL 60628	3/31/2011	Lifetime	Engaged in MWBE Program Fraud.
D & S Midwest Construction 139 West 107th Street Chicago, IL 60628	3/31/2011	Permanent	Engaged in MWBE Program Fraud.
Joseph Depa	4/20/2011	Lifetime	Approved additional work outside of the scope of contract and without authorization from the City.
Nat L. Hyman 727 N. Meadow St. Allentown, PA 18102	5/18/2011	Lifetime	Failed to cooperate with IGO investigation.
Doris Moran LaSilva 1851 W. Grand Ave. Chicago, IL 60622	5/24/2011	Lifetime	Misrepresentations regarding Ms. LaSilva's role and ownership interest in Lupita Contractors, Inc.
Lupita Contractors, Inc. 1851 W. Grand Ave. Chicago, IL 60622	5/24/2011	Permanent	Misrepresentations regarding Ms. LaSilva's role and ownership interest in Lupita Contractors, Inc.
Anna Easter 1316 N. Pulaski Road Chicago, IL 60651	6/27/2011	Lifetime	MWBE program fraud.

N & L Pest Control 1316 N. Pulaski Road Chicago, IL 60651	6/27/2011	Permanent	MWBE program fraud.
Corren Evans 3335 S. Cottage Grove Chicago, IL 60653	7/13/2011	Lifetime	Criminal indictment for theft from City delegate agency.
Janice Nattee 5003 N. Ashland Unit 1 E Chicago, IL 60640	7/29/2011	Lifetime	Submitted false documents to the City.
The Stuff Toy Childrens Museum 5003 N. Ashland Unit 1 E Chicago, IL 60640	7/29/2011	Permanent	Submitted false documents to the City.
Barry L. Fischer, MD 1530 N. Ashland River Forest, IL 60305	8/12/2011	Lifetime	By agreement.
Finis Collier, Jr. 3309 W. Van Buren Chicago, IL 60624	8/29/2011	Lifetime	Fraudulently claimed to operate a legitimate M/WBE business and acted as a pass-through for another company.
FCJ Real Estate Development Company, Inc. 3309 W. Van Buren Chicago, IL 60624	8/29/2011	Permanent	Fraudulently claimed to be a legitimate M/WBE business and acted as a pass-through for another company.
Earlene Heyden 2314 Windsor Lane Country Club Hills, IL 60478	9/28/2011	Lifetime	Submitted false documents to the City.
Yong S. Yang 632 Executive Drive Willowbrook, IL 60527	2/9/2012	Lifetime	Workers compensation insurance fraud relating to City contracts.
Nationwide Janitorial Corporation 632 Executive Drive Willowbrook, IL 60527	2/9/2012	Permanent	Workers compensation insurance fraud relating to City contracts.
Jimmie Acevedo 419 E. Clark Street Crown Point, IN 46307	5/16/2012	Lifetime	M/WBE Program fraud.
Anthony McMahon 301 N. Prospect Park Ridge, IL 60068	8/20/2012	Lifetime	False Statements. M/WBE program fraud.

John McMahon 6090 N. Kirkwood Chicago, IL 60646	8/20/2012	Lifetime	False Statements. M/WBE program fraud.
Kathleen McMahon 301 N. Prospect Park Ridge, IL 60068	8/20/2012	Lifetime	False Statements. M/WBE program fraud.
Nancy McMahon 6090 N. Kirkwood Chicago, IL 60646	8/20/2012	Lifetime	False Statements. M/WBE program fraud.
Windy City Electric Company 7225 West Touhy Chicago, IL 60631	8/20/2012	Permanent	False Statements. M/WBE program fraud.
James J. McHale 5400 N. Northwest Highway Chicago, IL 60630	9/11/2012	Lifetime	Imputation of False Statements and Documents.
Tom Kamykowski 2652 N. Mango Ave. Chicago, IL 60639	9/11/2012	Lifetime	False Statements and Documents.
Thomas Masen 2755 Ginger Woods Drive Aurora, IL 60502	12/21/2010	Lifetime	M/WBE program fraud.
Dr. George E. Smith 11070 S. Western Ave. Chicago, IL 60643	10/1/2014	Lifetime	Debarment by another government agency.
MPI, Inc. d/b/a Management Planning Institute, Inc. 11070 S. Western Ave. Chicago, IL 60643	10/1/2014	Permanent	Debarment by another government agency.
Diversified Behavioral Services, Inc. 11070 S. Western Ave. Chicago, IL 60643	10/1/2014	Permanent	Debarment by another government agency.
Institute for Positive Child and Family Development, Inc. 11070 S. Western Ave. Chicago, IL 60643	10/1/2014	Permanent	Debarment by another government agency.

Ed's Investment Management--Real Estate, Inc. 11070 S. Western Ave. Chicago, IL 60643	10/1/2014	Permanent	Debarment by another government agency.
DBCC Organization 11070 S. Western Ave. Chicago, IL 60643	10/1/2014	Permanent	Debarment by another government agency.
Brian Mullins 18462 Dixie Highway Homewood, IL 60430	12/3/2014	Lifetime	False Statements and Documents.
Josip Beslic 3032 S. Princeton Ave. Chicago, IL 60616	5/20/2015	Lifetime	False Statements and Documents.
Anthony Blum 8023 Nature Creek Court Frankfort, IL 60423	10/7/2015	Lifetime	M/WBE program fraud.
Loretta Dicke	10/20/2016	Lifetime	M/WBE Program fraud.
Leticia Davis	10/24/2017	24 months	False Statement/Representation
Norvetta Landon 5621 S. Ashland Ave. Chicago, IL 60636	4/2/2018	Lifetime	Failure to cooperate with IG
Indelible Impressions Construction, Inc. 5621 S. Ashland Ave. Chicago, IL 60636	4/2/2018	Lifetime	Failure to cooperate with IG
South Chicago Chamber of Commerce 8948 S. Commercial Ave. Chicago, IL 60617	2/1/2019	Lifetime	Committed Fraud
Daniel Lira 8948 S. Commercial Ave. Chicago, IL 60617	2/1/2019	Lifetime	Committed Fraud
Branko Vardijan 221 North Washtenaw Ave. Chicago, IL 60612	5/7/2020	Lifetime	Attempted to perpetrate fraud on the City.
Ravenswood Disposal Service, Inc. 221 North Washtenaw Ave. Chicago, IL 60612	5/7/2020	Lifetime	Attempted to perpetrate fraud on the City.

ENTITY/INDIVIDUAL	DATE OF INTERIM RESTRICTIONS	REASON
ML Group, LLC 1507 E. 53rd Street Unit 807 Chicago, IL 60615	12/18/2012	The Illinois Department of Transportation issued a Notice of Suspension and Interim Suspension of ML Group.

LIST OF FIRMS AND INDIVIDUALS INELIGIBLE TO DO BUSINESS WITH THE CITY OF CHICAGO PURSUANT TO CHICAGO MUNICIPAL

ENTITY/INDIVIDUAL	DATE OF CONVICTION/	REASON
Central Auto Body 3548 W. North Avenue Chicago, IL 60647	5/21/1981	Owner of Central Auto Body pled guilty to, and was convicted of, charges involving fraud in relation to a City of Chicago contract.
John Szybkowski 3548 W. North Avenue Chicago, IL 60647	5/21/1981	Pleaded guilty to, and was convicted of, charges involving fraud in relation to a City of Chicago contract.
Jesse Brunt 1220 E. 75th Chicago, IL 60619	1/6/2011	Indicted on charges involving fraud in relation to a City of Chicago contract.
Brunt Brothers Transfer 1220 E. 75th Chicago, IL 60619	1/6/2011	Indicted on charges involving fraud in relation to a City of Chicago contract.
Anthony Duffy	2/24/2012	Pled guilty to charges involving fraud in relation to a City of Chicago contract.
Municipal Sewer Services	1/6/2011	Indicted on charges involving fraud in relation to a City of Chicago contract.
Manu Shah 1510 Midwest Club Oak Brook, IL 60523	7/7/2009	Pleaded guilty to, and was convicted of, charges involving fraud in relation to a City of Chicago contract.
Shah Engineering, Inc. 1510 Midwest Club Oak Brook, IL 60523	7/7/2009	Pleaded guilty to, and was convicted of, charges involving fraud in relation to a City of Chicago contract.
Robert C. Blum 3062 W. 167th Street Markham, IL 60426	3/8/2011	Pleaded guilty to, and was convicted of, charges involving fraud in relation to a City of Chicago contract.

Castle Construction Corp. 3062 W. 167th Street Markham, IL 60426	3/8/2011	Pleaded guilty to, and was convicted of, charges involving fraud in relation to a City of Chicago contract.
U.S. Occupational Health, Inc.	3/28/2011	Pleaded guilty to, and was convicted of, charges involving fraud in relation to a City of Chicago contract.
ICS Cable, Inc.	4/29/2011	Indicted on charges involving fraud in relation to a City of Chicago contract.
Guy Potter 459 McCracken Pike Versailles, KY 40383	4/29/2011	Indicted on charges involving fraud in relation to a City of Chicago contract.
Jerone Brown 5012 W. Gladys Ave. Chicago, IL 60644	4/29/2011	Pleaded guilty to charges involving fraud in relation to a City of Chicago contract.
Matthew Giovenco 844 Fieldale Lane Grayslake, IL 60030	4/29/2011	Indicted on charges involving fraud in relation to a City of Chicago contract.
Cheronne Mayes 5012 W. Gladys Ave. Chicago, IL 60644	4/29/2011	Pleaded guilty to charges involving fraud in relation to a City of Chicago contract.
C.M.M. Cable Co., Inc. 5012 W. Gladys Ave. Chicago, IL 60644	4/29/2011	Controlling Person, Cheronne Mayes, pleaded guilty to charges involving fraud in relation to a City of Chicago contract.
Wafeek Aiyash 3756 Monarch Circle Naperville, IL 60564	8/26/2010	Pleaded guilty to, and was convicted of, charges involving bribery in relation to a City of Chicago contract.
Leon Moore 5121 N. Marmora Avenue Chicago, IL 60630	7/28/2011	Admitted to accepting money to influence his official duties while employed by the City of Chicago.
Elizabeth Perino 10924 W. 167th Street Orland Park, IL 60462	2/14/2012	Indicted on charges involving fraud in relation to a City of Chicago contract.
Perdel Contracting Corporation 10924 W. 167th Street Orland Park, IL 60462	2/14/2012	Indicted on charges involving fraud in relation to a City of Chicago contract.

Accurate Steel Installers, Inc. **14631 S. New Avenue** **Lockport, IL 60441**	2/14/2012	Indicted on charges involving fraud in relation to a City of Chicago contract.
Anthony Cappello **3539 East 118th Street** **Chicago, IL60617**	2/14/2012	Pleaded guilty to charges involving fraud in relation to a City of Chicago contract.
Diamond Coring Company, Inc. **11800 S. Ewing Ave.** **Chicago, IL 60617**	2/14/2012	Indicted on charges involving fraud in relation to a City of Chicago contract.
The Stealth Group a/k/a SGI, Inc. **11800 S. Ewing Ave.** **Chicago, IL 60617**	2/14/2012	Indicted on charges involving fraud in relation to a City of Chicago contract.
David Johnson	4/11/2008	Pleaded guilty to the offense of bribery.
John Bills **10205 S. Springfield Ave,** **Chicago, IL 60655**	5/15/2014	Indicted on charges involving fraud against the City of Chicago.
Paul Simmons **3326 Ridge Road** **Lansing, IL 60438**	5/14/2015	Charged for felony theft committed against Chicago Public Schools.
Americopy **3326 Ridge Road** **Lansing, IL 60438**	5/14/2015	Controlling person charged for felony theft committed against Chicago Public Schools.
Timothy Mason **26092 Cresta Verde** **Mission Viejo, CA 92691**	3/3/2015	Indicted on charges involving fraud against the City of Chicago.
Mariana Gerzanych **26092 Cresta Verde** **Mission Viejo, CA 92691**	3/3/2015	Indicted on charges involving fraud against the City of Chicago.
Clyde Williams 7 Chicago Avenue **Oak Park, IL 60302**	12/26/2017	Charges involving theft against the City of Chicago.
PJ's Ace Hardware, Inc. **7 Chicago Avenue** **Oak Park, IL 60302**	12/26/2017	Charges involving theft against the City of Chicago.
Kurt Koziol	1/17/2018	Charges involving theft against the City of Chicago.

Koziol Car Wash, Inc.	1/17/2018	Charges involving theft against the City of Chicago.
John Balzano **349 W. 31st Street** **Chicago, IL 60616**	3/9/2018	Charges involving theft against the City of Chicago.
Natalie M. Balzano **349 W. 31st Street** **Chicago, IL 60616**	3/9/2018	Charges involving theft against the City of Chicago.
J & J Soft Cloth Car Wash **349 W. 31st Street** **Chicago, IL 60616**	3/9/2018	Charges involving theft against the City of Chicago.
John McClendon **7200 S. Exchange Suite A PO Box 490050** **Chicago, IL 60649**	4/15/2019	Indicted on charges involving fraud in relation to a City of Chicago contract.
McClendon Holdings & Affiliates 7200 S. Exchange Suite A **PO Box 490050** **Chicago, IL 60649**	4/15/2018	Indicted on charges involving fraud in relation to a City of Chicago contract.
Lester Coleman **7258 S. Halsted St.** **Chicago, IL 60621**	3/20/2020	Indicted on charges involving fraud in relation to Chicago Housing Authority contracts.
Coleman Development Corporation **7258 S. Halsted St.** **Chicago, IL 60621**	3/20/2020	Indicted on charges involving fraud in relation to Chicago Housing Authority contracts.