



Identifying the Gender-Gap in Financial White Collar Crime

*An Empirical Study on SEC Litigation Reports and the Impact
on Current White-Collar Crime Gender Theory*

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Executive Summary

Purpose: The purpose of this thesis is to explore whether there is a gender gap in white collar crime using a data-driven textual analysis of the Securities and Exchange Commission's (SEC) litigation releases. This paper aims to gather and process high quality evidence from SEC litigation reports to offer better insights to the academic community regarding the gender gap in white-collar crime. We also aim to analyse trends on the gender breakdown of groups that commit white-collar crime and the types of crimes each gender group is likely to commit.

Methods: We built an R based crawler to gather all the textual data on over 10,000 litigation releases. Each litigation release was referenced to a name database that accounted for over 32,000 first names recorded based on social insurance applications dating back to 1879. The most popular first names were used with the associated gender (male or female) included. The litigation releases were also referenced to a list of the most common white-collar crime related terms.

Findings: There is a large discrepancy between the male names tallied in the litigation releases in comparison to the female names. The overall percentage of female names lies between approximately 12% and 20% over the time period of 1995 to 2020. All-male groups accounted for approximately 38% of the crimes recorded and individual males accounted for 32%. Mixed-gender groups made up the bulk of the remainder with 24.5% of crimes recorded, while female individuals and all-female groups accounted for a mere 5% and 0.8%, respectively. Crimes that involved terms like "fraud", "trading", "insider", and "antifraud" were the most common. There was a peak period of litigation releases and therefore criminal activity between 2000 and 2005 with a consistent reduction in crime over time. On a per name basis, the percentage of male names that occur in litigation releases appear to slowly decrease from 1995 to 2020. Conversely, the percentage of female names appears to increase; if this trend were to be extrapolated into the future, the proportion of male and female names could potentially converge.

Research Limitations: The frequency of names mentioned in the litigation releases is reliant on how many times the defendant's name was mentioned in that filing. Due to this, the data obtained varies depending on the writing style of each litigation release. The names recorded and tallied do not always refer to the defendant's name and sometimes include the prosecutor

or investigators name. This associates the prosecutors name as committing a crime, which is inaccurate. Many individuals have last names that are common first names (i.e., Scarlett), which leads to double counting the number of guilty parties. This double counting also occurs in the crime term frequency as it is subject to the writing style of the litigation release.

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1. Introduction

1.1 Background

White-collar crime is an insidious problem for the global community. Corruption, fraud, embezzlement, and market manipulation reveal themselves to varying degrees in every political, financial, and economic system across the globe. Estimates of the cost of white-collar crime to companies in the United States range from \$200 billion (Touby, 1994) to \$600 billion per year (Association of Certified Fraud Examiners (ACFE), 2002). In comparison, this effect is significantly greater than street crime losses of \$3–4 billion (Baucus and Baucus, 1997) and total economic loss to victims of personal and property crimes of \$15.6 billion (Bureau of Justice Statistics, 1999) in the United States. Extrapolating to the global scale, white-collar financial crimes account for trillions of dollars of global economic losses annually. Despite this massive financial gap in white-collar crime versus street-level crime, white-collar crime remains one of the least studied topics in criminology (Schnatterly, 2003). As the gender gap in executive-level positions slowly narrows over time, more empirical evidence is needed to examine the gender gap in today's financial white-collar crime environment. This paper builds upon the theories of the 20th and early 21st centuries, using data-driven methodologies to identify the intricacies of the gender gap in financial white-collar crime in America.

1.2 Purpose of Research

Given the lack of research in the field of financial white-collar crime and little data-driven quantitative evidence, this paper aims to gather and process high quality evidence from SEC litigation reports to offer better insights to the academic community regarding the gender gap in white-collar crime. As the economic and occupational attainments of women continue to advance in modern societies, it becomes important to understand whether they are becoming more involved in white-collar crime as a result of their increasing access to more powerful occupational positions. Or, conversely, as women move into upper-level management positions, will their presence lead to reductions in white-collar crime in organizations?

The goal of this thesis is to develop a data-driven methodology to identify the gender gap in white-collar crime, analyze the results of the types of offenses committed, and observe the

make-up of the offending individuals or offending groups. Furthermore, analyzing the organizational characteristics of the offending firms will allow researchers and corporations to better understand what types of white-collar crime they are susceptible to based on the gender make-up of their executive board.

To achieve these goals, this thesis analyzes all litigation release data posted on the SEC website. To record and analyze the data, an appropriate data crawler algorithm was developed. Leading candidates include R and Python – however, R is most suitable for this analysis in order to remain consistent with current research methodologies. In addition, current web scraping methodologies were analyzed in order to minimize loss of information in building and applying an API to scrape data from the United States SEC litigation report database.

2. Theoretical Framework

In the following section, we develop a theoretical framework to explain trends in the outcome of our quantitative analysis of SEC litigation documents. We attempt to explain relevant theories of broader topics such as gender, crime, and equality in the United States, and then attempt to combine these theories to gain a better understanding of the results of the data we will be analysing in the following section. Using the work of other academic researchers in this field, as well as our own empirical study, we attempt to further the underlying theoretical perspective of the gender gap in United States financial white-collar crime.

2.1 Literature on Gender and Crime

A literature review is necessary to understand the leading theories as well as data collection and data analysis of past research work. Once completed, this review will aid in developing the scope of the research question and gaps in the current research. The field of white-collar crime research is relatively new and constantly evolving. It is important to identify if there have been effective methods in the past research to collect data and prove or disprove theories.

Much of the relevant work done by Benson & Gottschalk (2015), and Steffensmeier (2013) provides an up-to-date baseline for the current academic theoretical perspective on the role of gender in crime. Both Benson & Gottschalk (2015), and Steffensmeier (2013) attempt to provide evidence to the theories surrounding the gender gap in white-collar crime by developing quantitative studies demonstrating that as women gain increasing access to executive level positions, their likelihood to participate in white-collar crimes will not equate to the rate of participation in white-collar crimes as their male counterparts.

2.1.1 Benson & Gottschalk and Steffensmeier

Similar to the goal of our research paper, Benson & Gottschalk attempt to validate recent work in the field of gender and white-collar crime by extending it through a case study that examines the gender differences in Norway based on theories developed in the United States. Their study attempts to investigate whether high level white-collar crime in Norway is gender neutral or gender specific (i.e., mostly male) as it is in the United States. Benson &

Gottschalk find that the gender gap in Norwegian white-collar crime appears to be nearly identical to that observed in the United States, despite the fact that gender inequality in Norway is much lower culturally than in the United States. In conclusion, they find:

Formal gender equality does not appear to lead to increased involvement of women in white-collar crime, thus providing little support for the emancipation hypothesis and suggesting that theories focused on gendered focal concerns and gendered access to criminal opportunities have greater utility as explanations of the gender gap in white-collar crime (Benson & Gottschalk, 2015).

Through an empirical investigation of Norwegian media reports, Benson & Gottschalk find the current gender gap in Norwegian white-collar crimes media reports to be inconsistent with the narrative set forth in the emancipation hypothesis and further theories related to gendered access to criminal opportunities in the workplace. Before evaluating the methodology used in their data collection and analysis process, theories such as the emancipation hypothesis should be explored to gain a better understanding of their research.

The notion that greater gender equality will lead to increased female involvement in crime has been called the “emancipation hypothesis”. This notion was first put forth in the 1970’s by Simon and Adler and was developed to hypothesize that if given the opportunity, women would commit similar offenses to men and at a similar rate. This theory encompasses all crime and, for the most part, has been largely disproved at the street crime level (Steffensmeier et al., 1989; Steffensmeier and Streifel, 1992). However, little research has gone into applying the hypothesis to white-collar style crimes. Thus, there are theoretical reasons for thinking that the emancipation hypothesis may be more applicable to gender-focused involvement in white-collar crime.

Traditional criminological theory assumes that employment and economic stability tend to reduce rather than enhance the likelihood of crime, because such conditions presumably lead to reduced motivation and stronger stakes in conformity. Therefore, with greater labour force participation and improved economic status, gender equality should not be expected to increase women's involvement in traditional crimes. However, white-collar crimes are more likely to be occupationally based and are committed for the most part by people of considerably more economic status than ordinary street offenders (Wheeler et al., 1988;

Benson and Kerley, 2000). If the emancipation hypothesis were to be applicable to a form of crime, it would likely be applicable to the field of white-collar crime, where crimes are committed in an organizational setting and are occupationally based. This theory developed by Benson & Gottschalk can be used as a motivator for investigating whether this theory is supported or rejected by a quantitative analysis of SEC litigations released by the United States Securities and Exchange Commission.

In another key contribution, Steffensmeier discusses a competing theoretical framework, which was used in the investigations of women's involvement in high level corporate scandals in the United States (Steffensmeier et al., 2013). Like the findings of Benson & Gottschalk, Steffensmeier used data to investigate the gender gap in white collar crime. Using data obtained from convictions found in a database provided by the Corporate Fraud Task Force (CFTF), Steffensmeier and colleagues proved that women were significantly under-represented among the defendants in these high-profile white-collar cases. Specifically, in cases that lead to conviction, women were rarely leaders in cases involving multiple participants. In fact, women often played minor roles and received lesser profits in these high-level corporate crimes. Additionally, the career progression of many of these convicted women were far different than the progression of the careers of convicted men. In order to identify an explanation of these results, the researchers developed a sophisticated theoretical interpretation that integrated the ideas of sex-segregation and homosocial reproduction in criminal networks as well as the theory of gendered focal concerns promulgated by Steffensmeier & Allan (2000).

The concepts of sex-segregation and homosocial reproduction put forth by Steffensmeier & Allan (2000) are theorized to inhibit access to white-collar criminal networks for women, and thus their involvement in white-collar criminal opportunities. The gender-focused concerns of these theories also attempt to explain that women have less of an appetite to participate in higher-risk activities such as white-collar criminal enterprises than men. Even though Steffensmeier & Allan predict that the emancipation hypothesis would increase the level of involvement of women in white-collar crimes, the theories of sex-segregation and homosocial reproduction counter the emancipation hypothesis by restricting access to women's involvement in white-collar crime. This is consistent with concepts like the glass ceiling and gender discrimination in the labour market. The idea is that in labour economics we find glass ceiling and discrimination, which is a consistent mechanism of segregation by gender. These concepts lay a theoretical foundation for a potential hypothesis for a greater,

up-to-date data analysis of white-collar crime data. Have these concepts been confirmed with newer, up-to-date data, or are there new countervailing forces at play that need to be explained by a more robust data analysis? These insights are an important outcome of developing and evaluating data collected from a comprehensive textual analysis of SEC litigation data.

The content analysis of Benson & Gottschalk uses an amalgamation of news report data from several media sources across Norway. They attempt to rid political bias in their data by collecting data from a spectrum of left-, centre-, and right-leaning newspapers. In terms of data quality, they found it is difficult to assess the underlying truth of the gender-gap in white-collar crime using news reports. There is a slew of data quality problems that come with using media reports. For example, due to the current public perception that males are more likely to commit crimes in general, a news source is incentivized to publish a story about a female offender due to the perceived novelty. This novelty will likely lead to more interest from the public and result in an overestimation in women's involvement in white-collar crime in comparison to men. On the contrary, newspapers are more likely to publish larger scandals, which men are more likely to commit. This scenario would lead to an underestimation of women's involvement in white-collar crime in a content analysis report of Norwegian newspapers.

Benson & Gottschalk collected data from Dagens Næringsliv, Finansavisen and Aftenposten (2009–2012) to identify stories reporting on white-collar crime cases using several criteria. The person(s) identified in the story were considered to be white-collar criminals if they met the following criteria: (1) he or she committed an offense in a deliberate and purposeful manner as part of professional activity linked to regular business activities; (2) the offense involved large sums of money or large losses for others; (3) the offender was portrayed in the paper as being successful and having high social status and a position of some power and access to organizational resources (Sutherland, 1940; Braithwaite, 1985; Geis, 1996).

The data collection methodology used by Benson & Gottschalk is inherently biased as only white-collar crimes that are deemed newsworthy are recorded. Their data is limited to the content of the reports by Norwegian media sources and may potentially miss the greater scope of all relevant white-collar crime indictments. Our research attempts to minimize this phenomenon by using official data published by the SEC, which by their policy must report all litigation releases rather than just the high-profile cases. It is also important to recognize

that both the work of Benson & Gottschalk and our research may have findings that are not generalizable to the broader population of undetected or unprosecuted white-collar cases. However, this characteristic also makes our analysis comparable to the bulk of the work done on the gender-gap white-collar crime in the United States, which has relied heavily on cases selected from official records (e.g., Daly, 1989; Holtfreter, 2005; Brickey, 2006; Steffensmeier et al., 2013).

The content analysis report by Benson & Gottschalk identified 162 cases of white-collar crime from the years 2009-2012. Of those 162 cases, 329 white-collar criminals were identified. 60% of the 162 cases involved only one person, and the 40% of remaining cases involved a broad range of individuals—from 2 to 16 criminals (average = 3.5 individuals per criminal network). Of the 64 cases involving a criminal network, 50 were all-male networks and 14 were mixed-sex networks. There were no all-female networks.

Furthermore, Benson & Gottschalk broke down the data collected from the content analysis into further variables of interest. The results of their findings are broken down into three subsections. First, they present from their findings whether white-collar crime in Norway is gender neutral or gender specific. Second, they examine how men and women differ regarding the nature of their white-collar offenses (type of crime) and their roles in those offenses (occupational level). Third, they explore the role of women and their involvement in criminal networks. These findings are presented in Appendix – Table 1.

The findings of Benson & Gottschalk are consistent with the theory and hypothesis that there is indeed a gender-gap in white-collar criminal enterprises in Norway. The next step in their analysis was to determine if women are over-represented or under-represented in high-level white-collar crime. They used the labour participation rate of women in high-level job positions in organizations and compared it to the descriptive statistics found in their analysis as a proxy to determine if women were offending at the same opportunistic rate as their male counterparts. Using gender employment data from Reimann (2012), Benson & Gottschalk were able to determine that their rate of participation in crime is substantially below their level of access to opportunities to commit high level white-collar criminal offenses. To further their analysis, Benson & Gottschalk break down the types of experiences of each gender represented in each white-collar crime case. They compare women to men regarding the types of offenses they commit, the number of people involved in their offenses, the primary beneficiary of the offense, the sector of the economy in which the offender is

employed, the individual's occupational position, and the individual's role in the offense. Finally, they examine the role of women in white-collar criminal networks to determine if women are likely to offend alone or as part of a criminal network. If they are part of a criminal network, are they a leader or a follower? Are these criminal networks one gender or are they mixed? What are the average sizes of these groups and what crimes are they likely to commit as a group or as solo offenders? The results of this analysis are shown in Appendix – Table 2 and offer insightful evidence of the group dynamics of white-collar criminals. This type of statistical breakdown acts as an academic standard to apply to the analysis of the findings of our up-to-date SEC litigation data.

Evaluating the effectiveness of each of these metrics is useful in developing a strategy for analysing the data we extract from a comprehensive analysis of SEC litigation data to maintain consistency amongst the research field of the gender gap in white-collar crime.

After analysing the findings of Benson & Gottschalk, as well as the findings of the CFTF data procured by Steffensmeier (2013), there is consistent evidence that women simply do not commit white-collar crimes at the same rate as their male counterparts, given the same opportunity. In addition, women are unlikely to work alone committing these offenses, and almost always act as a follower in a mixed-sex criminal network. Whether as a solo offender or part of a mixed-sex criminal network, women are far more likely to commit acts of fraud or market manipulation, rather than crimes of theft or corruption. These insights are further proven to be plausible as the evidence remains consistent with earlier studies lead by Steffensmeier et al.

These findings are important to note as we begin to develop a hypothesis surrounding the involvement of women in white-collar crime in the data scrubbed from the SEC litigation release database. It is especially important to note that women often act as a part of a greater criminal network based on earlier studies, and a goal of our research is to determine if the findings of the SEC litigation release analysis remains consistent with these findings, or if over the last decade, these findings have become outdated and we must attempt to find the difference in how women have offended in terms of white-collar crimes over this updated time frame. In the next section, we will begin to put together a theoretical framework based on earlier quantitative work by Steffensmeier (2012), Benson & Gottschalk (2015); as well as updated theoretical work done in the white-collar crime space. From there, we hope to

encapsulate an up-to-date theoretical perspective to apply to a quantitative analysis of SEC litigation data collected by a custom web-scraping API.

Research in the white-collar crime space has been hindered by a lack of consensus regarding operationalization of the term “White-Collar Crime” (Simpson, 2013). The academic debate surrounding what defines white-collar crime, and what assumptions this research paper has made, will be covered in a later section. One of the main points of contention in white-collar crime research focuses on why individuals or groups of individuals elect to participate in these types of crimes. The interrelated challenges of defining, measuring, and accurately reporting the intricacy of behaviours that construct the concept of white-collar crime makes specifying causal mechanisms especially challenging. The research community has generally broken down identifying causal mechanisms into two broad categories; (1) demographic characteristics of white-collar offenders, and (2) organizational characteristics of the firms’ likely to be vulnerable to a white-collar offender in its ranks. In regard to the former, Holtfreter and Wheeler have identified a consistent profile of what is often referred to as the “typical” white-collar offender as an educated, white, middle-class male in his early 40s who holds a managerial or executive-level position in an organization (Holtfreter, 2005; Wheeler et al., 1987). The different organizational characteristics that correlate to higher levels of white-collar crime are variables of interest and will be analysed as a corollary goal of this paper. Historically, demographic characteristics of white-collar offenders have been examined in contrast to street-level crime offenders, and for individual types of occupational and corporate offenses. It is generally agreed upon in the academic community that males are more involved in all types of crime than females, however, there appears to be a smaller gender gap for some types of white-collar offenses. Holtfreter attributes this to the opportunity structure of Corporate America; women often do not hold positions of power that would permit them to engage in high-level forms of corporate crime committed by their male counterparts (Holtfreter, 2015). There is some underlying evidence that attempts to explain the difference in motives and methods of female-driven crime, in that women more often commit offenses out of financial need for their families and often tend to offend alone (Daly, 1989; Klenowski et al., 2010; Zietz, 1981). The caveat of these findings when applied to the corporate structure of 2021 Corporate America, is that the times have changed – do these theories still hold up today?

However, in both studies, they find that there are situations in the workplace where women might become more susceptible to participating in a white-collar crime scheme. These

findings both validate and invalidate the emancipation hypothesis set forth in these studies, and it becomes clear at this point in time that the role of gender in white-collar crime research is more nuanced than current theories suggest. A corollary goal of this study is to provide evidence to the academic community to either a) validate the theories surrounding the emancipation hypothesis set forth by Simon and Adler in the 1970's, or b) validate the theories of Benson & Gottschalk (2015), and Steffensmeier (2013) and hence invalidate the emancipation hypothesis, whilst also contributing to the nuanced theoretical perspective of the role of gender in white-collar crime.

2.2 Financial White Collar Crime in the United States

In order to develop an effective quantitative study on the phenomena of white-collar crime in Corporate America, we must first identify a theoretical baseline perspective on the concept and evolution of white-collar crime. Since the field of what defines white-collar crime is so newly studied by the academic community, we must be able to analyse the data we retrieve using current ideologies of what constitutes white-collar crime in Corporate America today. Much of the theoretical perspective used to analyse the data retrieved from the SEC litigation database will be based off of the work of Reurink (2016) that examines the evolution of white-collar crime from its inception in the 1970's, to a current perspective on the field of white-collar crime. The goal of understanding how white-collar crime has developed over the years will give us a better understanding of how to evaluate the results of our analysis, to contribute relevant work to the white-collar crime research community.

In the paper published in 2016, Reurink conceptualizes the way in which the empirical profile of white-collar crimes has evolved over the past decades and especially how the locus of such crimes has shifted away from industrial corporations to the financial services industry. After the events of the 2008 financial crisis, academic observation of white-collar crime phenomena has shown instances of predatory lending to disadvantaged borrowers, widespread mis-selling of interest-rate swaps to small and medium enterprises, financial statement fraud related to structured investment products, and the manipulation of key financial benchmarks are only a few of a long list of possible examples.

The development of what defines white-collar crime has changed significantly over the years and identifying where white-collar research has been and where it is likely to go is an

important caveat when determining what types of crimes, we should be attempting to classify in our quantitative analysis of SEC documents.

2.3 Research Question and Expectations

As the economic and occupational attainments of women continue to advance in modern societies, it becomes important to understand whether they are becoming more involved in white-collar crime because of their increasing access to more powerful occupational positions. Or, conversely, as women move into upper-level management positions, will their presence lead to reductions in white-collar crime in organizations?

In all part of our analysis, we expect women to participate in white-collar crimes at far lesser rates than their male counterparts. However, it will be interesting to evaluate the types of white-collar crimes women tend to commit in comparison to their male counterparts. We believe crimes that have a less-defined victim will be crimes that women are likely to commit based on the gender theories of Benson & Gottschalk (2015), and Steffensmeier (2012). Following the same theories of these scholars, we believe women to act alone far less than their male counterparts, and when women act as part of a criminal network, we expect the network to be majority male and the female will take on a follower role in the network. We believe there to be very rare circumstances of all-female criminal networks as this configuration does not support the current gender theory on the ways that women offend in the workplace.

Using the findings of a comprehensive analysis of SEC litigation documents we hope to gather and present data that will be of value to the academic community on the presence/lack of a gender gap in financial white-collar crime. Furthermore, we hope to identify and present the types of crimes that women have been convicted of committing from 1995 to 2020 and compare these rates to the rates of their male counterparts. We aim to identify trends in different areas of crime and provide evidence to be used in a later investigation to forecast the criminal rates of both men and women going into the future. Finally, we aim to provide data surrounding the typical network that female white-collar criminals operate in and compare it to their male counterparts. This investigation focuses on the academic question of if women are more likely to act alone, in a same-sex criminal network as a leader/follower, or in a mixed-sex criminal network as a leader/follower.

2.4 Hypothesis

To speculate whether men or women commit more white-collar crimes there are various confounding variables to consider.

Firstly, women are disproportionately misrepresented in executive leadership and board positions which would hinder them from participating in white collar crimes. This would lead to a smaller percentage of white-collar crimes committed by women, but that does not necessarily mean, given equal opportunity, that the same scenario would occur. Since 1995 women are having more representation in leadership positions, so one would expect to see an increase in white collar crimes throughout this period.

Secondly, the group make-up and size is important variable to consider. All male groups versus all female groups will be compared as opposed to counting the number of men in an all-male group and comparing to the number of women in an all-female group.

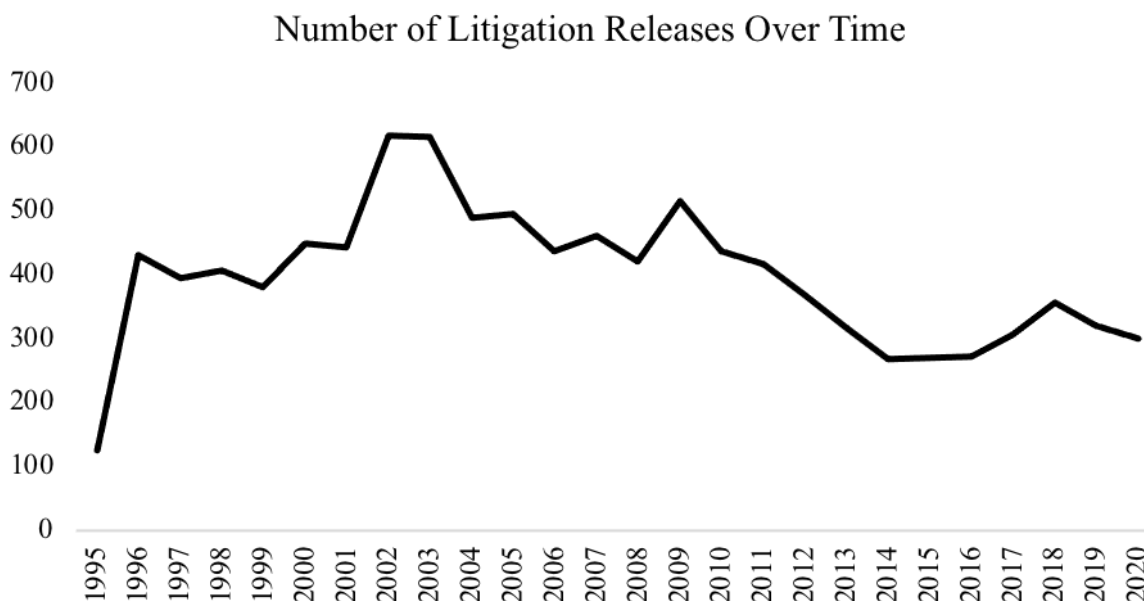
We expect that the SEC litigation releases are going to have more male names than female names, but the configuration of male and female criminal networks that are convicted of white-collar crime will be an interesting to analyse as the rate of participation of women in executive level positions has increased over time. We expect similar results to the findings of Benson & Gottschalk, and Steffensmeier et al for coinciding time periods, but expect different trends (i.e. diminishing gender gap) over the last decade as the gender breakdown of executive boards has changed over this time span. We believe the increase in diversity will lower crime rates over the last decade, and criminal networks will evolve with this change.

3. Data

3.1 SEC Litigation Releases

The data for our textual analysis was gathered from the Securities Exchange Commission (SEC) website, specifically under the litigation release sections. The litigation releases represent all civil lawsuits brought by the commission in federal court (*Litigation Releases*, n.d.). These releases provide an unbiased collection of white-collar crimes. This data ranges from September 20th, 1995 to present day and has over 10,000 litigation releases. These releases contain the unique litigation release number, the date when the release was public, headings that usually have the name of the guilty party and paragraphs of text describing the specifics of the crime committed. Figure 1 below shows the number of litigation releases recorded on the SEC site over time.

Figure 1 - Litigation Releases on SEC



The format of the data is consistent over the years but has a slight change from txt format to html format on April 30th, 1999 (Litigation Release (LR) 16129). Additionally, between May 3rd, 1999 (LR 16130) and March 31st, 2006 (LR 19365) the website URL of the litigation releases did not contain the year in which the release was published, where it did after March 31st, 2006 and has remained identical until the most recent litigation released published in 2021.

3.2 Data Collection, Manipulation, and Analysis Software

We created a R based web crawler to go through the over 10,000 litigation release documents on EDGAR (the SEC's Electronic Data Gathering Analysis and Retrieval system). The crawler recorded the LR number, the year, and all the text on that page. This was done using two loops nested together along with conditional statements that accounted for the small URL changes that were mentioned in Section 4.1. The first loop ran through all the years from 1995 to 2021 and the second loop cycled through the litigation numbers that were present in that year. The litigation number start, and end numbers were manually recorded separately in a excel file, which was then read into the R to be specific on when the LR number change corresponded to a year change. A small section of this data is shown in Table 1.

Table 1 - Litigation Number Beginning and End for each Year

Year	LR Number Start	LR Number End	Number of LRs
1995	14644	14769	125
1996	14770	15202	432
1997	15203	15599	396
1998	15606	16013	407
1999	16014	16396	382
2000	16397	16846	449
2001	16847	17291	444
2002	17292	17911	619
2003	17912	18528	616
2004	18529	19019	490

This crawler accesses the SEC website multiple times in a fraction of a second. The trouble with this is the SEC has a limit on the rate at which data can be accessed by the IP address of a user. To account for this limit, the crawler stops for 0.11 seconds before iterating through another cycle, thus allowing the program to be as fast as possible yet not exceeding the SEC limits and therefore not causing an error to occur before all the data has been obtained.

This crawler also needs a failsafe to account for the litigation release numbers that should be next but are not. For instance, as shown in Figure 2, one will notice that the LR-19709 document is non-existent. To overcome this a function was used along with a conditional statement to see if there were any lines read by the readlines function. If the readlines function came back with zero data, the crawler would immediately run to the next loop iteration.

Figure 2 - Missing Litigation Number Example

LR-19710	May 23, 2006	Federal National Mortgage Association Other Release No.: AAER-2433 See also: Complaint in this matter
LR-19708	May 22, 2006	James Tambone and Robert Hussey See also: Complaint in this matter
LR-19707	May 22, 2006	Focus Financial Associates, Inc.

3.3 Pre-processing and Cleaning

The generated data frame consists of the year, the litigation number, and the raw text that was obtained through the readlines function. For the data that was recorded under html format a lot of cleaning is required. Even though the URLs are very consistent for this data, the textual data on these sites are organized very differently. To effectively clean this textual data a lot of manual analysis of how the information is laid out and how that changes overtime was needed. With the help of regular expressions, the html structure was removed. This raw text format was converted to a cleaned text column where the textual data was then converted to lowercase characters, words under three letters were removed, punctuation was removed, digits were removed, and then all put into a character vector. Lastly, the words were then tokenized, so each document had several words associated with it.

The adjustments to the raw textual data were necessary to effectively compare the names within the text to popular names from an external source. Additionally, the types of crimes in the textual data had to match the types of crimes that were searched for in the manually created list.

Analysing textual data is a difficult task as the information of interest can be expressed in an uncountable number of ways. The information that is helpful to help draw conclusions or support current theories on gender gaps in white collar crimes are the names of individuals, the gender of individuals, the types of crimes committed, the punishment for the crime, the duration of the crime, the size of the guilty parties, among others. The data obtained from the SEC litigation release section is partially standardized when it comes to litigation number and date, but the presentation of types of crimes, individuals involved, gender of individuals, and duration of the crime are all subject to writing style differences and lack any clear structured outline.

As a way of identifying gender, the names of the individuals are used, and it is estimated what gender they are by the probability of that name being historically male or female. This

probability associated with a gender of a name can be evaluated using the “gender” function in R or by using datasets that have a probability associated with them. To supplement the names and corresponding gender the analysis should also include a frequency counter for how many times that name occurs.

For the crimes committed there are broad categories that specific crimes fall into. The Federal Bureau of Investigation (FBI) classifies white collar crime into the following categories: Corporate Fraud, Money Laundering, and Securities and Commodities Fraud. There are numerous other terms within these overarching categories: Ponzi schemes, market manipulation, and embezzlement, among others. These terms can be referenced to identify the type of crime committed in the litigation releases on the SEC. In a similar fashion to the names, the types of crimes that come up in the SEC releases should be counted and recorded for each litigation release.

4. Methods

4.1 Gender Statistics of Financial White Collar Crime

To identify gender specific names in the text of over 10,000 litigation releases a database of first names in the United States from 1879 to present day was used. In this database there were four columns: Name, Gender, Frequency, and Included. The gender column had values of “M” or “F” and the included column had values of “Yes” or “No”. The original dataset contained 32,952 observations. Having a frequency of over 50 for that name gave the observation an included value of “Yes”.

To analyse whether a name occurred in a litigation release document a nested for loop was used to iterate through all the tokenized words in all 10,305 documents and then iterate through all the names in the gender specific name database. To reduce the number of values to iterate through it was decided to only include names that had a frequency of above 50. This brings down the number of observations to 5,700. Not only does this speed up processing time, but it also reduces the chances of names in the dataset being assigned to words in the litigation release. An example of this would be the name “An” this clearly would be picked up in thousands of SEC releases, however, it would much more likely be used as the indefinite article used before words beginning with a vowel sound rather than someone’s actual name. To further decrease the processing time and to reduce contamination of the data names that also correspond with months in the year. Finally, the names of each state were removed from the gender name database as the litigation releases are more likely to have “Georgia” referring to where the crime was committed (Georgia) as opposed to someone’s name. A separate customizable list was created to further reduce the gender database that contains words like “cash”, and “america”, this list is easily appended if one finds certain names coming up frequently that are not pertaining to the names of convicted people.

Table 2 shows a sample set of frequency of a given name extracted from the litigation release and the likely gender associated with that name.

To analyse the crimes that were present in these litigation releases an approach a similar approach to names was used. The types of crimes were identified based on the following terms:

“fraud”, “laundering”, “embezzlement”, “insider”, “trading”, “antifraud”, “defrauding”, “defrauded”, “defraud”, “fraudulently”, “misrepresent”, “misrepresentation”, “Ponzi”, “pyramid”, “manipulation”, “corruption”, “theft”

The use of terms fraud, manipulation, corruption, and theft were terms informed by Benson & Gottschalk.

These terms were counted how many times they appeared in a litigation release if they appeared at all. In Table 3 below you can see a sample set of the crime names, frequency, and corresponding LR Number.

Table 2 - Name Frequency Table

Table 3 - Crime Frequency Table

Name	Frequency	LR Number	Gender	Year	Crime	Frequency	LR Number	Year
randall	2	14644	M	1995	fraudulently	1	15655	1998
nelson	2	14644	M	1995	defrauded	1	15655	1998
garrett	3	14644	M	1995	antifraud	1	15655	1998
philip	2	14647	M	1995	trading	5	15653	1998
joseph	2	14647	M	1995	fraudulently	1	15651	1998
john	2	14647	M	1995	fraudulently	2	15650	1998
ernest	2	14647	M	1995	antifraud	1	15650	1998
richard	2	14649	M	1995	antifraud	1	15649	1998
owen	3	14649	M	1995	trading	4	15649	1998
michael	3	14649	M	1995	trading	2	15646	1998
franklin	7	14649	M	1995	insider	2	15646	1998
fox	7	14649	M	1995	antifraud	2	15645	1998
douglas	3	14649	M	1995	trading	1	15645	1998
bruce	3	14649	M	1995	fraud	1	15645	1998

Lastly, the number of female and male names were counted for each LR Number. This is shown in Table 4.

Table 4 - Number of Male and Female Names in Each Litigation Release

LR Number	Number of Female Names	Number of Male Names	Year
15656	0	1	1998
15655	0	2	1998
15654	0	1	1998
15652	0	1	1998
15651	0	5	1998
15649	0	1	1998
15646	0	2	1998
15645	0	3	1998
15644	0	4	1998
15643	0	3	1998
15642	0	1	1998
15640	0	3	1998
15639	0	1	1998
15638	0	2	1998

With the above three data frames the names of individuals, the crimes committed, and the frequency of male/female names are all recorded and able to be analyzed. These three data frames were put into a master data frame to apply queries and subsets in order to make informative plots and tables. This is shown in Table 5.

Table 5 - Master Table

Crime	Frequency of Crime	LR Number	Name	Frequency of Name	Gender	Number of Female Names	Number of Male Names	Year
antifraud	1	25087	ross	9	M	1	2	2021
antifraud	1	25087	penny	2	F	1	2	2021
antifraud	1	25087	logan	8	M	1	2	2021
defrauding	1	25086	randall	5	M	0	1	2021
antifraud	1	25086	randall	5	M	0	1	2021
antifraud	1	25085	king	10	M	0	1	2021
antifraud	1	25079	jones	6	M	0	1	2021
theft	1	25075	penny	2	F	1	0	2021
antifraud	1	25075	penny	2	F	1	0	2021
fraud	2	25075	penny	2	F	1	0	2021
defrauded	1	25073	will	2	M	0	1	2021
trading	3	25073	will	2	M	0	1	2021

4.2 Limitations

There are many limitations to the data collection performed as assumptions and simplifications must be made to make this task possible.

Firstly, for the names that were recorded in the tokenized words of the litigation release the frequency was also recorded. This frequency is likely to have some variance between documents based on how many times the defendant's name was mentioned in that filing. Secondly, not all names mentioned in the litigation releases indicate the defendant. In many scenarios in the SEC's litigation releases the prosecutors or investigators names were mentioned. Thirdly, many individuals have surnames that are also first names (i.e. Scarlett), these surnames were recorded as well as the individuals first name, therefore double counting the amount of guilty parties. The justification for these issues relates to how large the dataset is. In many instances someone's last name is counted as a first name, or a prosecutor's name is mistaken as a guilty party's name, however over the scope of 10,305 documents it is our stance that these issues are negligible.

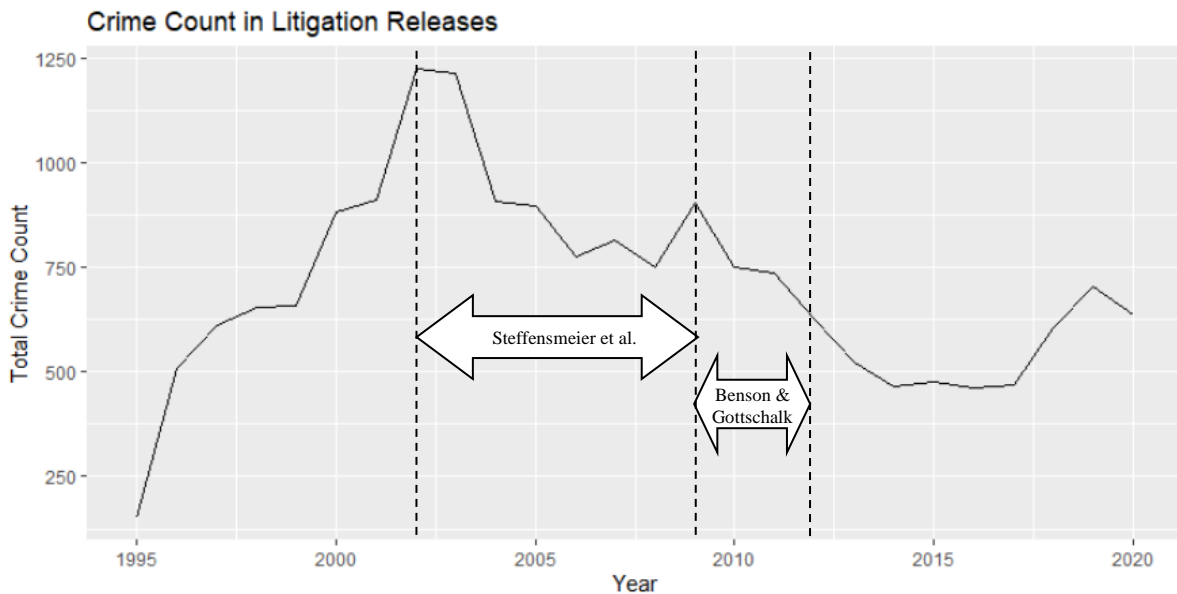
If there are certain individuals who prosecute or investigate a large number of crimes the names of those individuals should be removed from the gender name data set by the customizable list mentioned early.

When identifying the titles of various crimes some limitations are due to the limitations for the crime title database. There will be some double counting of crimes due to the variance within the writing of the litigation release. For instance, some documents may claim that the defendants violated the antifraud act whereas other documents would say the defendants fraudulently mislead investors, or something of that nature. To only include the term “antifraud” or “fraudulently” would miss many crimes stated in the releases.

5. Results

Figure 3 below shows the total crime count in the SEC litigation data using the terms outlined on page 22 of this report. In 2001 and 2002, the total crime count reached a peak of approximately 1200 total crimes. Local peaks occurred in 2009 and 2019 with total crime counts of approximately 880 and 680, respectively.

Figure 3 - Crime Frequency in Litigation Releases



We have included the time spans of the Steffensmeier and Benson & Gottschalk studies as reference for future studies to compare the trends of our results to these previous studies. Figure 4 below shows the minimum percentage of females to be approximately 12% of names tallied to a maximum percentage of 20% from 1995 to 2020.

Figure 4 - Frequency of Male and Female Names in LRs

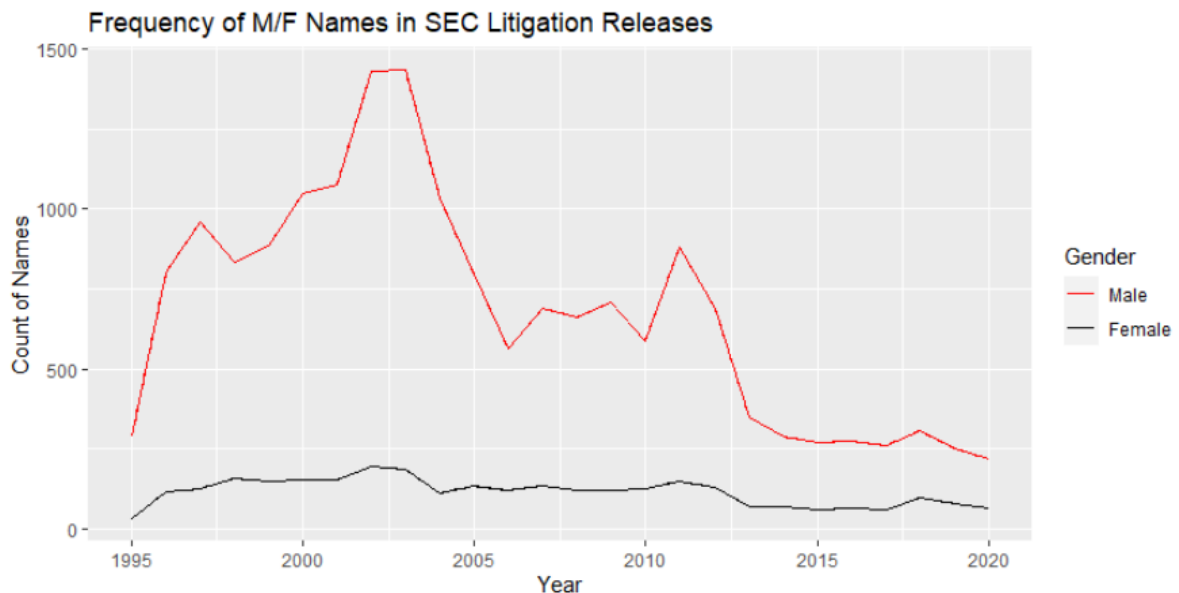
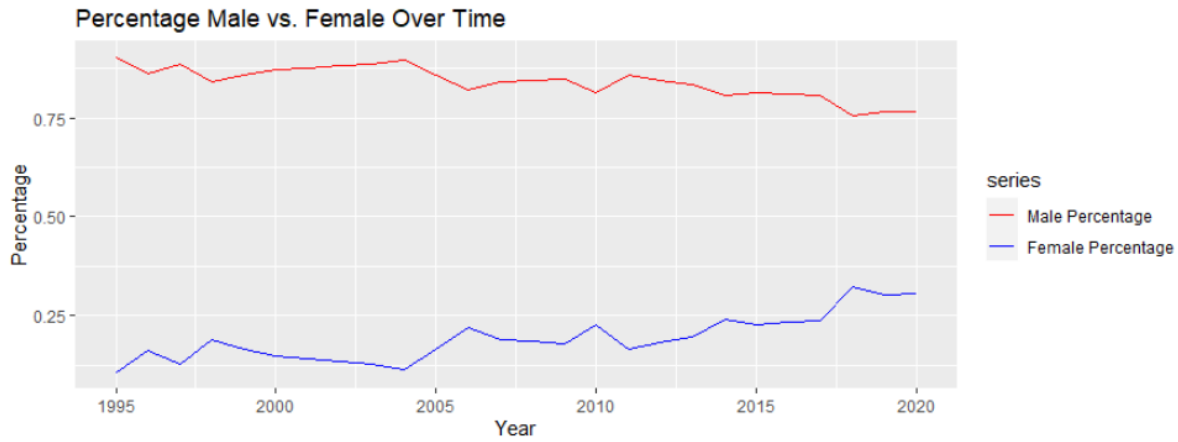


Figure 5 below depicts the share of male and female classified crimes committed over time.

Figure 5 – Percentage of Male and Female Names



A similar table was created to the Benson & Gottschalk table where the number and percentage of Male and Female names apparent in the crimes were shown along with the types of crimes committed. The most notable crime terms of the remaining groups relate to trading, antifraud, insider, and Ponzi. Table 6 is a partial recreation of the Benson & Gottschalk table highlighting the number and percentage of males and females and the types of crime committed. Table A1 for reference is also shown here.

Table 6 – Portion of Benson & Gottschalk recreated table with LRs

Benson & Gottschalk Table		
Gender	N	Percent
Male	65,176	80.6%
Female	12,655	19.4%
Crime Type		
Fraud	9,709	28.5%
Theft	148	0.4%
Manipulation	759	2.2%
Corruption	17	0.0%
Antifraud	4,515	13.3%
Defrauding	495	1.5%
Defrauded	988	2.9%
Defraud	412	1.2%
Fraudulently	1,420	4.2%
Laundering	289	0.8%
Embezzlement	33	0.1%
Insider	3,340	9.8%
Trading	9,887	29.1%
Misrepresent	57	0.2%
Misrepresentatic	31	0.1%
Ponzi	1,701	5.0%
Pyramid	228	0.7%

Table A 1 - Benson and Gottschalk Table

	N	Percent
Gender		
Male	307	93.3
Female	22	6.7
Crime Type		
Fraud	151	45.9
Theft	24	7.3
Manipulation	95	28.9
Corruption	59	17.9
Occupational Level		
Top Level (Chariman, CEO)	95	28.9
Middle Level (Lawyer, Investor)	151	45.9
Bottom Level (Accountant, Assistant)	83	25.2
Sector Employed		
Private	304	92.4
Public	25	7.6
Corporate or individual beneficiaries		
Corporate Entity	41	12.5
Individual or individuals	288	87.5
Role in the offense		
Leader	192	58.4
Follower	137	41.6

Below one can see a Table 7 describing the type of crime along with whether it was committed by an all-male group, all-female group, mixed group, a male individual, or a female individual. This table is similar to Benson & Gottschalk’s, with some minor differences discussed below. Table A2 is shown here as well for reference.

Table 7 - Group Make up Benson & Gottschalk Partial Recreation

Benson & Gottschalk Table 2										
Offense Characteristics	All Male Groups		All Female Groups		Mixed Sex Groups		Male Solo Offenders		Female Solo Offenders	
	N	%	N	%	N	%	N	%	N	%
Number and % In Sample	2,706	37.9%	56	0.8%	1,746	24.5%	2,261	31.7%	363	5.1%
Type of Offense										
Fraud	1,568	38.9%	35	0.9%	1,034	25.6%	1,209	30.0%	189	4.7%
Theft	28	31.1%	-	0.0%	24	26.7%	32	35.6%	6	6.7%
Manipulation	116	27.7%	3	0.7%	156	37.2%	113	27.0%	31	7.4%
Corruption	1	6.7%	1	6.7%	9	60.0%	2	13.3%	2	13.3%

Table A 2 - Benson & Gottschalk Table

Offense Characteristics	All Male Groups		Mixed Sex Groups		Male Solo Offenders		Female Solo Offenders	
	N	%	N	%	N	%	N	%
Number and % in sample	50	78	14	22	91	93	7	7
Type of offense								
Fraud	18	36	10	71	41	45	3	43
Theft	2	4	1	7	10	11	0	0
Manipulation	15	30	3	21	34	37	4	57
Corruption	15	30	0	0	6	7	0	0
Co-conspirators								
Small group (2-4)	44	88	9	64	n.a.		n.a.	
Medium (5-7)	3	6	4	29	n.a.		n.a.	
Large (8+)	3	6	1	7	n.a.		n.a.	
Beneficiary								
Corporate	8	16	2	14	8	9	0	0
Individual	42	84	12	86	83	91	7	100
Female Leaders								
Yes	n.a.		6	43				
No	n.a.		8	57				

Figures 6 through 9 depict fraud crimes, trading crimes, Ponzi crimes, and how all crimes trend over time depending on group or individual make up.

Figure 6 - Fraud

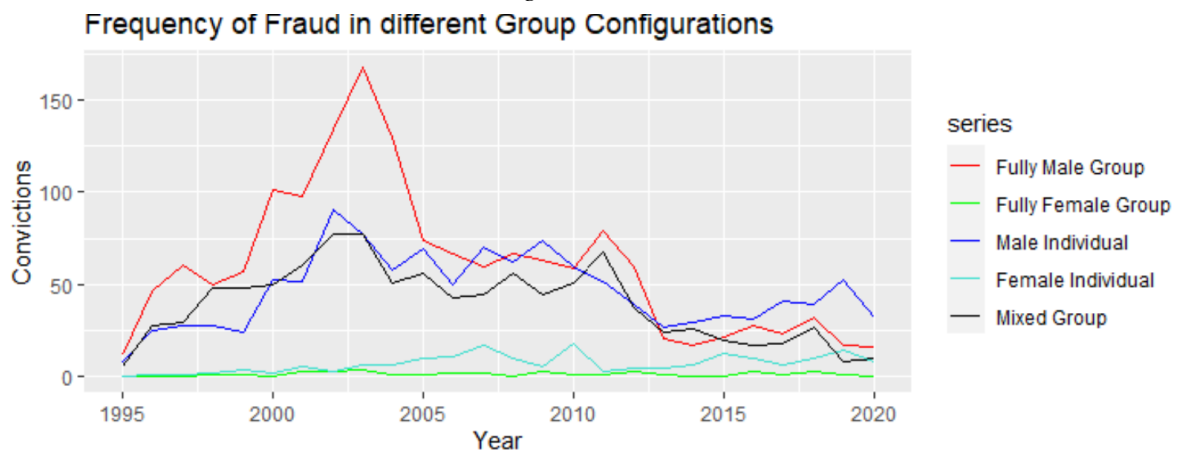


Figure 7 – Trading

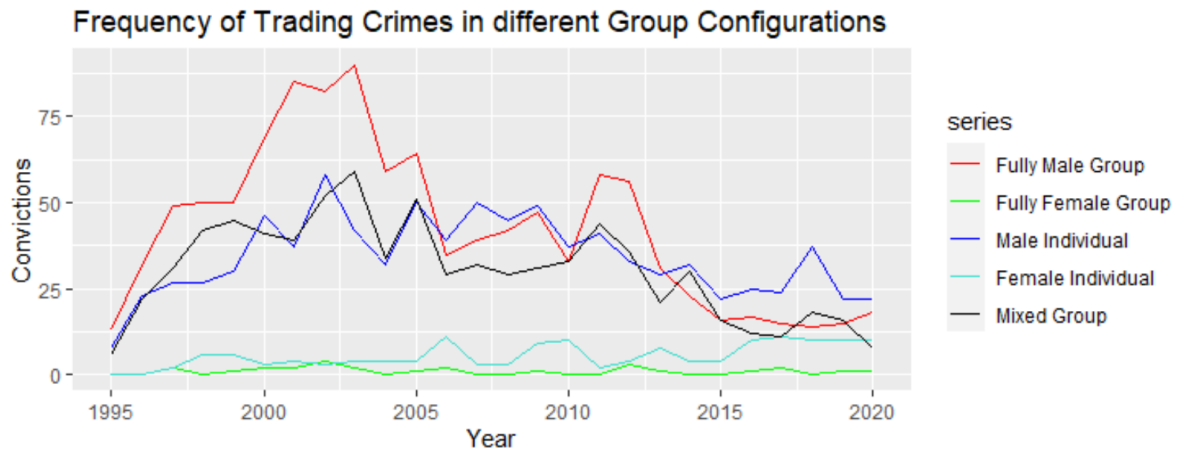


Figure 8 – Ponzi

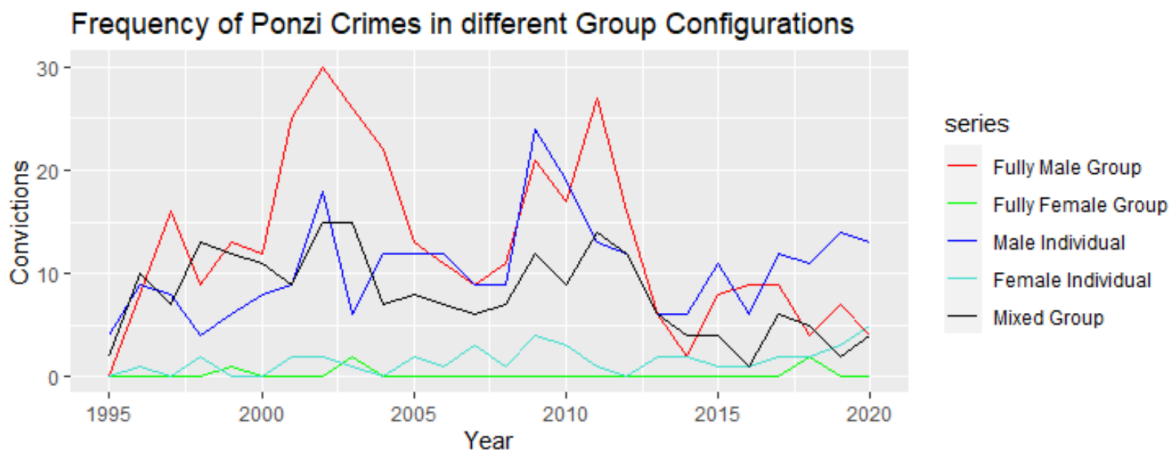
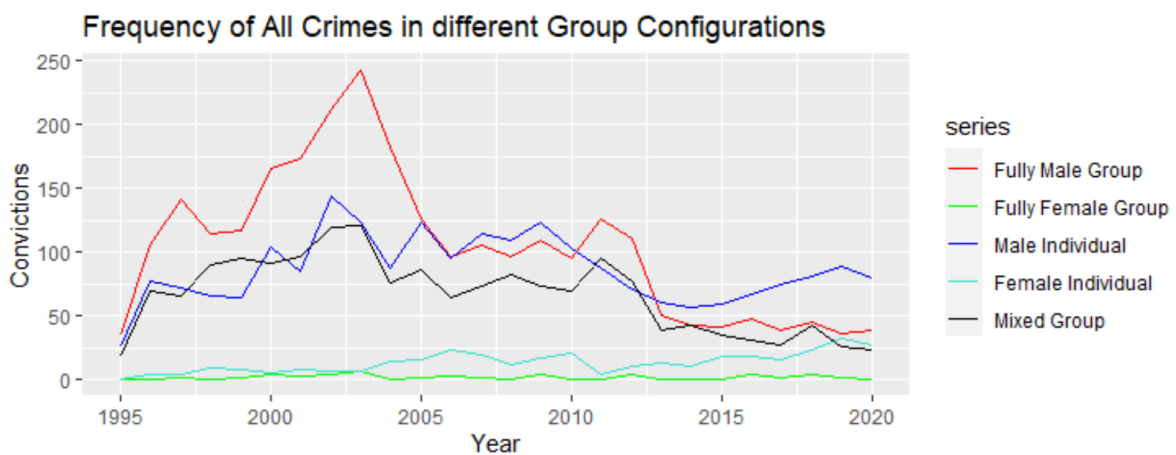


Figure 9 – All Crimes



In Figure 9 we observe the frequency of crimes committed in different group configurations. Most of the crimes in the first part of the sample period are committed by fully male groups. In 2005, there is a turning point where most of the crimes tend to be committed by single males. The fully female groups or individuals tend to be the least represented. The mixed

groups follow the trend of the fully male groups, but at a much lower absolute rate. In 2013 the mixed and male groups begin to converge to similar numbers.

For each crime committed the general trend remains consistent. All-male groups, male individuals, and mixed groups are consistently larger than female individuals and much larger than all-female groups.

6. Discussion

The main goal of our research was to develop and apply an advanced quantitative methodology to study the relationship between gender and white-collar crime from 1995 to 2020. Using this framework, we can compare the data we procured in comparison to the results of Benson & Gottschalk (2015) and Steffensmeier et al (2013), as well as data procured in years after these studies were published. We focused on presenting our results in a way that can be compared to earlier studies by focusing on three main aspects of gender and white-collar crime: (1) Is white-collar crime in the United States gender neutral or specific? (2) How do men and women differ in regard to the nature of their white-collar offenses? (3) How do women fit into modern criminal networks in comparison to their male counterparts? In addition, there are several distinct differences between the quality and type of data examined in our study and the data examined in the studies completed by Benson & Gottschalk, and Steffensmeier et al. First, Steffensmeier et al. used a high-quality dataset that looked at indictments, rather than examining convictions as was the case in our study and Benson & Gottschalk's study. Steffensmeier covered major indictments initiated by the Corporate Fraud Task Force (CFTF) in the wake of the Enron scandal, covering cases from July 2002 through 2009, with most occurring between 2003 and 2006. Whereas Benson & Gottschalk analyzed convictions that were covered in major Norwegian newspapers from 2009 to 2012. Despite these differences, the results of all three studies were relatively similar during the coinciding time spans.

As we observe in the results, white collar crimes are less likely to be committed by fully female groups. This likely reflects issues such as the glass ceiling and reduced female participation in the labor market, where female criminals are less likely to have a pool of available females with whom to create criminal networks.

As shown in Table 6, white-collar crime in the United States is not gender neutral during the period of 1995-2020, however the gender gap is slowly decreasing not because of higher criminal activity by women, but by a consistent decrease after 2011 of male-dominated crime. Our analysis presents a total female white-collar crime participation rate of 19.4%, but this average ranges from 12% to 20% from 1995 to present day. During the time span of the studies conducted by Benson & Gottschalk and Steffensmeier et al, the gender gap was noticeably larger and coincides with the findings of these past studies. Our findings do have

differences compared to the results of Benson & Gottschalk. Despite these small differences, both sets of findings share similar traits. In both studies, women commit crimes typically in groups with other men as they show very low percentages for all female groups or committing crimes by themselves. The types of crimes that Benson & Gottschalk used were Fraud, Theft, Manipulation, and Corruption. These terms are not as apparent in the SEC litigation releases as shown by Table 1. One rationale for this discrepancy is that the litigation releases have more formal legal language and are less likely to have colloquial terms that would be found in a newspaper. Past the dashed line in Table 1 you can see the remaining terms that were tallied but not used in the study of Benson & Gottschalk. Our percentage statistic in Table 6 is based on total of all groups and individuals, whereas Benson & Gottschalk calculated percentage of groups and percentage out of individuals. Table 7 also has an all-female group section, whereas Benson & Gottschalk did not. This section was potentially left out due lack of data on all female groups.

Based on our findings, there are differences in the types of crimes each gender is more likely to commit. Men generally commit acts of fraud, theft, and manipulation at similar rates, whereas women typically participate in crimes associated with corruption. However, things typically change when women are involved in a mixed-sex criminal network, as their rates in participation of fraud, theft, and manipulation increase by close to 20%. Out of 10,000+ documents, there were only 56 (0.8%) all-female criminal networks, confirming the current academic theory that women either act alone or more predominantly in mixed-sex groups, likely in follower roles as outlined in the work of Benson & Gottschalk. In our study, 24.5% of crimes were committed by a mixed-sex group, which is remarkably consistent with the 22% mixed-sex white-collar crime rate evaluated by Benson & Gottschalk.

Nonetheless, our results are consistently similar with the findings of Benson & Gottschalk, and Steffensmeier et al during coinciding timespans, but a new trend appears in the years after these studies were published. Crimes committed by men, both as individuals and as part of a group have been decreasing consistently over time. Furthermore, crimes committed by women have remained remarkably consistent despite an increased opportunity to participate on executive boards in American corporations. The uptick of women on executive boards over the last 10 years has added a diversity to the structure of American executive leadership, and the results on the crime rate are astounding. We believe the impact of gender on white-collar crime to be a part of a greater scheme of how the diversity of its people is one of the best internal measures a company can control to reduce the white-collar crime

tendencies that were running rampant in the 1990's and 2000's. The idea that diversity, whether gender-based, race-based, or culturally based, was not studied as a predictor in the studies of Benson & Gottschalk, and Steffensmeier et al. However, given the social trends of the last decade, we know that many companies in America have emphasized diversifying their executive boards, and clearly there is some correlation between increased diversity and decreased white-collar crime rates for all types of financial crime. We have developed this rationale by examining the results of gender-breakdown data of our study from 1995-2020. In the early 2000's most of the executive boards in America were male dominated, with similar ethnic backgrounds. However, as diversity and inclusion has become a focal point for many US-based firms, and for society as a whole, the ethnic and gender make-up of executive boards across America has changed to become more diverse in both gender and ethnicity. This increase in multiculturalism correlates with a wholesale decrease in white-collar crime in recent years, and a narrowing of the gender gap due to much lower rates of white-collar crime among men in America. Further research in the white-collar crime space can begin to explore this convergence of the gender gap in recent years and the consistent decrease in male-dominated white-collar crime since 2011 in order to gain a better understanding of the way that diversity plays a role in reducing white-collar crime.

7. Conclusion

Based on the data gathered and analysed in this study, there is an unequivocal gender gap in white-collar crime in the United States. Indeed, this gender gap is shrinking as women gain a greater opportunity in the corporate labour force, and white-collar crime rates for men and women continue to converge. On an individual basis, men commit more white-collar crimes than females. In group settings, all-male groups have historically committed significantly more white-collar crimes than all-female groups. Overall, men account for over 75% of the names listed in litigation releases from 1995 to 2020. Looking at specific crime types, male individuals and groups of all men are significantly higher than female individuals and fully female groups.

These findings are likely not surprising as most would suggest that the reason for the discrepancy between crimes committed by men and women is due to unequal opportunity in executive positions. If women are underrepresented in positions where they could more easily commit white collar crime than of course they will be underrepresented in the crimes as well. This criticism is reasonable and there does seem to be a trend shown in Figure 9 that women are committing more crimes as time progresses. This potentially mirrors the increase in females in executive positions. As the years progress it seems reasonable that this trend would continue, and the male and female percentage of white-collar crime would start to converge towards 50%.

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9. Appendix

Table A 3 - Benson and Gottschalk Table

	N	Percent
<i>Gender</i>		
Male	307	93.3
Female	22	6.7
<i>Crime Type</i>		
Fraud	151	45.9
Theft	24	7.3
Manipulation	95	28.9
Corruption	59	17.9
<i>Occupational Level</i>		
Top Level (Chariman, CEO)	95	28.9
Middle Level (Lawyer, Investor)	151	45.9
Bottom Level (Accountant, Assistant)	83	25.2
<i>Sector Employed</i>		
Private	304	92.4
Public	25	7.6
<i>Corporate or individual beneficiaries</i>		
Corporate Entity	41	12.5
Individual or individuals	288	87.5
<i>Role in the offense</i>		
Leader	192	58.4
Follower	137	41.6

Table A 4 - Benson & Gottschalk Table

Offense Characteristics	All Male Groups		Mixed Sex Groups		Male Solo Offenders		Female Solo Offenders	
	N	%	N	%	N	%	N	%
Number and % in sample	50	78	14	22	91	93	7	7
<i>Type of offense</i>								
<i>Fraud</i>	18	36	10	71	41	45	3	43
Theft	2	4	1	7	10	11	0	0
Manipulation	15	30	3	21	34	37	4	57
Corruption	15	30	0	0	6	7	0	0
<i>Co-conspirators</i>								
Small group (2-4)	44	88	9	64	n.a.		n.a.	
Medium (5-7)	3	6	4	29	n.a.		n.a.	
Large (8+)	3	6	1	7	n.a.		n.a.	
<i>Beneficiary</i>								
Corporate	8	16	2	14	8	9	0	0
Individual	42	84	12	86	83	91	7	100
<i>Female Leaders</i>								
Yes	n.a.		6	43				
No	n.a.		8	57				