ABSTRACT

Title of Thesis:	CREATING AN AGE-CRIME CURVE FOR EMBEZZLERS
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The age-crime curve is a widely accepted phenomenon regarding criminal trajectories of street criminals; however, questions remain about how well this curve maps onto white collar crimes like embezzlement. This research studies the age patterns for embezzlers, creating an age-embezzlement curve similar to that of the age-crime curve for street crime. Through this research, the question of how certain demographics—specifically age—are related to one's involvement in embezzlement, is studied. As there is little research on this topic and there is no known age-embezzlement curve, this research aimed to fill in that gap in embezzlement-age literature. The study contained a sample of 79 convicted embezzlers across the United States and used their originating case date to identify when they were convicted and cross-referenced that with public records providing their current ages and/or dates of birth to determine their ages when convicted. Previous research has demonstrated that younger employees are more likely to commit embezzlement when compared to their older counterparts; this study confirmed that prior research and also created an age-crime curve denoting the age of embezzlers, with peaks from

ages 24 to 28 years old and 44 to 48 years old. This research also found that this sample had a median age of 46 years old and a mode age of 48 years old. Comparisons between male and female cases revealed that female embezzlers are more likely to embezzle at younger ages than male offenders. Age crime curves are important for the study of criminal tendencies as they make the information easy to understand, comprehend, and conveyable to a wider audience (i. e. the public); therefore, it is important to create an age-crime curve for embezzlers and other white collar criminals. Implications of this research revolve around the education received in the business world, whether that be in MBA programs or in the workforce, and how those educational opportunities should focus on the impacts and costs of embezzling to deter employees from committing these crimes.

CREATING AN AGE-CRIME CURVE FOR EMBEZZLERS

by

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Chapter 1: Introduction

Although white collar crime by definition— "a crime committed by a person of high social status and respectability in the course of his occupation" —is nonviolent, it has detrimental effects on society as a whole (Brooks 1949). The financial impact of white collar crime is its most notable aspect. The costs of white collar crime far exceed those of typical street crime. For instance, in the United States alone, white collar crime accounts for anywhere between $426 billion and $1.7 trillion lost annually, which impacts the economy as a whole (Flynn 2022). In contrast, typical street crime, which garners more scholarly and political attention, costs the American public about 1/19th the amount lost to white collar crime per year (Kim 2022). White collar crime affects the economy in a way that ordinary street crime does not, with a far-reaching impact on the general public (Moore and Mills 1990).

Embezzlement—the misappropriation of funds by someone to whom those funds have been entrusted—is one of the most common types of white collar offending (Hayes 2022). Embezzlement is a crime of opportunity, meaning that not every employee of a company has the ability to embezzle; only those entrusted with funds are capable of committing this crime (Hayes 2022). Some examples of this include chief officers (such as CEOs, CFOs, or COOs) stealing funds from their companies, bank tellers skimming money from clients' cash deposits, secretaries or salespeople misusing their company's credit cards for personal gain, or certified public accountants skimming money from clients and illegitimately placing that money in their records as a purchase or payment. Embezzlement is a crime that affects 95 percent of all businesses in the United States with an estimated 75 percent of all employees with the ability to embezzle having committed embezzlement (Safeatlast 2022). Embezzlement is a prevalent issue

in society that affects the economy—and therefore society as a whole—in a way that traditional street crime does not.

Despite its prevalence in society and its impact on the United States from an economic standpoint, the Federal Bureau of Investigation's Uniform Crime Report (UCR) does not include white collar crime in its statistics (FBI 2022). The UCR's omission of this information downplays white collar crime as an issue and therefore diminishes the perception of its impact despite the $1.7 trillion loss that the United States economy faces annually.

Prior literature explores how age may affect an individual's likelihood of committing crimes, such as works that provide evidence for the age-crime curve (Moss 2016). According to an article by Shulman, Steinberg, and Piquero (2013), the age-crime curve is "the observation that criminal behavior increases in adolescence and decreases in adulthood." The notion of the age-crime curve was theorized by Michael Gottfredson in Travis Hirschi 1989. However, despite the age-crime curve's prevalence throughout criminological research as a whole, its application is to street criminals rather than white collar criminals. Although Gottfredson and Hirschi intended their general theory of crime to apply to all crime types, the age-crime curve predicts a trend which may not be true of white collar offenders because the opportunity to commit white collar crime usually emerges with later age and advanced social status.

The age-crime curve itself—the one referring to street crime—is used by the criminological research community as the basis for many different studies and theories of crime; there is no such fact or agreed-upon curve for white collar criminals (van Onna, van der Geest, Huisman, and Denkers 2014). While there have been multiple studies researching the correlation between an offender's age and their involvement in white collar crime, there is not a consensus regarding the age distribution of offenders, let alone an age-embezzlement curve (Park, Lee,

Chun 2017; van Onna, van der Geest, Huisman, and Denkers 2014). There have been attempts to adapt the widely accepted age-crime curve to fit criminals that would be outliers to this traditional street crime research: white collar criminals (Gottfredson and Hirschi 1989). Given these age differences in patterns of street crime versus white collar crime, the literature has turned to age as a key variable in better understanding white collar crime (Gottfredson and Hirschi 1989). More recent research looks to create an age-crime curve for white collar criminals as it will differ from the typical age-crime curve that focuses on street crime.

There has also been an influx in embezzlement—a subcategory of white collar crime—literature in which researchers are examining embezzlers' ages to determine similarities between those who embezzle (Park, Lee, Chun 2017). This research focuses on one's demographics such as sex and age to determine if there are any similarities or differences between embezzlers when it comes to their demographic characteristics (Benson et al. 2021; Daly 1989). The research explores the differences between male and female embezzlers' ages. This aspect allows the findings to differentiate between possible gender disparities in white collar criminal behavior.

Considering the high cost of embezzlement, lack of counting in official statistics, and differences in theory and correlation of crime, the public is often uninformed or misinformed about the impact of this type of crime, which affects a greater number of people in the United States annually than street crime. This lack of information allows these offenders to be less conspicuous than their street crime counterparts, which may also impact the focus of educational programs. This research aims to address that problem and pave the way for changes in the types of education actors in the business world receive and how a change in this type of education could possibly lead to a decline in the total amount of embezzlement and money lost per year in the United States' economy.

Due to the lack of literature specifically related to the correlation between embezzlement and one's age, the research conducted in this study is aimed at filling in that gap. This research creates an age-embezzlement curve for a random sample of embezzlement cases drawn from Public Access to Court Electronic Records (PACER), including differences between embezzlers' stated genders. This research combines the criminological studies of the factor one's age plays in their criminality and the age-crime curve outliers of white-collar crime, specifically embezzlement, creating a curve that demonstrates the relationship between one's age and their involvement in embezzlement and whether age affects one's white collar criminality.

This research is conducted by identifying convicted embezzlers through a search on Google Scholar's Case Law function and then inputting those embezzlers' names into an online search of court records regarding their identified cases. After confirming that the individual cases match with those found on Google Scholar's Case Law function, further research was done using public records to determine the ages of the individual offenders. A sample size of 79 individuals was identified with confirmed information regarding their ages and gender identities. This sample was then used to create three age-embezzlement curves: one overarching curve indicating the trends for every individual involved in the study, one curve for male-identifying individuals, and one curve for female-identifying individuals. The Pearson's Correlation Coefficient was then calculated for each curve, along with their median and mode ages.

This research paper will address the previous literature regarding similar topics and the theoretical framework of this study. It will then explain the methodology of the research, summarize the research findings themselves (including figures demonstrating the curves and relationships between one's age and the counts of embezzlement in the sample), provide an

analysis of the findings and discuss future implications of the research, and then conclude with a summary of the research as a whole.

Chapter 2: Literature Review

Age-Crime Curve

The age-crime curve is the criminological notion that one's age is directly correlated to their criminality—one's propensity to commit crime (Moss 2016). The theory of an age-crime curve has become so widespread that it has grown into one of the dominant theories in criminological research and has led some researchers to claim that the importance of one's age will replace the importance of one's social status as the "master variable" in theories of crime (Wikström 1990).

The age-crime curve generally refers to street crime and represents that in typical street crime, one's criminality "peaks during mid to late adolescence" and then rapidly declines as one's brain matures with age (Moss 2016). Numerous studies have shown that the peak age range of criminal behavior is between the ages of 15 to 17 years old (Wikström 1990). This is also an important factor when it comes to the prevalence of co-offending, which is seen as having a correlation with one's age. Given that co-offending is a major form of criminal activity by juveniles as they are more susceptible to peer pressure than more physically and mentally mature individuals, this association with age can lead to an explanation of their criminal behavior being tied to their desire to fit in with their peers (Stolzenberg and D'Alessio 2008).

The age-crime curve theory has been relatively consistent since Gottfredson and Hirschi's initial study stating its relevance and has critically informed life-course criminology, which further explores the relationship between age and criminality beyond the curve (Gottfredson and Hirschi 1989). Terrie Moffitt used a developmental theory of crime to split youth offenders into two categories: adolescence-limited offenders and life-course-persistent offenders (Leaw et al. 2015). Wolfgang, Figlio, and Sellin—similarly to Moffitt—used the age-

crime curve as a basis for their theories of crime in which they noted that the vast minority of subjects in their study were responsible for over half the offending committed by the cohort they were researching (Cullen and Wilcox 2012). These are just two examples—of many—of how the age-crime curve has been used by criminologists to inform their own research.

Gottfredson and Hirschi intended their General Theory of Crime—the overarching theory that includes the age-crime curve—to encompass crime as a whole; however, there are variations in age that are unaccounted for across different specific offenses (Wilkström 1990). For example, violent crimes tend to have later peaks than property crimes, which is explained by Gottfredson and Hirschi as "an effect of the fact that the seriousness of violence is age related, unlike the seriousness of property offending" (Wikström 1990). This age-crime curve does not account for white collar criminals, who need to be of a certain social status and occupational position to commit the majority of their crimes. Because of this difference in requirements regarding offenders' social statuses between white collar and street crime offenders, the traditional age-crime curve denoting trends in street crime is thought by modern researchers to differ from a theoretical age-crime curve for white collar offenders; however, researchers have not created an agreed-upon curve for these types of crimes. Because of the "requirements" needed to be a white collar criminal—high social and professional status—typical white collar criminals would be outliers on the traditional age-crime curve that mainly focuses on adolescents and people in young adulthood (Wilkström 1990).

At this point, the age-crime curve is considered to be a brute fact by criminologists as its distribution of offenses seems to exist for a wide variety of people, in many places, and at different historical times. White collar crimes—specifically embezzlement—can be seen as

outliers on this curve, making them an area that has to be researched to help explain this disparity.

Embezzlement

Embezzlement is one of the most prominent white collar crimes and affects 95 percent of all businesses in the United States, thereby impacting all of those that work in the affected businesses (Safetatlast 2022). Additionally, it is estimated that 75 percent of employees with the ability or opportunity to embezzle have committed embezzlement at some point in their professional careers (Safeatlast 2022). Given the prevalence of embezzlement in the United States and its effects on the economy as well as the majority of businesses in the country, it has been a widely studied topic for white collar criminologists.

The study of embezzlement—the subcategory of white collar crime that involves the misappropriation of funds by an employee entrusted with those funds—includes a focus on the types of people that typically embezzle and their shared characteristics. There are two main focal points of this research on embezzlers' joint characteristics that affect this current study: their ages and their gender identities. These characteristics have been studied to find comparisons and patterns regarding embezzlers' demographic characteristics. Based on literature, these two factors are sometimes linked, with women committing embezzlement at younger ages than their male counterparts due possibly to men embezzling while in managerial positions and women embezzling at earlier points in their careers (Daly 1989). Daly (1989) contends that this is due in part to gender disparities in the workplace and that women are often not given the same opportunities as their male counterparts to work in these managerial positions, leading to differences in their offenses.

Daly (1989) examined the gender disparities of these criminals and how male and female offenders differ in their professional characteristics. Her research found that there was a positive correlation between the amount of women committing this subset of white collar crime and non-whites committing this crime: both were committing embezzlement at lesser rates than their male and white counterparts, with white males committing the highest rates of embezzlement. She also found that a larger percentage of men in managerial positions commit embezzlement than women in those same positions. Men tend to "exclude women from upperworld crime groups" which leads to these disparities (Daly 1989). This goes hand-in-hand with the notion that "sex segregation in the labor market or within work organizations is the basis for [the] assertion that the female share of occupational crime […is] low" (Daly 1989). This discrimination in the workplace explains some of these differences between male and female offenders when it comes to embezzlement and other white collar crimes. Through conducting case studies on multiple women who committed white collar crime, Dodge (n.d.) challenged masculine theory in white collar crime. She found that "embezzlement represents an equal opportunity crime and overall rates for women tend to be slightly higher than men" and that female bank embezzlers, when compared to their male counterparts, tend to be "younger, less educated, reported lower incomes, and acted alone" (Dodge n.d.). However, Dodge notes that, when given the same opportunities as men, women can embezzle in comparable ways, meaning in similar amounts and with similar frequency.

The last subset of characteristics addressed in this research on embezzlers is their age and how that plays a role in their white collar criminality.

Age-Embezzlement

Age-embezzlement literature attempts to identify trends in the demographics of embezzlers as these trends may help researchers to understand more about those who embezzle (Park, Lee, Chun 2017). Specifically, researchers in this field of literature try to blend the age-crime curve with embezzlement literature to find comparisons between the two types of research.

The first prominent perspective in white collar-age research was that of Gottfredson and Hirschi (1989) where they assumed their General Theory of Crime also applies to white collar criminals. They noted that this was indeed the case, stating that the age distribution for white collar crime follows the same curve as that of street crime, except that it starts at a later age. They assert the age-crime curve is consistent, arguing that there is a fundamental connection between crime itself and the characteristics of those offending, such as age. Thus, their hypothetical age-white collar crime curve largely mirrored that of the traditional age-crime curve that focuses on street crime.

However, recent literature suggests that this may not be the case. Van Onna and colleagues (2014) researched white collar criminals and how their ages relate to their criminality. They found that "two low-frequency offender groups, totaling 78 percent, are characterized by their adult onset" and "two high-frequency offender groups, totaling 22 percent, are characterized by their adolescent onset" (van Onna, van der Geest, Huisman, and Denkers 2014). While the majority of these criminals showed a tendency to initiate their criminal activity in adulthood, roughly one quarter of them had already shown criminal tendencies in their youth, which challenged Gottfredson and Hirschi's idea that the typical age-crime curve relates to white collar crime in the sense that it shows the same patterns starting later in one's life.

Other studies that seem to contradict Gottfredson and Hirschi's idea focus more on the nature of white collar offenders' criminal trajectories once these criminals have initiated their white collar criminal activities, rather than focusing on onset (Park, Lee, Chun 2017). Given that embezzlement is one of the most common forms of white collar crime, it has been the focus of many studies regarding the correlation between one's white collar criminality and their age. Park, Lee, and Chun (2017) examined the relationship between embezzlers and their ages when they committed embezzlement. Their research claims that although there is a large age range of embezzlers in their study—from ages 31 to 80 years old—embezzlers tend to be in the younger 40 percent of that age range.

In an attempt to uncover why younger managers tend to embezzle, McCabe and colleagues (2006) researched graduate schools to uncover if there were any patterns in how business students act as opposed to non-business students. McCabe and colleagues' research studied graduate students and how likely they were to cheat on exams depending on which graduate program they were in: business or non-business. Their results found that graduate business students tend to cheat more than non-business students at the same universities, implying that there is either a culture of doing whatever it takes to get ahead in business school that does not exist for other branches of schooling or that the business world attracts those who are more cut-throat than other career fields. They also found that perceived cheating had the largest effect on these students' behaviors, once again implying some sort of correlation between the business world and the competitive need to get ahead.

Age-embezzlement literature, while informative in finding patterns between the ages of embezzlers, is lacking in the sense that there is no concrete age-crime curve created for this subset of white collar crime. Despite there being numerous studies on this topic, there is no

fundamentally accepted age-embezzlement curve like Gottfredson and Hirschi's age-street crime curve. This may be a result of more modern researchers finding different results than what Gottfredson and Hirschi initially stated about an age-white collar crime curve; nonetheless, there is a gap in this literature as no such curve has been widely accepted by the criminology research community. Having such a curve can lead to the acceptance and acknowledgment of embezzlement as a criminological issue for the United States public. Acknowledging this issue can have educational implications which could help to reduce the amount of embezzlers in the workforce and therefore aid the economy and all those affected by it. Creating this curve could also lead to future studies on the same topic, further assessing the robustness of the findings of the current study, providing better understanding of the prevalence of embezzlement and other white collar crimes.

Summary

Given that the theory that one's criminality is often correlated with their age, it is thought that this could also be the case with white collar criminals. However, the typical age-crime curve, which was built on the basis of street offenses, may not properly reflect white collar crime. Because the traditional age-crime curve peaks in late adolescence and early adulthood, most if not all embezzlers would be outliers on this curve since they are not able to commit this level of crime until they well surpass the average age of street criminals as depicted on the age-crime curve. By combining life-course criminology literature with embezzlement literature, age-embezzlement literature highlights the empirical need for studies to examine how one's age relates to their involvement in white collar crimes, particularly the common crime of

embezzlement, rather than only considering the relationship between age and typical street crimes.

While creating an age-embezzlement curve is important for filling in the theoretical gaps in this research, it also has educational implications that can possibly account for a decline in embezzlement in the workforce along with increased acknowledgment of the prevalence of this crime type, which would both be beneficial for the economy and citizenry of the United States.

Chapter 3: Data Collection and Methods

Data Collection

Data for this study come from two different sources. First, cases are identified using Google Scholar's case law search function. Google Scholar's case law function is a searchable database that includes court cases from appellate and state supreme courts since 1950; federal district, appellate, tax, and bankruptcy courts since 1923; and the United States Supreme Court since 1791 (Barnes 2022). Sample selection involved quasi-random selection of every third record appearing in the Google Scholar's case law search. This was repeated until reaching 100 embezzlement cases. The case dockets were then located using PACER—an electronic public access service that contains case filings and docket information from the U. S. federal courts. PACER is a publicly available data source with access to federal criminal and civil court records. Information pertaining to all parties involved as well as outcomes and charges is available on this service. The cases in PACER can be linked to individual defendants and therefore can be used to acquire relevant demographic information about those defendants, such as age and sex. This research utilizes PACER for the purpose of searching these dockets and locating relevant demographic information regarding the defendants for each case.

The dataset for this study is comprised of 121 embezzlement cases: 100 cases were directly identified through Google Scholar and 21 additional cases were identified through co-defendants as derivative cases. Cases were selected by choosing every third case that appeared as a result of searching embezzlement convictions between the years 2010 and 2020. This 10-year period was chosen to ensure that the data was up-to-date and recent while providing sufficient data points for the analysis to be statistically significant. From 2010 to 2020, there were approximately 1,000 embezzlement cases that ended in a conviction available through Google

Scholar's case law search function. It is important to note that the cases chosen did not necessarily start or end during this 10-year period, but rather a court hearing was held in the case during that time frame. Given the hearing, trial, and sentencing process, I chose to include all cases where a hearing occurred during the 2010 to 2020 range to garner a larger sample size and still allow for analysis of full records of the case filings. By only requiring a hearing to have occurred during the 2010 to 2020 range allowed the research to focus on full records of the case filings, thereby providing additional data to address the intended focus of the research. To account for this, all calculations regarding a defendant's age were made by using the case's original filing date rather than the date supplied by Google Scholar.

Two important parameters placed on this search, in addition to the 10-year period, were that the case ended in a conviction—whether at trial or the appellate court—and that the cases were conducted in the United States. The parameter that these cases resulted in convictions was necessary as it ensured that embezzlement had been found and that the cases chosen for this study were not simply false accusations that resulted in defendants' findings of not guilty. These cases had to be complete in order to ensure the focus on convicted embezzlers, as findings of not guilty could possibly skew the data in the sense that people who are not found to be embezzlers would be inappropriately included in the dataset. The geographic parameter is also necessary to ensure that it was an area large enough to be diverse, but small enough to be generalizable to a chosen population; in this case, that chosen population is the United States. The diversity aspect of this criterion is important given that ages of embezzlers will be controlled based on one's race and gender identity after all demographic information has been collected on each datapoint. Due to not being able to confirm all of the necessary information for 42 of the cases, the final dataset consisted of 79 randomly selected embezzlement cases.

Methods

Two demographic characteristics were studied in this research: age and sex. To calculate for one's age, public records—from various websites and docket information—were used to determine defendants' dates of birth. In some cases, the dockets themselves provided the necessary information on each defendant. PACER was used for this portion as well as it gives the user full access to public docket entries and party information. However, in cases where docket information was not available regarding the defendants' ages, other public records were used in an attempt to find this information. Approximately 75-85 percent of the cases researched thus far have not had defendants' ages readily available in the docket information. Therefore, other public records were used to obtain that information, such as college basketball rosters, news articles, and feature stories about some of the defendants. These records, however, may have been slightly less accurate than the PACER records. This is because, rather than being given the direct information about a particular defendant, case information was used in an attempt to locate that person nationwide and assign an age to them. To do this, identifying information was used—such as the city in which they resided, the year they graduated college, or a year they played a collegiate sport—to narrow down the search on these subjects and find them using alternative methods, such as searching public websites through Google. For those in which age could not be fully confirmed, their data points were left off the data sample to ensure accuracy among the dataset. Once a date of birth was assigned to each of the defendants—where applicable—the date of their initial hearing was used to determine their age at the time they were first charged with the crime of embezzlement. This was uniformly done throughout the research so that all information was gathered in the same method and each age was calculated by the same means.

A similar technique was used to identify the sex of the embezzlers; this information was available on all of their dockets, making this the most complete measurement taken via PACER without having to use other outside public record websites. After defendants' sexes were accounted for, they were split into two groups: male and female. To create the age-embezzlement curves controlling for one's sex, their ages were split up by identified sex and then those divided age groups were used on the x-axis of the curve with the y-axis identifying their counts of embezzlement.

Variables

Independent Variables

The main independent variable in the research was one's age: how old they were when they were caught committing embezzlement.

Measuring age using originating case date gives a more accurate representation of these offenders' ages than if the study used their conviction date as using one's conviction date would be using data that is much further removed from the age at which the behavior occurred. Therefore, using the originating case date is a stronger point at which to capture one's age at the time of their criminal behavior.

The median age of all the offenders in the study is 46 years old, with the mode being 48 years old. There is a bimodal distribution with peaks from ages 24 to 28 years old and 44 to 48 years old.

The other independent variable in this study was one's sex. Counts of embezzlement given one's gender identity (whether they identify as male or female) is studied to differentiate between those two gender identities and to test for possible disparities between them.
Of the 79 data points in the study, roughly 25 percent were female (20 of the 79 cases) with 75 percent of the offenders being male (59 of the 79 cases) .

The median age of the male offenders in the study is 47 years old, with the mode being 49 years old. There is a bimodal distribution with peaks from ages 24 to 28 years old and 49 to 53 years old.

The median age of the female offenders in the study is 39 years old, with the modes being 36, 39, 47, 53, 61, and 65 years old. There is a polymodal distribution with peaks from ages 24 to 28 years old, 34 to 38 years old, and 44 to 48 years old.

Dependent Variables

The dependent variable in the research is the counts of embezzlement: how many people in my dataset embezzled given their age ranges.

Analytic Strategy

Regarding the research question examined in this study—how certain demographics, specifically age, can affect one's involvement in embezzlement—the creation of an age-embezzlement curve helps to understand how people's ages are related to their white collar criminality. The data found in this study, and the age-embezzlement curve that it creates, allows for this better understanding.

The data was evaluated to see if there was a linear correlation between the studied variables. If there was such a correlation, positive or negative, it would indicate that as one variable increases or decreases, the other does the same.

Pearson's Correlation Coefficient is used because the two variables studied—counts of embezzlement given age—are both continuous. Pearson's Correlation Coefficient is the measure of the correlation between two variables: in this case, one's age and their involvement in embezzlement. The Correlation Coefficient ranges from -1.0 to +1.0, and both denote a strong correlation between the variables, meaning that as one gets older, they are either more likely to embezzle than when younger (+1.0) or meaning that as one gets older, they are less likely to embezzle than when younger (-1.0).

Each of the histograms (Figures 1 to 3) uses five-year buckets to capture the age ranges as there was not an embezzlement case found for every age in the age range of 18 to 103. To create these curves, a point was placed at the top of each peak and valley in each histogram and those points were connected via a curved line.

Chapter 4: Findings/Results

The expected result for the Pearson's Correlation Coefficient is that it would show a weak, negative correlation for all three curves as one's involvement in embezzlement does not exponentially increase or decrease as one's age increases—in other words, that the peak age for embezzlement is in the middle of the curve rather than at the ends. This is exactly what happened. The lower value of the correlation denotes that there is a small statistically significant relationship between one's age and their involvement in embezzlement.

The important factor in this correlation regards its positive/negative value. Given that the overarching Pearson's Correlation Coefficient for all three curves is negative, it is implied that there is a slight pattern shown in the data that white collar criminals' involvement in embezzlement peaks at a younger age rather than an older one, although ever so slightly. This relationship is seen in both the male and female correlations as well; however, it is stronger for the female correlation than the male one.

Table 1. Pearson's Correlation Coefficients for the Independent Variables

Variable	**Pearson's Correlation Coefficient (*r*)**
All	-0.167
Male	-0.080
Female	-0.126

For the figures in the study, there are three age-embezzlement curves: one denoting the age curve for all of the defendants, one denoting the age curve for male-identifying defendants, and one denoting the age curve for female-identifying defendants:

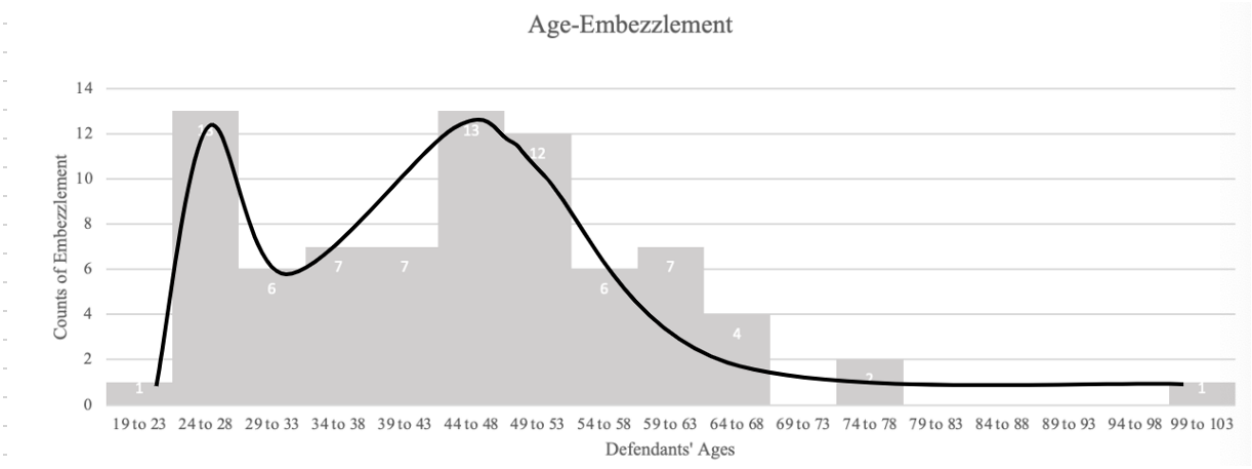

Figure 1. Age-Embezzlement Curve for All Defendants

Figure 1 presents the empirical results for the data as a whole and shows the overarching age-embezzlement curve. This graph denotes the defendants' ages on the x-axis and the counts of embezzlement per age group on the y-axis. This is a bimodal distribution with peaks from ages 24 to 28 years old and ages 44 to 48 years old. The median age for this sample is 46 years old with the mode age being 48 years old. This bimodal distribution for the overall defendants differs from that of the age-crime curve for street crime as the age-street crime curve has one peak near the beginning of the distribution. The average age of this sample, which had a range of 84 years, was $\overline{x}$ = 45.228 years old.

The Pearson's Correlation Coefficient for the overall data was r = -0.167. This weak correlation signifies that there is not an increase or decrease in one's involvement in embezzlement as they age, but rather that there is a slight increase as they grow older followed by a decrease as they "age-out" of their criminal involvement, similar to that of the age-crime curve for street crime. This coefficient was negative, meaning that people's involvement in embezzlement is on the younger half of this curve.

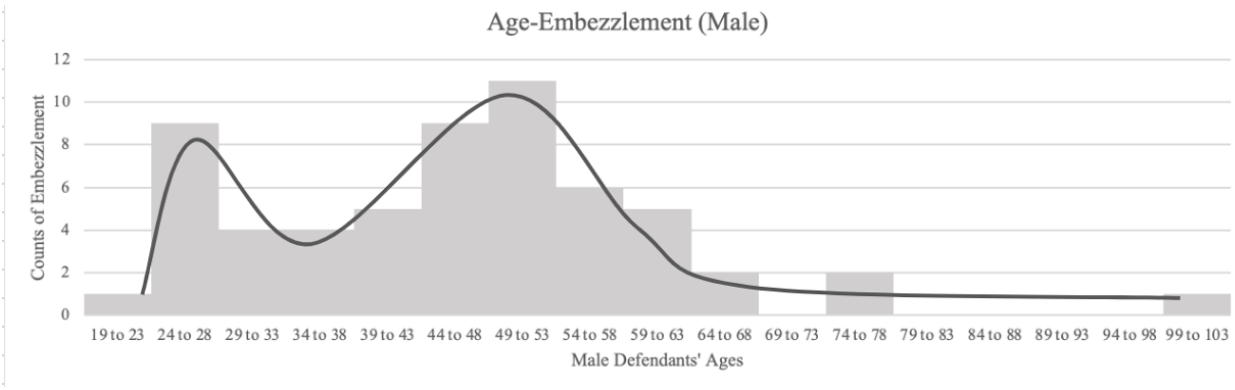

Figure 2. Age-Embezzlement Curve for Male Defendants

Figure 2 reports the empirical results and the age-embezzlement curve for the data on male members of the study. This—similar to Figure 1—is a bimodal distribution; however, this distribution's peaks are at 24 to 28 years old and 49 to 53 years old, with the second peak being slightly older than that demonstrated in Figure 1. The median age for this subset of the data is 47 years old whereas its mode is at 49 years old. The range of this sample was also 84 years, but the average age was $\overline{x}$ = 46.220 years old.

The Pearson's Correlation Coefficient for male defendants was r = -0.080. This is a weaker correlation than that of the overall data; however, it similarly signifies that one's involvement in embezzlement is not exponentially related to their age in the sense that as one gets older, they either embezzle more or less than they did when they were younger. This value is also negative, which shows that the offenders' involvement in embezzlement peaks at the younger portion of this data.

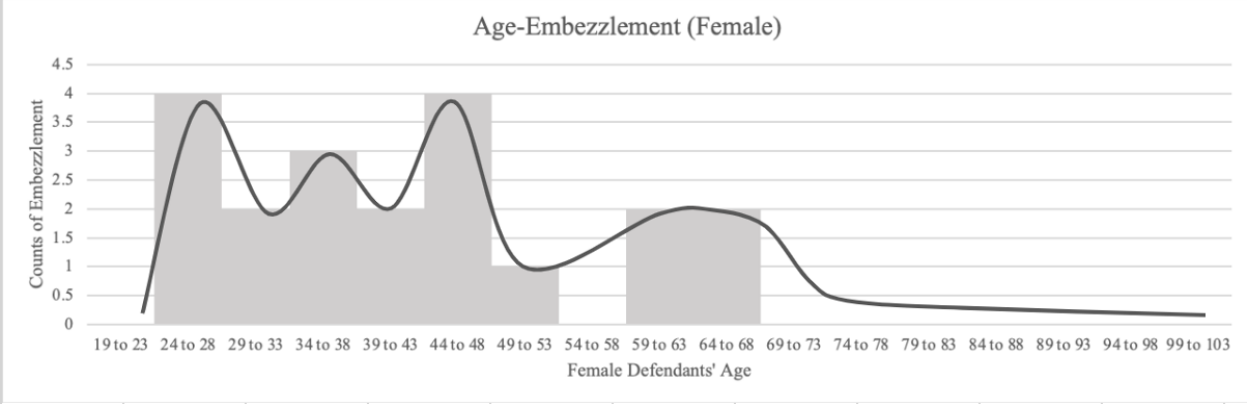

Figure 3. Age-Embezzlement Curve for Female Defendants

Figure 3 shows the empirical results and age-embezzlement curve for the data on female members of the study. This—unlike both Figure 1 and Figure 2—is a trimodal distribution, with peaks at ages 24 to 28 years old, 34 to 38 years old, and 44 to 48 years old, demonstrating a slightly younger age range than its male counterpart. Representing the same trend, the median age of this subset of data is 39 years old; however, it has many modes of 36, 39, 47, 53, 61, and 65 years old. The most important point in this data is the youthfulness of these offenders. The median age for female embezzlers was 10 years younger than their male counterparts. The average age for this sample, with a much smaller range of 43 years, is $\overline{x}$ = 42.300 years old.

The Pearson's Correlation Coefficient for the female data points in this study was r = -0.126. Similar to the correlation coefficient for the male defendants, this correlation is weaker than that for the overarching data; however, it is stronger than that for the male defendants. This implies that one's involvement in embezzlement does not exponentially increase or decrease as they age. Similar to both the overarching data and the data for male defendants, the correlation coefficient for female defendants obtained a negative value, meaning that they tend to be on the younger half of this spectrum.

This study found that there is a bimodal distribution for the age-embezzlement curve that denotes all of the offenders studied (Figure 1) with a median age of 46 years old and a mode age of 48 years old. It also is found that the distribution for male defendants (Figure 2) shows the same type of distribution, but with median and mode ages both being slightly higher than the overarching data, which contrasts with that of female offenders shown in Figure 3, which have a much lower median age of offending with a wider range of modes, ranging from mid-30s to mid-60s.

Chapter 5: Discussion

This study was aimed at identifying commonalities between the demographic characteristics of embezzlers, mainly their ages and identified genders. Given that there is a widely accepted age-crime curve for street crime that denotes the importance of targeting programs toward younger individuals as they are the ones more likely to commit those street crimes, the purpose of this research was to create such a curve for white collar offenders, in particular, embezzlers. In this study it was found that the age-embezzlement curve created from the collected sample data indicated a bimodal distribution with a median age of 46 years old and a mode age of 48 years old. For male offenders, there was also a bimodal distribution with a median age of 47 years old and a mode age of 49 years old. In contrast, for female offenders, there was a polymodal distribution with a median age of 39 years old and many different modes ranging from 36 years old to 65 years old.

These results resemble those found from previous studies on the same or similar topics: the notion that white collar offenders, specifically embezzlers, are more likely to commit embezzlement on the younger half of the corporate age spectrum and that the ages of offenders differ depending on one's identified gender.

While these results were generally expected, especially regarding the younger offenders involved in this study, the fact that female offenders were much younger on average than their male counterparts was something that was not expected. Given that the male median was slightly above the overarching median, it was expected that the female median would then be lower than the overarching one; however, the female numbers being significantly lower came as a slight surprise. This could be explained by the lack of sufficient data points regarding female offenders: of the 79 individuals used for this study, only 20 of them identified as female. Given that there

was roughly one-third the amount of females in the study compared to males, this may be the cause for more variation in the female data points; more female data points would allow for less variation in this subsection of the sample. It is assumed that if there were more cases of female-identifying offenders in this study, their median would be closer in value to the overarching median of the study, however it would still remain lower than that of the males. It is recommended that further research be conducted to see if there truly is that large of a gap between the ages of male and female embezzlers or if that was simply due to the fact that there were exponentially fewer women in this study than men.

There were two main limitations in this study that could possibly be addressed in future research on this same topic: the limited number of female individuals in the study and a relatively small number of individuals in the total sample. Both of these limitations are related; 79 cases is a generally small sample size which is then amplified when breaking this data apart by gender. As stated above, the limited number of female individuals in the study may account for the major differences in the ages of male and female offenders and, if there was more data on female offenders in this study, the gap in those differences may have been reduced. Although results vary, some articles show that women embezzle more than men (Jessup 2014). If this is the case, then this study would be more generalizable if there were more female data points than male data points. However, given that there is an underrepresentation of female embezzlers in this study, future studies should use a stratified sampling method to obtain accurate gender proportions in a study similar to this one to make the information found more reliable and universal.

Regarding the second limitation, the number of individuals in the sample, 79, was less than what was initially intended, 121. A greater number of individuals studied would make these

findings more generalizable and may have provided for slightly different data or a slightly different distribution. The larger the sample size, the more likely the data will show findings closer to the true distribution; therefore, more data points would lead to this research becoming more generalizable. Given that around one-third of the initially intended dataset was omitted due to a lack of confidence in those cases and identifying those individuals, the current dataset seems to be slightly thin. However, this does not mean that the findings are not still generalizable; this just means that if there were more data points, the final calculations and data would be even more generalizable than they currently are.

While this is not a limitation to the study, it is important to note that the average age of individuals found in this study was the age at which they were charged with committing embezzlement, it is not the age at which they first started to commit any type of crime. Because of this, it is likely that the offending ages are, in reality, slightly lower than what is recorded in this study.

There are three potential follow-up research studies regarding this study and its limitations: one that includes more female data points, one that includes individuals' race/ethnicity, and one that involves interviews. The importance of obtaining more data points on female individuals in the study has already been addressed, but the follow-up research regarding one's race has not. As is shown in the research findings in this study, there is a difference in ages between male and female offenders. Given previous research regarding white collar crime in general, there may also be differences in the ages of offenders from different ethnic backgrounds and those that identify with different racial groups; for example, a difference between white and non-white white collar offenders has been researched in the past, but there has not been research regarding an age-embezzlement curve for these different demographics (Park, Lee, Chun 2017;

van Onna, van der Geest, Huisman, and Denkers 2014). By conducting a study on these demographics and the possible differences regarding the ages of people who identify with different racial or ethnic groups, one could get a better understanding of how an embezzler's age is affected by their race/ethnicity. Therefore, such a study would lead to interesting results regarding this topic and its implications.

Given that this study solely received information on the embezzlers' ages once they were charged with the crime, there is a possibility these offenders began committing embezzlement earlier in their professional careers than when they were charged. It is important to note that white collar crime has one of the largest dark figures of crime—"the amount of crime that occurs without officials knowing about those crimes"—and therefore there is often missed data in white collar criminological research (Payne 2018). Because of this large dark figure of crime for white collar crimes, it is likely that these offenders started committing embezzlement earlier in their lives than the available data indicates, which would shift this age-embezzlement curve younger than it currently is, possibly even changing the shape of the distribution as well as its spread. Another study on this topic could be conducted by interviewing the offenders and obtaining information regarding the onset of their embezzling activities. This could lead to the age-embezzlement curve created in this study having a younger median or mode and attaining earlier cases of embezzlement and younger ages of offenders.

Age-crime curves are important as they visually show patterns and correlations between one's age and their involvement in crime. These visuals make this information easier to understand and easier to spread to a wider audience (i. e. the public). White collar criminals, due to the nature of their crimes requiring them to be of a certain social and professional status, typically cannot commit these crimes until they are at least 18 years old, meaning that an age-

crime curve for white collar criminals must inherently be different from that of the age-crime curve for street crime. This study found this to be the case. There is a bimodal distribution of counts of embezzlement given one's five year age range, with a median age of 46 years old and a mode age of 48 years old. The theoretical framework, that there is a universally-accepted age-crime curve for street crime but not for white collar criminals, underpins the study. The research shows the differences between the regular age-crime curve, depicting the typical ages of street crime offenders, and its white collar outliers who often begin their criminal careers later in life because they have not yet attained sufficient career positions to be able to commit these offenses. Given the robust spread for the age-crime curve for street crime, this study aimed to create a similar curve for embezzlers to showcase the difference in the offending patterns.

Along with aiming to create an age-embezzlement curve, this research also has implications in the professional world regarding educational practices for both companies and Master's in Business Administration (MBA) programs. With respect to companies' educational practices, these findings suggest that businesses should provide focused education and training that targets younger employees to define embezzlement activities and apprise them of the ramifications and costs of embezzling. This research may also impact MBA programs and how they educate their students. As previous studies have shown, MBA students are more likely to cheat to get ahead of their classmates than other graduate programs at their same universities (McCabe et al, 2006). To theoretically reduce the number of younger individuals committing embezzlement, different mindsets—such as those of cooperation and working as a team as opposed to doing anything possible to get ahead of one's peers—should be implemented into MBA programs. MBA programs should also stress further education on ethics, professional responsibility, and the ramifications of criminal activities in an effort to dissuade this type of

behavior. Both of these approaches could work to reduce the amount of embezzlement that is currently occurring in the United States.

Chapter 6: Conclusion

This study was conducted to determine if there is a relationship between one's age and their white collar criminality, specifically their involvement in embezzlement. Due to the prominence of the age-crime curve for typical street crime and the lack of one for white collar crimes, this study was conducted to fill in that gap in the current research. Embezzlement was the chosen form of white collar crime for this study due to its prevalence in society and the public financial impact in the United States annually. As different types of white collar crime attract different offenders with different characteristics, if a white collar crime other than embezzlement was chosen for this study, the results may have differed.

In this study, it was found that younger employees are more likely to embezzle than their older counterparts and that female embezzlers are, according to their median ages, more likely to be younger than male offenders. These findings are similar to previous research on this topic; however, this study places this data into the form of age-embezzlement curves, which the previous research was lacking. This study paves the way for follow-up research on other demographic information—such as one's race/ethnicity—and how that demographic information can affect one's involvement in embezzlement at younger ages.

The theoretical implications of this research are in its attempt to widen the scope of the age-crime curve to include white collar criminals. This study aims to establish the framework for future studies to fill in this gap in age-embezzlement literature as well as focus on creating an age-crime curve for white collar criminals that can be accepted as fact similar to that of the age-crime curve for street criminals. The policy implications of this research revolve around the educational practices of MBA programs and businesses in helping inform students and future business professionals of the effects of embezzlement as well as the importance of ethics in the

workforce. By addressing these issues earlier in career development, perhaps employees will be deterred from committing embezzlement, which would reduce the amount of white collar crime in the United States and its financial impact on the economy as a whole.

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