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ECONOMIC DETERMINANTS OF CRIME: A TEST OF THE ECONOMIC STRAIN THEORY AND RACIAL IMPLICATIONS

by

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I hereby recognize and pledge to fulfill my responsibilities as defined in the Honor Code and to maintain the integrity of both myself and the College as a whole.

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Table of Contents

CHAPTER 1: INTRODUCTION 1

CHAPTER 2: BACKGROUND 4

CHAPTER 3: DATA ANALYSIS 25

CHAPTER 4: CONCLUSION 49

REFERENCES 51

ABOUT THE AUTHOR 54

List of Tables

TABLE 1: DESCRIPTIVE STATISTICS …… 26

TABLE 2: PREDICTED SIGNS ……
31

TABLE 3: REGRESSION WITH TOTAL CRIME RATE …… 36
AS THE DEPENDENT VARIABLE

TABLE 4: REGRESSION WITH CRIME RATE AGAINST …… 38
PERSONS AS THE DEPENDENT VARIABLE

TABLE 5: REGRESSION WITH CRIME RATE AGAINST …… 40
PROPERTY AS THE DEPENDENT VARIABLE

TABLE 6: REGRESSION WITH CRIME RATE AGAINST …… 42
SOCIETY AS THE DEPENDENT VARIABLE

List of Figures

FIGURE 1: MARGINAL COSTS AND MARGINAL BENEFITS …… 4

FIGURE 2: MODIFIED MARGINAL COSTS AND MARGINAL BENEFITS …… 11

FIGURE 3: MARGINAL COSTS AND MARGINAL BENEFITS FOR BLACK AND WHITE PEOPLE …..…… 23

FIGURE 4: THE LORENZ CURVE AND THE GINI COEFFICIENT …….…… 32

Abstract

This thesis features an analysis of the Economic Strain Theory and the corresponding racial implications. The question of interest focuses on which city-level demographics have the largest effect on crime rates. To answer this inquiry, data from the NIBRS and the US Census Bureaus' American Community Survey was analyzed via multiple regression analyses. Several interaction terms were included to capture the combined effect of the percentage of the population that identifies as Black and several of the economic indicators. Results lead to the conclusion that cities with a high poverty rate, a high percentage of households with single mothers, and households on SNAP have higher crime rates. Conversely, the lack of statistical significance for the interaction terms suggests that race has less to do with crime than generalized economic deprivation. The paper closes by concluding that focusing on providing a baseline economic equality and support will be the most effective way to reduce crime rates.

CHAPTER 1: INTRODUCTION

On May 25th, 2020, a Black man named George Floyd was suffocated to death by three police officers. A few minutes before his murder, a convenience store employee called the police accusing him of purchasing cigarettes with counterfeit money. Once the police arrived, officer Chauvin pinned him to the ground and put his knee on Floyd's neck for eight minutes and 46 seconds until he died. This horrific moment in American history signaled to its people that change needs to occur to prevent this from happening again (Hill et al., 2020).

Racial profiling has plagued and continues to plague this country, leading to a disproportionate number of Black people shot and killed by police. According to NBC's reporter Curtis Bunn, " Black people, who account for 13 percent of the U.S. population, accounted for 27 percent of those fatally shot and killed by police in 2021" (Bunn, 2022). This statistic highlights the needless violence the Black community faces on a daily basis culminating in the relentless cycle of prejudice and negative stereotypes conditioned into every individual from birth. Many of us believe those messages and ideologies passed down for generations but the question remains: Are these assumptions backed by legitimate evidence?

Researchers, economists, and policymakers believe different things since interpretations of data are subject to bias. Unlike news sites that exaggerate the truth for more clout, the Federal Bureau of Investigation (FBI)'s Uniform Crime Reports (UCR) represent the data in a purer form. Their data shows that of all crimes committed in 2017, only 27% of them were by Black people (FBI, 2018). Despite the data coming from the largest law enforcement agencies in the country, people still buy into mass media and racial stereotypes.

Even if people's assumptions hold validity, the government priorities seem to line up not with crime prevention but with the marginal increase in GDP that crime-fighting and repairs

have on the economy. In 2017, scholars estimated that the United States allocated approximately 3.2 percent of GDP to crime-related expenses (Curran, 2021). In stark contrast, the national crime rate only decreased by .2% over the last 20 years (FBI, 2017). Where is America going wrong?

To answer that, this paper builds a succinct model of crime by analyzing the crime rate using the Economic Strain Theory, as well as Racial and city demographics. First proposed by Robert King Merton and Robert C. Merton in 1968, the Economic Strain theory portrays the cycle in which an individual or household experiences economic deprivation followed by a psychological reaction of stress which eventually leads to them committing a crime. Many scholars agree with the theory but also argue that Black people are most impacted by this theory. Therefore, the current study will test the validity of this theory as well as its corresponding racial implications.

The findings from this study serve as a guide for current legislation as well as shed light on the negative stereotypes involving the Black population and crime by introducing other factors that could lead to an increase in criminal activity. For one, the results suggest that the relationship between race and crime is minimal compared to the main effects of the economic indicators introduced in the model. The findings suggest that cities with high levels of poverty tend to have higher crime rates. In parallel, the regressions showed minimal statistical significance when it came to racial elements. This study will present many arguments regarding the role that both the Economic Strain Theory and race play in the variation of crime rates across different cities in America. Even though the results do not follow the initial prediction that race affects crime rates just as much as elements from the Economic Strain Theory, the results

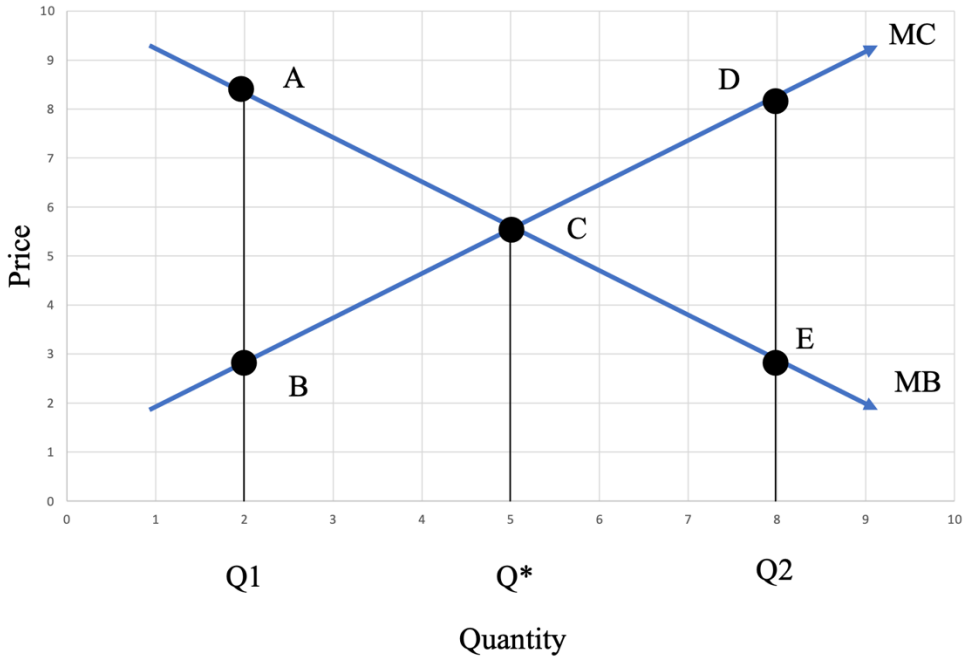
provide the opportunity to dispel the racial stereotypes that lead to the Black profiling problem in this country.

CHAPTER 2: BACKGROUND

Theory

The basis for rational criminal thinking involves a cost-benefit analysis of committing a crime. Just as businesses perform this kind of evaluation when making decisions, everyday people implement this strategy in their day-to-day lives. For individuals, this fundamental model boils down to simple supply and demand. In fact, supply and demand are equivalent to the marginal cost and marginal benefit curves.

Figure 1: Marginal Costs and Marginal Benefits



The marginal benefit of committing a crime resembles that of the downward sloping demand curve. This curve shows the monetary gains associated with committing a crime. The marginal benefit curve illustrates the law of diminishing marginal returns. In other words, each additional crime committed leads to a decrease in marginal benefits a person will receive. On the other hand, the marginal cost curve takes on the shape of the supply curve. Unlike the MB curve, the MC curve demonstrates that each additional crime committed leads to an increase in potential

or actual costs. The point at which the MC and MB curves intersect is called the equilibrium point. This point is denoted by C in Figure 1. It assumes that a rational criminal will commit that level of crime because the marginal costs of the crime equal the marginal benefits.

In terms of the crime application, both individuals and government structures assess associated marginal costs and benefits. Individuals consider the monetary gains (MB) in contrast to the possibility of being caught as well as the probable penalties (MC). The marginal cost to individuals must also be the opportunity cost. If an individual cannot find any good alternative jobs, crime becomes less costly. In terms of the Economic strain theory, the marginal costs or opportunity costs represent the economic deprivation piece while the rewards gained by crime can be denoted by the marginal benefit curve.

Law enforcement, however, deliberates over the benefits of catching that additional criminal versus the time, energy, and resources required for the job. Similarly, government agencies and officials try to find an equilibrium where they find the optimal point to deter criminals while also making a positive impact on the overall GDP. Both must consider their allocated budget for catching these criminals while maximizing social welfare subject to this constraint.

Black History

Ever since the birth of America, People of Color, but specifically Black people, have been discriminated against due to their skin color and pushed towards the outskirts of society. Many of the first African Americans in this country arrived as slaves from their home continent, Africa. It was not until the end of the Civil War in 1865 that Congress passed the 13th Amendment to the US Constitution, abolishing slavery. Shortly after, the 15th Amendment passed, giving men of Color the right to vote. Even after gaining freedom by law, many Black

families struggled to find work, make a living, and take care of their children while facing great prejudice, racism, and violence.

The first major event following the legal end of Slavery occurred after President Rutherford Hayes was elected to office. He reached the Compromise of 1877 when he removed troops from the border between the North and South letting southern states make decisions about the rights of their African American citizens. This gave birth to the Jim Crow era where "thousands of blacks were lynched in racially motivated violence" and their "properties burned or destroyed by racist whites" (Marable & Hilton, 2). During this time, many southern farmers attempted to fight back against this new wave of white terrorism as they formed the Colored Farmers' National Alliance and Cooperative Union in 1888. Although the group ceased to exist after a short period of time, it proved extremely useful in the fight for equal rights in the long run.

From this racial inequality and abuse, the National Association for the Advancement of Colored People (NAACP) took flight, which would eventually lead to the Civil Rights Act of 1964, the Voting Rights Act of 1965, and the Fair Housing Act of 1968. However, progress needed to continue. Between 1952 and 1954, Brown vs. the Board of Education aimed to integrate the school systems leading to the admission of the Little Rock Nine in 1957. A few decades later, however, Barack Obama was elected as the first Black President, signifying a great change in a short period of time.

Although major issues such as slavery and segregation have been greatly improved over the years, the Black community continues to face disproportionate levels of economic, racial, and societal deprivation. According to the US Census Bureau, the Black community experiences the highest poverty rates among approximately 15.9 percent of all racial categories (Bureau, 2022).

Further, the Black community has consistently had the highest unemployment rate (other than Native Indians) almost double that of their white counterparts (Bureau, 2022).

Moreover, as mentioned earlier, the murder of George Floyd brought to light the problem of police brutality and racial profiling within the policing system. Racial profiling occurs when police suspect someone based on stereotypes often revolving around the Black community. This, in turn, creates distrust in the system, making these people feel ignored. This self-perpetual cycle of unjustified arrests and wariness of law enforcement also biases the arrest reports. This leads to the inaccurate conclusions making it seem like crime rates among the Black community are much higher than they actually are.

This brief historical overview captures the injustices that Black people faced and continue to face in our society. Their disproportionate suffering greatly impacts the way they measure the costs and benefits of committing a crime as well as all elements in the Economic Strain theory. With a lower income and higher unemployment, these individuals and families face greater economic and psychological hardships leading to an increased incentive to commit crimes for instrumental gain. They also view law enforcement and other institutions as an enemy rather than helpful resources, creating lower perceived marginal costs of crime.

Literature Review:

A lot of the existing literature attempts to explain why different individuals and groups of people vary in terms of perceived marginal costs and benefits. Understanding the current literature surrounding crime causation not only helps law enforcement understand the criminal rationale but it permits lawmakers and social workers alike to develop prevention policies to stop people before they potentially become criminals. Scholars have attempted to model crime through different disciplines ranging from psychology and sociology to economics. This chapter

analyzes the work performed by previous researchers on this topic. Each subsection builds on the next, painting a picture of crime rate determinants and criminal rationalization.

Economic Theories of Crime

The relationship between the economy and crime rates makes sense intuitively; the worse the economy, the higher the unemployment rate resulting in poverty, homelessness, and eventually crime. Many Economists argue that this pattern exists due to the marginal cost and obstacles of committing a crime being lower than optimal. This section breaks down this simple model of crime starting with the founding theories and ending with some alternative hypotheses.

As portrayed in the previous section, Criminal decision-making boils down to simple cost-benefit analysis. As displayed in Figure 1, the point in which the marginal cost and marginal benefit curves interest denotes the optimal crime level (point C of Figure 1). From a criminal's perspective, they would only commit a crime if the marginal benefits of doing so exceed the marginal costs. In other words, if the probability of being caught, fined, or imprisoned surpasses the possible gains, a rational person may decide not to commit a crime. On the other hand, law enforcement wants the marginal cost to be greater than the marginal benefits in order to deter criminals and, subsequently, lower crime. The issue is that these curves differ on an individual level as each person has their own set of circumstances that may impact their curves.

William Adrian Bonger (1916) formulated one of the founding economic theories of crime. He introduced the idea that economic indicators play a significant role in determining crime. He provides commentary on the psychological effects of economic disparity describing the cycle where people who "do not possess the means of production are forced to sell their labor to those who do" (Bonger, 1916). In return, these aristocrats "force them [poor people] to make the exchange for the mere necessaries of life and work as much as their strength permits"

(Bonger, 1916). People in this situation continue to work long hours performing monotonous tasks while living in poor conditions with the constant "uncertainty of existence" (Bonger, 1916).

One of the most prominent solutions discussed in his paper is to stress the importance of improving social welfare for the community as a whole. Bonger argues that the government should agree upon a singular set of economic policies in order to productively mitigate crime. He also stresses the importance of improving community welfare to ultimately "awaken [...] a strong feeling of altruism" (Bonger, 1916).

Gary Becker (1968), a professor of economics and sociology at the University of Chicago, built on Bonger's (1916) work by using neoclassical economics to formulate policies about optimal enforcement. He aimed to find the optimal quantity of resources and punishment level that will be effective in deterring criminals. Before diving into that question, Becker highlights the undeniable fact that the crime industry makes up a substantial segment of the US's GDP that, at the time, totaled over 4 billion dollars in correctional expenses. He concludes that finding these optimal levels will require minimizing social loss and efficiently distributing resources to do so. Becker also touches on the problem of imprisonment by trying to find a way to minimize the cost to society while maximizing the cost to the offender. In summary, Gary Becker perpetuated the conversation surrounding economic indicators of crime by arguing that a new equilibrium point must be found by reallocating resource.

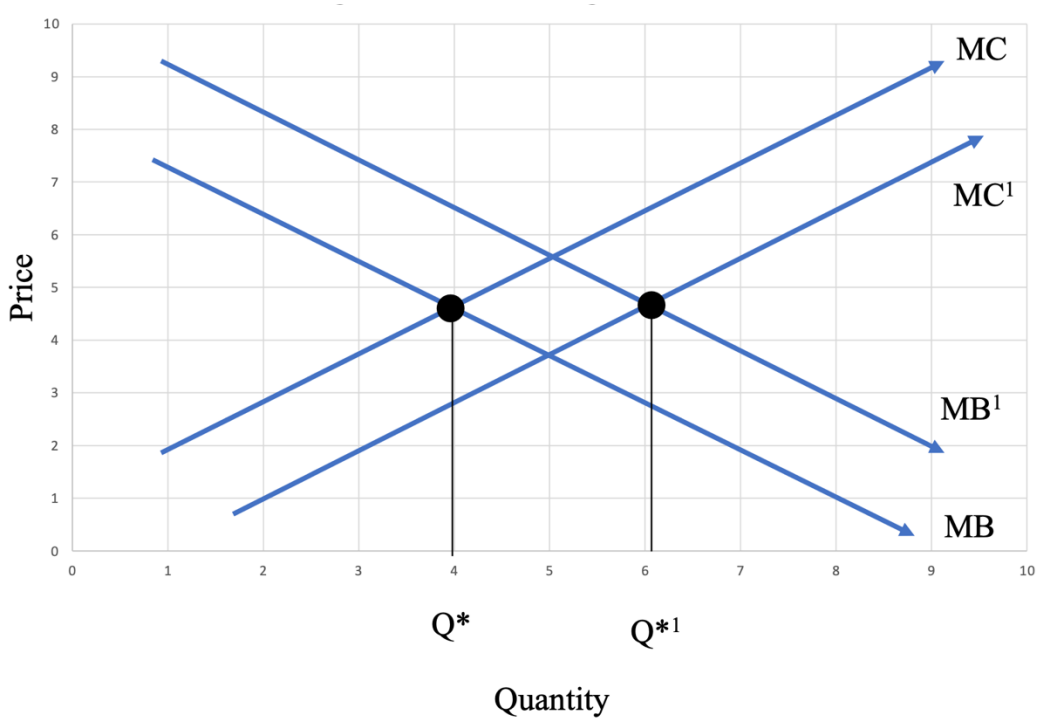
Bonger and Becker both address the necessity of crafting effective policies and procedures where the marginal costs of committing a crime exceed the marginal benefits. They emphasize the focus on social welfare ideology rather than how much crime contributes to the country's GDP. However, while Bonger's (1916) and Becker's (1968) work serves as the basis for modern economic theories of crime, several limitations need to be addressed. For one, both

articles were written in a time when the economy was much different. Policies, economies, and societies frequently change which is important to note especially when analyzing such a volatile issue. Second, both theories present 'global' problems in society that generalize the population too much. This section will focus on and analyze more recent economic theories of crime in an attempt to build on or challenge these classic theories.

In the past, scholars predicted the relationship between crime and the economy using traditional measures such as the unemployment rate. They theorized that when the economy faces a downturn, the "low opportunity costs and increased benefits of crime" incentivize criminal behavior (Rocque et al., 2019). This relates back to the marginal cost and marginal benefits model of crime. If the economy faces a downturn, people may face higher levels of unemployment and lower incomes influencing their perception of the marginal costs and benefits of turning to crime as an alternative solution. In turn, this would shift their marginal cost curve down and the marginal benefits curve out leading to a higher equilibrium point.

Figure 2 illustrates this change in marginal cost and marginal benefit curves. MC_1 and MB_1 represent the new MC and MB curves, respectively. As seen in the chart, the equilibrium point will shift outwards, and consequently, so will the equilibrium quantity denoted by Q^*_1 in Figure 2.

Figure 2: Modified Marginal Cost and Marginal Benefits



However, not all periods of high unemployment led to an increase in crime. Michael Rocque et al., (2019) explain this phenomenon in their paper where they propose the idea that a prominent Shadow economy serves as a moderator between unemployment and crime rates. Specifically, they argue the rise in unemployment causes an increase in the shadow economy.

Unlike the legitimate economy, the Shadow economy involves economic Indicators that often evade government detection. It provides an alternative source of employment when the traditional labor market declines. These items include under-the-table transactions, attempts to avoid taxes and regulations, and many other harder-to-detect actions. Rocque et al. (2019) explain that as the economy gets worse, crime rates do not always increase suggesting that other factors are at play. This pattern exists with all types of crime but especially with those that involve instrumental (material) or financial gains. The Shadow Market is an efficient one with low barriers to entry providing the incentive to enter the market.

Rocque et al. (2019) use Multiple Indicators Multiple Causes (MIMIC) estimates of the Shadow economy to measure its impact on two different types of crime: instrumental and violent. They test their hypothesis by running two fixed effects models featuring data from the Uniform crime reports, US Census, Bureau of Labor Statistics, National Prisoners Statistics, and University of Kentucky (UK) Poverty Center. Their dependent variables include instrumental crime rates such as robbery, larceny, burglary, and acquisition of property. The independent variables contain many control variables but most notably, the shadow economy measure (MIMIC) and the Unemployment rate. They found that the Unemployment rate had little to no effect on any of the crime rates while the Shadow economy was statistically significant in many cases.

This paper highlights alternative explanations about why some economic indicators appear to have little to no effect on crime rates. Even though Rocque et al., (2019) found no direct relationship between the unemployment and crime rates, that does not mean that the relationship doesn't exist indirectly. This occurred due to the positive relationship between unemployment and the shadow economy as the shadow economy serves as the relationship catalyst.

The second purely economic Theory of crime addresses the determinants of White-Collar crime as well as building a profile of that type of criminal. Benson & Simpson (2009) redefined white-collar crime by analyzing crime type in their book titled White-Collar crime: an Opportunity Perspective. They present their own set of attributes of someone who is likely to commit white-collar crime as someone of “high social status, respectability and elite occupational positions” (Benson & Simpson, 2009). Benson & Simpson (2009) present this as an opportunistic theory of crime. People who tend to commit White-collar crimes have ample

opportunity to violate the law in this way. This could be abusing password privileges to sensitive data files or even overseeing and tampering with financial statements.

Although White-collar crime represents only a subsection of all crime types, it introduces the idea of opportunity. This contributes to the marginal costs side of the equation. Marginal costs of committing a crime will be lower if the individual has low barriers and high physical accessibility. In other words, people will commit a crime if they can do it easily.

This section painted a general overview of some of the major economic theories of crime. In summary, people respond to economic downturns by taking advantage of the shadow market, or in the case of a White-collar criminal, taking the opportunity to make illegal instrumental gains at their own business or place of employment. These tactics take advantage of decreased marginal costs and lower barriers to entry. On the other hand, Bonger and Becker propose a way to increase that marginal cost by finding the optimal level of punishment for crime mitigation. These theories, however, lack the humanistic side of the equation.

Psychological Theories of crime

Alongside Economists, many Psychologists have pondered over what causes variations in crime rates across different populations. This section answers two primary questions. The first analyzes whether or not people actually weigh the costs and benefits of committing a crime. If so, the second addresses the role that social norms play in an individual's propensity to commit a crime.

An overview of the foundations of psychological crime theories will serve as the base to answer these two key questions. Moore (2011) overviews five classic psychological theories of crime based on the fundamentals of psychology. The first argues that criminal behavior is learned through operant conditioning where delinquent adolescents receive positive

reinforcement from parents rather than disciplinary action. The second theory finds a negative relationship between IQ and delinquent behavior. People with lower IQ do worse in school and, in return, receive negative treatment from their peers, parents, and teachers leading to negative self-perception. After not performing well in school, these individuals find themselves with limited access to employment and a correspondingly low income (if any).

The third group of theories attempts to build a psychological profile of a criminal based on personality. In Freudian psychology, the personality is split into three groups: the id, ego, and superego. The id represents an individual's primitive sexual and aggressive drives. In contrast, the superego serves as the moral compass. The ego moderates between the id and the superego making sure that both are satisfied. Delinquency occurs when there is a conflict between the id and the ego triggering a severe defense mechanism and sparking the need to act out in irrational ways (Moore, 2011). The fourth area focuses on atypical behavior caused by pre-existing psychological disorders. Individuals who fall into this category tend to commit more serious offenses such as violent crimes or even murder. Finally, the last type of psychological theory stems from developmental psychology. Like the first ideology, the developmental theory predicts that crime occurs when parents or social groups normalize criminal behavior, which can lead to more severe or persistent types of crime. This next section will discuss more relevant and recent theories of psychological crime that stem from these fundamental models.

One such group of psychologists, Kroneberg et al., (2010), investigated the moral aspect of crime. Their main argument challenges the ideology of the rational criminal who actively assesses the associated costs and benefits of committing an offense. However, their research led them to conclude that “only a subgroup of actors [actors’…] behaviors follows [follow] a cost-benefit calculus” (Kroneberg et al., 2010).

They utilize several different methods to test this hypothesis. The data for their analysis came from a study conducted from 2005 to 2006 involving a sample of 2,130 adults from Dresden Germany. The first model known as the Instrumental Consumer Theory (RCT) describes a rational criminal's utility function of committing a crime as SEU[s] = q*B+p*C. Where… SEU = Subject's estimated utility, S = offense, B = benefits to an offense, Q = probability of success, C = perceived penalty and P = probability of being caught.

The second model extends the RCT by adding N to represent a psychological cost such as guilt. Finally, they test the frames selection model which analyzes the interactions between the normalized psychological component and the benefits term as well as the term of the cost. It is formalized as N x (q x B) or N x (p x C). This interaction depends on the absence of effective neutralization and can explain why "internalized norms can lead actors to disregard instrumental incentives" (Kroneberg et al., 2010) suggesting that the decision to commit a crime does not always involve maximizing monetary gains especially if the individual follows social norms.

Kroneberg et al. (2010) ran a probit regression to test these hypotheses and found that models 1 and 2 hold statistical significance while model 3 does not. These findings suggest that coherence to social norms does impact a person's probability of committing a crime. Instead, they propose that people who ignore social norms are more likely to commit crimes but also run an internal cost-benefit analysis.

Similar to Kroneberg and colleagues' (2010) moral norms theory, Robert Agnew (1991) analyzes predictors of crime through a psychological lens. Agnew's research aimed to dispel the social control theory by running a longitudinal test comparing social control attributes by delinquency type. Social control describes the idea that "individuals are prevented from engaging in delinquency by bonding to society" (Agnew, 1991). This can be illustrated in four main ways:

attachment to a parent or teacher, commitment to goals, involvement in conventional activities, and belief in conventional norms.

Agnew (1991) ran a causal model on a longitudinal data set from the National Youth Survey. He incorporated several social control variables such as parental attachment, school attachment, commitment, and deviant beliefs. He also included a variety of offenses in the model namely felony assault, minor assault, felony theft, minor thrift, illegal services, and status offenses. Agnew's results indicated little to no correlation between delinquent behavior and social control aspects. His study shows that the probability of delinquency is not impacted by the level of societal engagement or control. Rather, people who interact with society in one of the four ways mentioned above also have the potential to commit crimes.

Each theory discussed thus far provides the psychological context to criminal behavior by underlining the cognitive factors that can either increase or decrease an individual's propensity to commit a crime. Researchers found that neither cultural, societal nor moral norms play a significant role in predicting crime, which contradicts those founding theories of crime. However, they do verify that criminals act somewhat rationally as they weigh the costs and benefits of committing a crime. Combining this with the previous section, criminals act when an opportunity presents itself but are unbound by the moral and social standards when evaluating the consequences. Regardless, these theories demonstrate the criminal decision-making process does involve assessing costs and benefits. The next portion will attempt to marry the two schools of thought by addressing the economic strain theory.

Economic Strain Theory of Crime

After reviewing each exclusive economic and psychological theory of crime, it becomes ever more apparent to combine the two for a more holistic approach. Originally developed by

Robert King Merton and Robert C. Merton (1968), the economic Strain theory merges these two schools of thought into one cohesive crime model. In short, the economic Strain theory involves an individual or household experiencing economic deprivation of some sort and psychological stress response which culminates in criminal behavior out of anger or desperation.

Merton & Merton (1968) founded the Strain theory in their work on social theory and social structure. They agree with the Freudian ideology that human beings will instinctually breakthrough social control due to biological impulses (Merton & Merton, 1968). However, the main premise states that increased pressure from society to achieve certain goals leads to a psychological reaction of stress or strain resulting in an increase in crime. They describe strain as either structural (societal pressure) or individual (based on own desires). People who fall short of these goals turn to crime to achieve them, often having a financial motive. From this theory, many others have been established and will be explained further in this section.

A few decades after Merton and Merton (1968) established the strain theory of crime, Agnew & White (1992) expanded on this theory and tested its validity. They first define two different types of strain. The first occurs when others prevent or threaten to prevent you from achieving positively valued goals. The second involves "remove [removing] or threaten [threatening] to" destroy all positive stimuli such as the loss of a loved one while the third involves negative or stressful relationships and life events. They argue that delinquency occurs for two main reasons: revenge and suppressing feelings of strain. Agnew & White (1992) tested this theory by a standard OLS regression analysis and found support for the general strain theory.

Farnworth & Leiber (1989) look at the economic Strain theory through the perspective of Income and Educational expectations. Their research tests the Meritocratic theory that suggests that society determines power levels according to their merit. People who achieve economic

success do so through “effort and ability” via higher levels of education (Farnworth & Leiber, 1989).

Farnworth and Leiber (1989) tested this theory by surveying 1614 participants between the ages of 15-18 of lower economic status. They found that many of the participants indicated that they would like to go on to higher education where their expectation for to do so was low. This causes internal stress and is correlated with higher levels of nonutilitarian delinquency. While this study did find evidence that supported the Meritocratic theory of economic Strain, it failed to provide a sample that accurately reflected the population. Specifically, of the 1614 participants, 75.2% were male and 30.5% were nonwhite indicating a sample bias.

The final variation of the Economic Strain Theory discusses the elements that can lead to juvenile extremist attitudes by using the general strain theory as its framework. Nivette et al., (2017) define general strain and its social and psychological implications. Their basic model describes the situation where a marginalized child will be more likely to commit a violent crime due to discrimination, stress, isolation, and other obstacles that prevent them from achieving their goals.

Their paper introduces the concept of vicarious strains where an individual experiences strain through another person. Nivette et al. (2017) also define the moral neutralization and moral disengagement theory. The former involves “disengagement from moral self-sanctions” and the latter refers to the individual reputing their “inner obligation to comply with the law” (Nivette et al., 2017). They primarily found that the main determinants of this extremist thinking were moral disengagement rather than strain. Like the article by Stolzenberg et al., (2006), this study proposes that people who have higher levels of strain will also have increased perceived marginal benefits with minimized marginal costs.

The article, overall, provides key details relating to general strain theory and its psychological and sociological consequences. With that being said, the data used in the regression analysis covers individuals between the ages of 7 and 17. They selected a limited pool of participants all from the City of Zurich. As mentioned previously, the paper provides the social and psychological factors that lead to criminal activity as part of the overarching strain theory. However, they do not address the economic subcategory of general strain.

Each of these variations of economic Strain Theory successfully combines the economic and psychological theories discussed earlier. They illustrate the economic hardship families go through, the associated psychological responses, and the eventual turn to crime. This model of crime considers the economic incentives and psychological motivations as the benefits of crime as well as the idea that stress causes a decrease in perceived marginal cost. However, these articles all exclude one main contributor, race.

Economic Strain Theory and Race

The previous definition of the Economic Strain theory leaves out an essential piece to the puzzle, race. As mentioned earlier, individuals and groups have different marginal cost and benefit curves due to their varying life situations. Throughout the course of history, Black Indigenous People of Color (BIPOC) disproportionately suffer in all aspects compared to their White counterparts. This has to do primarily due to the relentless cycle of systematic racism in this country. Therefore, the next section will account for that racial element by analyzing the economic Strain theory alongside racial demographics.

The first theory comes from Liska & Bellair (1995) who propose that high crime rates create a dangerous living environment and, thus, drive away those who can afford to move. Those who can afford this luxury have more disposable income and are generally wealthier than

White people. Similar to Farnworth & Leiber (1989), Liska & Bellair (1995) test the Meritocratic ideal that proclaims that not everybody has an equal opportunity to succeed.

They look at the relationship between crime rates and race in a slightly different way. They propose that an increase in crime leads to a substantial number of White people migrating away from those areas with high crime rates. They utilize a panel data set consisting of data from Uniform Crime Reports and the U.S. Census and add lagged variables in order to build on previous work. They measure the change in the nonwhite population and violent crime rate along with the independent variables, most notably, median income, percentage of unemployed, and percentage below poverty. After running a series of panel data regressions, they found that their hypothesis holds true. They found that variations in crime rates can be explained by understanding that People of Color and those of a lower socioeconomic status have greater disadvantages than those raised in privilege. Because they must deal with inequality as well as poverty, they will be more likely to commit crimes as a means of survival.

Liska & Bellair (1995) provide useful insight into the role of white privilege and the segregation effect on crime. With that said, one major problem with this research model is that their unit of analysis is country-wide rather than focusing on individual differences between cities or even states. Aggregating the crime rate and other variables overlooks the importance of state and or city characteristics that will not be accounted for without disaggregation.

Similar to Liska & Bellair, Stolzenberg et al., (2006) answer many of these key questions in their article by testing two conventional theories of race and crime: relative deprivation and macrostructure. The relative deprivation theory assumes that households or individuals compare their level of economic deprivation to that of another group. This comparison leads to a psychological reaction of fear or anger and would increase the crime rate of that marginalized

group. The second theory, the Macrostructural theory, proposes that an increase in racial segregation within a city reduces the interracial crime rate.

In order to test these two theories, Stozenberg et al. (2006) run five different OLS regressions. After finding flaws with other scholarly articles' proxy for the crime rate, they disaggregated the crime rate using data from the National Index-Based Reporting System (NIBRS). They split the dependent variable into groups that explain the relationship between offender and victim (White-on-White, White-on-Black, Black-on-White, and Black-on-Black) where the first term is the offender and second is the victim. They use the following independent variables: White to Black inequality, Black-White unemployment, total inequality, White to White inequality, Black inequality, racial segregation, unemployment rate (white and black), city disadvantage, total population, percentage of the Black and southern cities.

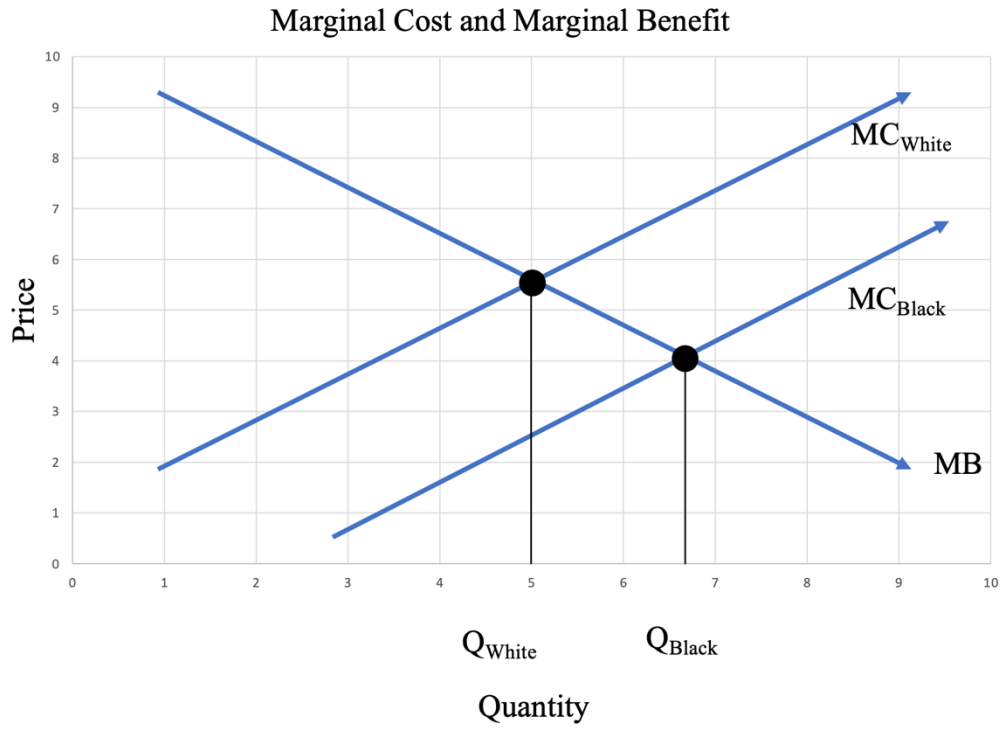
Their findings align with both the relative deprivation and macrostructural theories. Stolzenberg et al., (2006) found comparing income does in fact lead to an increase in crime but only in the intraracial crime subsections. On the other hand, the macrostructural theory suggests that interracial crimes increase with higher levels of integration. However, the most important takeaway is that city disadvantage played a significant role in almost all the models leading to increases in crime rates.

With that said, the study had several limitations. For one, their sample only included small cities from 15 of the 50 states. They also analyze only two races and exclude all instances where the victim could identify the offender. However, this article aligns most with this current paper and then attempts to thoroughly study the Economic Strain theory and racial relationship with crime causation.

Adding this racial element into the model of crime helps to explain why some people are willing to commit crime even if the gap between marginal costs outweigh marginal benefits. They will, out of desperation, commit crimes out of the need to survive. The segregation level in the community contributes significantly to certain crime types as wealthier white people will migrate away from cities with high crime rates. Additionally, cities with increased disadvantages also tend to have an overall higher crime rate. These conditions impact their perceived marginal costs and benefits which shift their equilibrium point.

In general, Stolzenberg et al., (2006) hypothesize that the Black population will have a perceived marginal cost curve while White people will have the opposite. This trend is modeled below in Figure 3 which shows the MC curves for White Americans and Black Americans. Because MC_{Black} is an outward transformation of MC_{white}, the equilibrium quantity for Black people, as depicted by Stolzenberg et al., (2006), will increase.

Figure 3: Marginal Cost and Marginal Benefits for Black and White People



Conclusion

This portion of the paper overviewed a variety of crime theories. The first group of papers underlined the founders of economic crime theories and several others that attempted to build variations of said theories. While each provided logical reasoning for the variation in crime rates, they left out the Sociological and psychological aspects. Thus, several psychological and sociological theories were analyzed in the following section. These theories evaluated crime determinants on an individual level using survey data but lacked the economic implications. The economic Strain Theory combined the two of these by evaluating the economic Strain Theory of crime which found strong validity. Finally, an important factor, race, was added to the discussion finding that People of Color face the greatest economic strain explaining why there are higher crime rates in that population than in others.

The conventional school of thought assumes a rational criminal; one who weighs the marginal costs and marginal benefits of committing a crime. People will evaluate the benefits of committing a crime through material and monetary gains. They will also assess the possible consequences or barriers such as lack of opportunity and level of law enforcement and punishment. However, many papers presented in this section suggest a more complex model where different characteristics of a criminal and their circumstances could shift either the MB or MC curves.

Each of the psychological theories of crime provided mixed conclusions about the role of morality in the criminal decision-making process. They all agree that people who stray from social norms act rationally by weighing costs and benefits. However, the evidence varies when considering whether morally righteous people also commit crimes. One possible explanation could be due to economic strain and racial inequality. People in more desperate situations may be more likely to commit a crime even if they follow social standards of morality. They may be likely to accept the higher costs of committing a crime due to their circumstances.

Overall, many of these theories left out significant variables as well as used a biased or faulty proxy for the crime rate. This paper will attempt to fix many of these limitations by expanding on the Economic Strain Theory and Race by analyzing state or city level data in relation to crime rates.

CHAPTER 3: DATA ANALYSIS

The data used in this project comes from the FBI and the US Census. This data provides city-level demographics to predict the total crime rate. The dataset includes 203 city-level observations sampled from the year 2019. While individual-level data would have been more accurate in terms of measuring the direct effects of the Economic Strain Theory, City data contains higher levels of variation between each observation than state level. For instance, state data would include only 50 observations where there could be more than one city representing each state.

Because the data set comes from two different sources, matching each observation posed several limitations. For one, the NIBRS and US Census data collected their samples from different types of cities. The NIBRS had approximately 7000 cities while the American Census only had about 500. Therefore, once each city was matched, the current data set only has 203 observations. Furthermore, the population size of this simplified sample has a minimum of 60,760 and a maximum of 7,573,136 but an average of 441,060 meaning that most of the cities in the set fall in the lower end of the spectrum. In other words, the sample does not include metropolitan areas such as Chicago, New York City, or LA. Rather, they are either micro or metro areas.

The table below presents the summary statistics of each variable. These statistics include the number of observations, the arithmetic mean, standard deviation, minimum value, and maximum value.

Table 1: Descriptive Statistics

Variable	Obs.	Mean	Std.Dev.	Min.	Max.
Total crime rate	203	.029603	0217663	.0003788	.2162851
Total crime rate against persons	203	.0072918	.006519	.0000591	.0704048
Total crime rate against property	203	.0176648	.0129562	.000291	.1153677
Total crime rate against society	203	.0046599	.0038086	.0000288	.0305126
PCTMale	203	.4930631	.0109366	.4600536	.5226161
PCTHHonSNAP	203	.1130077	.0436671	.0420109	.2627622
Unemployment Rate	203	.044803	0169271	.012	.148
PCTBlack	203	.0857291	.1170114	.201	.965
PCTWhite	203	.8225961	.1026804	.002	476
PCTHHsinglemother	203	.1127067	0301094	.0490064	.2207537
PCTnohs	203	.0647882	.0238863	.022	.157
PCTadolescence	203	.132245	.0161202	.0928606	.1878086
PCTbelowpoverty	203	.0882217	.0370522	.023	.226
Gini	203	.449199	.0280487	388	.5409
Totalpopulation	203	441060.9	894576.7	60760	7573136
logTotalpopulation	203	12.31027	.9858096	11.01469	15.84012

Among all the literature reviewed in the previous section, the most accurate proxy for crime rate includes that from the FBI's National Incident Reporting System. This newer method of recording crimes contains all crime-related events that occurred in that year, sorted by type. Unlike arrest reports, the NIBRS measures incidents reported to the police regardless of whether further action was taken. It also limits the chance of racial profiling affecting the results of the

analysis. The FBI and scholars alike strive to make this system the primary method of collecting crime statistics due to the level of detail recorded in each incident.

In this research paper, the crime rate is calculated by dividing the number of incidents in a particular city by its total population. For example, Richmond Virginia had 19,702 incidents in the year 2019 with a total population of 1,290,866. Dividing 19,702 by 1,290,866 yields a crime rate of .01526 or 1.526%. The model disaggregates crime rates further by type: crimes against persons, property, and society. The first defines crimes that cause harm to another human being while the second involves crime for the purpose of monetary gain. The last, crimes against society, are usually victimless. However, it is important to note that the crime rate represents the number of incidents in that city, not how many people were arrested. Of the 203 cities included in the sample, Lima Ohio has the highest crime rate standing at 21.62% while Cleveland Ohio's rate is just .037%. Interestingly, these two cities are in the state of Ohio.

The remaining data comes from the US Census's American Community Survey (ACS), which collects information from individuals and households every year with the primary goal of determining "how more than $675 billion in federal and state funds are distributed each year" (US Census Bureau, 2022). Based on the model of Economic Deprivation and Crime, the survey data will be broken into three different categories: Demographics, Economic Stress Indicators, and Psychological/Societal Stress Indicators.

The first part of the Economic Strain theory proposes that families or individuals who experience greater economic strain have an increased propensity to commit a crime. Several variables included in the model mimic some of these financial struggles. Because these cities vary in size, each variable will be represented in terms of the percent of the city that fits into that category (excluding total population and GINI coefficient). These variables include the poverty

rate, GINI coefficient, unemployment rate, and percent of households on public assistance programs (SNAP in this case). Rather than representing economic stress in terms of one variable, many variations were included to provide further context into the multifaceted realm of financial inequality.

Moreover, two variables, the percentage of the population below the poverty level and the GINI coefficient, directly measure economic deprivation. As Stolzenberg et al. (2006) proposed in their paper, crime rates may increase when a group of people compares their individual economic conditions to that of another. In this case, when dealing with city-level data, this theory can be observed via the number of people living under the poverty rate as well as the GINI coefficient. The prior, percentage of people living in poverty, suggests a positive relationship between poverty and crime signifying a city that struggles to provide its citizens with proper services and resources and, perhaps, a higher crime rate. Similarly, the GINI coefficient measures the distribution of income inequality. If a city receives a number close to 1, the income distribution mimics perfect inequality and vice versa for a score of 0. Therefore, based on the Relative Deprivation theory proposed by Stolzenberg et al. (2006), a positive correlation should be anticipated.

The next set of independent variables measures the demographics of the city including race (White and Black), gender, and education level. These variables test whether the crime rate is affected by the variations in population demographic distribution. As the primary research question addresses the implications of race on the Economic Strain Theory, the ratio of people who identify as Black will be included in the model. The others account for possible factors that may affect the crime rate.

Finally, the last group of variables describes other forms of psychological and or societal stressors not directly related to Economic indicators. These include the education level and percent of households with a single mother. These variables were selected based on Stozenberg's City Disadvantage measure of Economic Stress. However, for this project, they will be separated to see their individual effect on the dependent variable.

Methods

After collecting the data, several multiple regression analyses are used to see which city-level variables have the greatest impact on crime rates. Using a regression analysis gives predictive power to the model as it forms a line of best fit with all the data points. This model uses the different crime rates as the dependent variables and all other city demographics as the explanatory variables.

When using a regression model, several assumptions must be addressed in order to ensure that the model or the variables used are unbiased. These assumptions include linearity, random sample, no perfect collinearity, zero conditional mean, homoscedasticity, and normality.

The first major assumption to consider is whether each variable follows a linear pattern. Generally, the relationship between the dependent variable and the independent variable should have a linear form. In the case of this study, none of the variables (except for the total population) needed a logarithmic or exponential transformation.

The next relevant assumption about linear regressions involves a concept called multicollinearity. Multicollinearity occurs when several variables in the model are highly correlated with each other. The problem lies with the fact that retaining variables with high multicollinearity creates redundancy in the model. A variable inflation factor analysis will be performed in order to determine the level of multicollinearity.

Finally, the last major aspect of a regression analysis assumes heterogeneity rather than homogeneity. A model with no homogeneity will have a dependent variable whose error term has the same variance as the explanatory variables. If the regression fails this test, it will have biased standard errors and need to include a robust transformation.

After correcting the base models for linearity, multicollinearity, and heteroskedasticity, interaction terms will be introduced. An interaction term describes the combined effect of two variables together on the dependent variable. Because the paper looks at the relationship between race and the Economic Strain Theory, interaction terms between race and three main predicted determinants of crime will be intersected. These include the percentage of the population who identifies as Black * percent of the population below the poverty rate, the Gini coefficient, and the percent of the population who are between the age of 10 and 19. Due to the risk of homoscedasticity, each of the interaction terms will be added to the four models one at a time.

With that said, based on the literature review and assumptions from the Economics Strain Theory, the following should be expected to occur in the model.

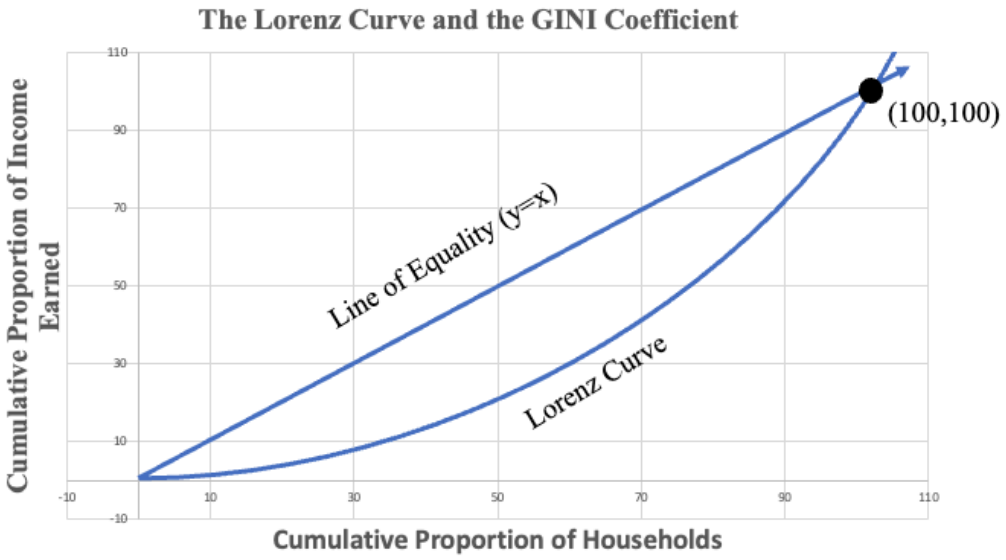
Table 2: Predicted Signs

Variable	Description	Predicted Impact on the Dependent Variable
Male	Percent of the city's population that is male, mainly used for demographic information	Positive
% of HH_on_SNAP	Percent of the city's households that are on SNAP, a public assistance program	Positive
Unemployment Rate	The percent of the population who is currently unemployed but searching for a job	Positive or no effect
White	Percent of the city's population that identifies as White	Negative
Black	Percent of the city's population that is Black	Positive
HH_Single_Mother	Percent of households that are run by a single mother	Positive
PCTnohs	Percentage of the city's population that does not have a high school degree	
Below_Poverty	Percentage of the city's population that lives below the poverty rate	Positive
Gini Coefficient	Distribution of income within the city population measured on a scale from 0 to 1 (0 being perfect equality and 1 being perfect inequality)	Positive
logTotalpopulation	The logarithmic transformation of the city's total population	Positive or no effect

Although each trend is predicted to play a significant role in determining crime rates, a few key relationships will be explored further. For one, the poverty rate illustrates Economic suffering more sufficiently than other variables in the model. According to the Office of the

Assistant Secretary for Planning and Evaluation in the U.S Department of Health and Human Services, the 2019 poverty threshold for a single household was $12,490 and $25,750 for a family of four. Considering that families have many expenses such as food and utilities as well as the positive rising market cost of basket goods, $25,000 is hard to live off. With that said, when a city experiences a high level of poverty, it would be expected that it increases the crime rate as the city collectively would experience a great amount of economic stress.

Figure 4: The Lorenz Curve and the GINI Coefficient



The next variable of interest is the Gini coefficient. This variable captures the distribution of income throughout all households in a given population. It utilizes the Lorenz curve which plots the cumulative portion of households against the cumulative proportion of income. A society with perfect equality will have a curve with a 45-degree slope while one with perfect inequality will look more like a vertical line at the end of the x-axis. The Gini coefficient takes the difference between the actual income distribution, the Lorenz curve, and the perfect inequality line. This model is depicted above in Figure 3.

This variable is predicted to play a significant role in the model as income disparity connects to Liska & Bellair's (1995) theory relating crime rates and disadvantaged neighborhoods. They propose that People of Color face greater Economic disparity than their White counterparts leading to a higher crime rate. Therefore, a city with a greater Gini coefficient should face higher crime rates.

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Furthermore, the effect of age on crime rates will be explored as much of the literature surrounding economic determinants of crime involve delinquency as a primary factor. These theories presented by Moore (2011) stem from the psychological field of study and involve the intricacies of adolescent cognition and its relationship to delinquency. Moore (2011) explains that adolescents to have trouble deciding between the id and the ego which can cause them to act in irrational ways. Thus, areas with larger amounts of young adults may experience higher crime rates. Interacting these terms with racial distribution allows the analysis of the combined effects and, according to the literature review, should increase crime rates.

Finally, the total population was included as a control variable since many of the cities included vary in terms of size. For example, the city with the lowest population, WallaWalla, WV, has a population of 60,760, while the city with the highest population, Dallas, TX, has 7,573,136 people. This difference exceeds 7 million people and should be considered to have a potential impact on variations of crime rates.

Results

In order to test which of the aforementioned determinants have the greatest effect on each of the disaggregated crime rates, four separate regression analyses are conducted. This analysis tests the validity of the Economic Strain Theory as it pertains to the city level demographics and determines outlined earlier.

As mentioned earlier, several assumptions must be satisfied for the model to have predictive power. The model corrects the first assumption, linearity, by logarithmically transforming the total population variable. The other variables do not need such transformations as they already represent the proportion of the population that falls into that category. Therefore, in each subsequent variation, the total population will be transformed.

The next assumption, homoskedasticity, ensures that the standard errors of the regression remain unbiased. A standard OLS model requires that the dependent variables and the error terms have no correlation with one another. A high correlation means that variance of the error term will increase as the dependent variable increases. If that exists in the regression, it will violate the best linear unbiased estimator suggesting that other estimators will be more accurate for modeling the data set. Running both a White and Breusch-Pagan test can determine the necessity of robust errors. These analyses run a hypothesis test where the null signifies homoscedasticity and the reverse for the alternative. After conducting both tests for each regression, the null hypothesis was rejected in favor of the alternative implying heteroskedasticity. Because of this, all variations were corrected using robust standard errors.

Finally, each regression contains four variations where each interaction variable will be added one at a time to reduce collinearity. Keeping these interaction terms isolated accounts for the possibility of those terms being too closely correlated.

With that said, the following section will display the results of running these 16 regressions and which relationships hold the greatest statistical significance.

The first regression analysis looks at the relationship between the total crime rate and the independent variables by using the total crime rate as the dependent variable. The base model thus far stands as:

$$Totalcrimerate_i =$$

$$+1PCTMale+2PCTHHonSNAP+3UnemploymentRate+4PCTBlack+5PCTWhite+$$

$$+6PCTHHsinglemother+7PCTnohs+8PCTadolescence+9PCTbelowpoverty+$$

$$+10Gini+11logTotalpopulation+ui$$

for $; i = 1; 2; ...; 203$

Table 3: Regression with the total crime rate as the dependent variable

Variable	(1)	(2)	(3)	(4)
PCTMale	.1749 (.341)	.1787 (.338)	.1794 (.337)	.2313 (.244)
PCTHHonSNAP	-.0714 (.161)	-.0672 (.175)	-.0659 (.180)	-.0693 (.167)
UnemploymentRate	-.1435 (.118)	-.1435 (.119)	-.1491 (.108)	-.1767 (.059)
PCTBlack	-.0365 (.142)	-.0095 (.869)	.1460 (.628)	-.3702* (.010)
PCTWhite	-.0390* (.007)	-.0403* (.004)	-.0398* (.006)	-.0341* (.024)
PCTHHsinglemother	.2532 (.074)	.2439 (.071)	.2468 (.073)	.2643 (.063)
PCTnohs	-.1681* (.026)	-.1740* (.025)	-.1691* (.027)	-.1460 (.053)
PCTadolescence	.0669 (.547)	.0697 (.533)	.0684 (.538)	-.0762 (.471)
PCTbelowpoverty	.1762* (.017)	.1927* (.010)	.1751* (.019)	.1724* (.018)
Gini	-.0974 (.248)	-.0992 (.247)	-.0680 (.331)	-.0953 (.251)
logTotalpopulation	.0048* (.006)	-.0052* (.013)	-.0049* (.007)	-.0042* (.011)
PCTBlack* PCTBelowpoverty		-.2104 (.533)		
PCTBlack*GINI			-.3915 (.542)	
PCTBlack* PCTadolescence				2.502* (.031)
Constant	.0545 (.521)	.0579 (.485)	.0407 (.660)	.0315 (.726)
R^2	.1704	.1716	.1728	.1879

Note: Coefficients with a p-value below .05 are denoted by a *

Using a 95% confidence level, the variables Percent White, no high school, below poverty, and total population are statistically significant from 0 in each variation. Additionally, the interaction term between Black and adolescence is statistically significant in the fourth variation when it was included in the model. On average, each variation had a decent r-squared each being around 17% meaning that 17% of the variation in the dependent variable can be explained by the independent variables.

The second regression analyzes the same relationship between dependent and independent variables but using the crime rate against property as the dependent variable.

$$\text{Crimerateagainstpersons}_i = +1\text{PCTMale}+2\text{PCTHHonSNAP}+3\text{UnemploymentRate}+4\text{PCTBlack}+5\text{PCTWhite}+ +6\text{PCTHHsinglemother}+7\text{PCTnohs}+8\text{PCTadolescence}+9\text{PCTbelowpoverty}+ +10\text{Gini}+11\text{logTotalpopulation}+ui$$

for $; i = 1; 2; ...; 203$

Table 4: Regression with Crime Rate Against Persons as the Dependent Variable

Variable	(1)	(2)	(3)	(4)
PCTMale	.0718 (.199)	.738 (.194)	.0737 (.193)	.084 (.167)
PCTHHonSNAP	-.0173 (.216)	-.0149 (.264)	-.0149 (.253)	-.0167 (.224)
UnemploymentRate	-.0509* (.033)	-.059* (.035)	-.0532 (.027)	-.0585* (.018)
PCTBlack	-.0027 (.743)	.0119 (.529)	.0745 (.461)	-.0793 (.084)
PCTWhite	-.0046 (.330)	-.0053 (.233)	-.0049 (.289)	-.0034 (.496)
PCTHHsinglemother	.1109* (.012)	.1059* (.011)	.1081* (.011)	.1134* (.011)
PCTnohs	-.046* (.017)	-.0494 (.013)	-.0466* (.017)	-.0411* (.034)
PCTadolescence	.0286 (.359)	.0301 (.340)	.0292 (.347)	-.0043 (.872)
PCTbelowpoverty	.0249 (.224)	.0338 (.087)	.0244 (.238)	.0240 (.241)
Gini	-.0239 (.371)	-.0249 (.359)	-.0115 (.570)	-.0234 (.374)
logTotalpopulation	-.0012* (.026)	-.0014* (.029)	-.0012* (.027)	-.0010* (.032)
PCTBlack* PCTBelowpoverty	--	-.1139 (.271)	--	--
PCTBlack*GINI	--	--	-.1655 (.443)	--
PCTBlack* PCTadolescence	--	--	--	.5748 (.126)
Constant	-.0094 (.707)	-.0076 (.756)	-.0153 (.572)	-.0147 (.587)
R^2	.1815	.1852	.1862	.1918

Note: Coefficients with a p-value below .05 are denoted by a *

At a 95% confidence interval, the significant variables include Unemployment rate, PCTHHsinglemother, PCTnohs and logTotalpopulation. This set of analyses has a similar r-squared value to the total crime rate set ranging from 13% to 19%.

The next regression analysis focuses on crimes against property as the dependent variable. After correcting for heteroskedasticity and logging the total population, the models is:

$Crimerateagainstproperty_i =$

$+1PCTMale+2PCTHHonSNAP+3UnemploymentRate+4PCTBlack+5PCTWhite+$

$+6PCTHHsinglemother+7PCTnohs+8PCTadolescence+9PCTbelowpoverty+$

$+10Gini+11logTotalpopulation+ui$

for; $i = 1; 2; ...; 203$

The variables that are statistically significant in this model differ a bit more between each variation. The regression with no interactions had the poverty rate and total population as significant variables which change the crimes against property rate. The variable HHsinglemother was also statistically significant when adding the percent Black and Poverty, as well as the Gini coefficient and Black. The last variation also has the percent of the population who is Black as significant from 0. Below, Table 4 displays the results from running this regression.

Table 5: Regression with Crimes Against Property as the Dependent Variable

Variable	(1)	(2)	(3)	(4)
PCTMale	.0865 (.422)	.0872 (.426)	.0881 (.420)	.1225 (.291)
PCTHHonSNAP	-.0345 (.257)	-.0337 (.258)	-.0324 (.273)	-.0331 (.268)
UnemploymentRate	-.0743 (.222)	-.0743 (.223)	-.0764 (.213)	-.0956 (.123)
PCTBlack	-.0342* (.019)	-.0291 (.375)	.0325 (.846)	-.2477* (.004)
PCTWhite	-.0325* (.000)	-.0328* (.000)	-.0328* (.000)	-.0294* (.001)
PCTHHsinglemother	.1331 (.092)	.1314 (.081)	.1308 (.090)	.1402 (.073)
PCTnohs	-.1234* (.011)	-.1245* (.012)	-.1238* (.011)	-.1093* (.023)
PCTadolescence	.0236 (.738)	.0242 (.733)	.0242 (.733)	-.0679 (.348)
PCTbelowpoverty	.1224* (.009)	.1255* (.010)	.1220 (.10)	.1200* (.009)
Gini	-.0554 (.233)	-.0557 (.239)	-.0446 (.281)	-.0540 (.237)
logTotalpopulation	-.0022* (.032)	-.0023 (.058)	-.0022* (.034)	-.0018 (.062)
PCTBlack* PCTBelowpoverty		-.0398 (.837)		
PCTBlack*GINI			-.1432 (.691)	
PCTBlack* PCTadolescence				1.601* (.018)
Constant	.0434 (.397)	.0441 (.382)	.0383 (.484)	.0287 (.595)
R^2	.1665	.1666	.1673	.1867

Note: Coefficients with a p-value below .05 are denoted by a *

Finally, the last set of regression analyses has the crime rate against society as the dependent variable. After corrective for linearity and heteroskedasticity, the model is as follows:

$Crimerateagainstsociety_i =$

$+1PCTMale+2PCTHHonSNAP+3UnemploymentRate+4PCTBlack+5PCTWhite+$

$+6PCTHHsinglemother+7PCTnohs+8PCTadolescence+9PCTbelowpoverty+$

$+10Gini+11logTotalpopulation+ui$

for; $i = 1; 2; ...; 203$

This type of crime rate also has a greater variation between each additional model in terms of statistical significance. In the first variation, the Percent of the population that is Black, White, has no high school degree, living below poverty and the total population is all statistically significant. The second variation only has the percent of the population that is white has no high school degree and lives below poverty. The third also has the same as the second but has a total population as well. Finally, the last variation has the percent of black-white below poverty and the interaction between Black and adolescents. These results are depicted below in Table 5.

Table 6: Regression with Crime Rate Against Society as the Dependent Variable

Variable	(1)	(2)	(3)	(4)
PCTMale	.1444 (.650)	.0154 (.628)	.0153 (.635)	.0217 (.512)
PCTHHonSNAP	-.0206 (.036)	-.0195 (.046)	-.0195 (.047)	-.0204* (.038)
UnemploymentRate	-.0174 (.311)	-.017 (.307)	-.0183 (.283)	-.0214 (.217)
PCTBlack	.0001 (.996)	.0070 (.435)	.0379 (.396)	-.0431 (.089)
PCTWhite	-.0022 (.354)	-.0025 (.272)	-.0023 (.316)	-.0015 (.515)
PCTHHsinglemother	.0096 (.686)	.0071 (.760)	.0083 (.724)	.0111 (.645)
PCTnohs	.0018 (.906)	.0029 (.985)	.0016 (.917)	.0047 (.767)
PCTadolescence	.0148 (.413)	.0156 (.393)	.0151 (.402)	-.0035 (.851)
PCTbelowpoverty	.0297* (.026)	.0341* (.017)	.0295* (.027)	.0292* (.028)
Gini	-.0184 (.175)	-.0189 (.168)	-.0123 (.320)	-.0182 (.176)
logTotalpopulation	-.0013* (.000)	-.0014* (.000)	-.0014* (.000)	-.0013* (.000)
PCTBlack* PCTBelowpoverty		-.0564 (.359)		
PCTBlack*GINI			-.0818 (.374)	
PCTBlack* PCTadolescence				.3222 (.102)
Constant	.0221 (.159)	.0230 (.138)	.0192 (.269)	.0191 (.232)
R^2	.1926	.1953	.1960	.2021

Note: Coefficients with a p-value below .05 are denoted by a *

Discussion

After running the regression analyses, several expected relationships supported the hypothesis proving the legitimacy of the economic strain theory while others did not.

The first major variable of interest, the percent of the population below the poverty line, illustrates the Economic Strain Theory and its implications in the crime world. According to the analysis, as the number of people in a city who live under the poverty line increases, so does the city's total crime rate, the crime rate against persons, and society. Further, its positive relationship with these dependent variables and small p-value persists in every variation. This correlation implies a strong relationship between economic stress and crime rates which confirms the economic portion of the EST model.

Because of this trend, it can be inferred that people who live below the poverty line are most impacted by the ideas expressed in the EST. People in this situation may have an altered perspective of the MC of committing a crime. As explained earlier, living in a state of poverty minimizes their MC perceptions of committing a crime, shifting the MC curve and the corresponding equilibrium point out leading to an increase in the crime rate.

The next result that could be considered expected is the significance of the interaction between the percent of the population who is Black and adolescent. Much of the literature agrees that adolescent children have a hard time measuring the marginal costs and marginal benefits for a plethora of reasons, most notably, the lack of the prefrontal cortex responsible for decision-making. According to Carly Drzewieck and Jancie Juraska (2020) adolescent brains' frontal cortex shift and coincide with decision making. This cortical plasticity causes "environmental vulnerability" and higher risks for delinquency (Drzewiecki, C. M., & Juraska, J. M. (2020,). This trend also exists in the regression. However, because the term interacts with the proportion

of the population who identifies as Black, that aspect must be analyzed as well. This finding suggests that Black youth are more susceptible to crime and could, in turn, be impacted by the elements described in the economic strain theory.

Transitioning to the psychological aspects of the Economic Strain Theory, two variables, households on SNAP, and households with a single mother, held statistical significance in the model. First, households with a single mother had a positive relationship with the crime rate against persons (see Table 3). This held true in all four variations where a 1 percentage point increase in households with a single mother leads to around a 10 percentage point increase in the crime rate against persons. Unlike other variables, this coefficient was quite large with a p-value close to 0 signifying its importance. This paired with the large effect on the various crime rates proposes a shift to focusing on aiding families in this situation.

Households with single mothers may struggle more disproportionately than those with both parents present as these mothers must take care of the children while also providing for them. Therefore, that level of economic and psychological stress could prove to be detrimental to the city's crime scene. Interestingly, this relationship only occurs with the crime rate against persons. To recall, crimes against persons involve assault or abuse of other human beings which serves as a good proxy for a psychological stress indicator.

On the other hand, the variable households on SNAP have a negative relationship with the crime rate against society. Here, this inverse relationship initially did not make sense. However, people who receive Snap may be in a more stable mental and economic state than those who do not as the government does support them. This trend suggests that mitigating crime can be achieved by increasing or improving programs like this.

While many of the results positively supported the hypothesis of economic strain theory and race theory on crime, there exist several unexpected relationships. For one, the variable describing the percentage of the population with no high school degree had a negative relationship with almost all crime types. This creates an argument against the educational attainment theory of delinquency and strain. If that theory held true, there would have been a positive correlation rather than a negative one. However, adding a variable at the other end of the spectrum could help demonstrate this relationship more effectively.

Similar to the education piece having a reverse relationship with crime, the variable describing the percent of the population who identifies as Black had an adverse effect. Many of the literature did not explicitly state that Black people are more likely to commit crimes. With that said, many articles implied that higher concentrations of Black populations may lead to a correlation between property rates falling, migrations, and interracial crimes (Liska & Bellair,1995). The data trends in the regression do not reflect such theories. In fact, as the proportion of the population who is Black increases, the crime rates of that city decrease. This will be addressed later as we discuss the implications of race in the economic strain theory model and racial stereotypes.

Unlike the previous two variables, the next two surprising findings occurred due to a lack of statistical significance in the models. For one, the Gini coefficient was expected to be significant as it shows how income is distributed within a population. Theories such as the relative depreciation theory argue that crime can occur when people compare their economic conditions to that of another group (Stolzenberg et al., (2006). Thus, it would be expected that the Gini coefficient would increase the crime rate or, at a minimum, be statistically significant.

However, in none of the models does this variable have statistical significance. Therefore, it can be concluded that the poverty rate is a better predictor of crime.

Moreover, as stated earlier, of the three interaction terms included in the models, only PCTblack*adolescence was statistically significant. The interaction between PCTblack*gini could be explained a bit more than the other since Gini alone was not statistically significant from 0. On the other hand, while the poverty rate variable alone played one of the most important roles in these models, its interaction with the PCTblack held no significance. As racial implications and interactions served as the basis for most of the paper, the lack of overall significance came as a surprise. Therefore, it suggests that conclusions about race may also be insignificant.

With that said, several key points from the discussion add to the economic strain theory and overall ideation of crime. The first finds the poverty rate of each city as the best proxy for economic strain. With this variable being statistically significant in 12 of the 16 regressions, it holds great validity compared to others, specifically the Gini coefficient. Perhaps policymakers will focus on helping people out of the poverty cycle by increasing public assistance programs such as SNAP. This could prove to be especially effective as shown by the strong negative correlation between households on snap and crime rates. In the realm of crimes against persons, the standout predictor, in this case, is the percentage of households with single mothers. Future research should also include additional analysis regarding this topic and how it pertains to crime rates.

Moreover, the positive coefficient of households on SNAP further argues the importance of public assistance programs as a solution to reducing crime rates. Although initially predicted to have a negative coefficient, this variable shows that when people feel supported, their stress

response will be less and therefore, break them from the economic strain cycle. Hence, their perception of the costs and benefits of committing a crime will also be lower.

Research shows that convicted criminals remain on SNAP. For example, the state of North Carolina's Senate Bill 657 states that "an individual convicted of a controlled substance felony offense shall be eligible to participate immediately in the food and nutrition services program" if they are not in custody and if they participate in a substance abuse program (*General Assembly of North Carolina Session, 2021).* In essence, this shows that states do not disqualify convicted people from being on SNAP.

Finally, the last takeaway proposes the negative stereotypes surrounding Black population to be inaccurate. As seen in the regression results, the proportion of the population who identifies as Black actually leads to a decrease in the crime rate. Further, the only interaction term between PCTblack and the other three variables was statistically significant in only a subsection of the models. Perhaps adding some of the other races could lead to seeing a different trend.

The literature does suggest that looking at city-level demographics proved to be more significant than the interaction with race. The answer to the question of how to reduce crime does involve finding ways to mitigate the effects listed in the EST but suggests a more aggregate effect rather than a strong emphasis on racial implications.

Limitations

Although the results of the study support the original hypothesis, several limitations inhibit them from perfect predictability. For one, generalizing city-level data to an individual or micro-level model increases the risk of error and decreases the predictive power of the regression

model(s). Conducting the research again using an individual level would be most effective, however, the data for that is just not available.

Along those lines, the paper combined two data sets, one from the American Community Survey with 500 cities and the other from the NIBRS which included 7000. Merging the two created issues as only 203 cities matched. Perhaps, having a more robust data set where all the cities would be included from the American Community Survey would increase the predictive power of the mode. Unfortunately, this could have to do with the fact that the NIBRS collects data from a certain city profile. That is, most of the cities in the NIBRS had a smaller population than that of the American Community Survey. Moreover, unlike the Uniform Crime Reports, the NIBRS was just founded a few decades ago and its implementation into mainstream crime statistics is still in progress. Finding a way to get the demographic variables from the NIBRS or the crime data from the American Community Survey could solve this problem.

This chapter discussed the analysis of the data set chosen for the study. It started off by explaining where the data came from and why each variable was included. Next, it described the predicted results following the hypothesis that cities with a high level of economic strain theory variables and racial implications will increase crime rates. That hypothesis was tested by using 16 distinct regressions, each of which fell into one of the four categories of crime. From there, different conclusions were made based on the statistical significance of the coefficients. Overall, the models shed light on some predictors of crime rates as well as shift the perspective on which to direct focus.

CHAPTER 4: CONCLUSION

The paper presented the idea that the variations in crime rates can be explained by the Economic Strain Theory and racial implications. The study ran multiple regression analyses finding support for the Economic Strain Theory. It, however, lacked robust results and or statistically significant justifications. Thus, assuming that these results hold statistical significance, the paper falsifies common stereotypes about the Black population and crime and their propensity to commit crimes.

Further, it argues for a focus on improving public policy as a means of crime reduction. These policies can help prevent the ideas in the economic strain theory or poverty cycle from happening in the first place. This could include increasing economic support systems for families as proved effective by the statistical significance of the households on SNAP variable. They could further implement psychological treatments to aid in that aspect such as free therapy or coping skills in high schools.

With that said, those policies and procedures may come off as a bit socialist. So, instead, they should be built not to completely shelter people but give them that extra help to pull out of extreme suffering where their perception of the costs and benefits of crime are altered. Moreover, the results of the study encourage education on where these negative stereotypes baked into society come from. This will allow the evaluation of their validity as well as how to reframe them. It will also, hopefully, reduce the police brutality problem.

Because the regressions used city-level data rather than individual-level, it was not ideal for testing the Economic Strain Theory. It also only used data from one year, 2019, which did not include the covid pandemic. In the future, an analysis could be performed by looking at the household level demographics as well as possibly using time series for policy implications.

In summary, fine-tuning policies to break the poverty cycle will prove the most effective as seen in the data. Rather than remaining divided between profit and policy, the country must reunite in the name of human rights by finding that equilibrium point. Over 100 years ago, Bonger (1916) argued for this unitedness as does modern-day reporter Bunn. Bunn summarizes Bonger's initial words quite nicely as he writes "'until we get to policies that dismantle the system that exists, we're not going to see this stop'" (Bunn, 2022). Moving towards this equilibrium point requires sufficient reallocation of resources and time as well as educating the population based on legitimate data rather than stereotypes. Until then, the country will continue to suffer from racism, high crime rates, and a large percentage of individuals' lack of trust in the government.

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