

# Regression Analysis for Urban Crime: The Chicago Model

Saradindu Dolui <sup>1\*</sup>, Halawi Leila<sup>2</sup>

<sup>1</sup>Capitol Technology University, 11301 Springfield Rd, Laurel, MD, 20708, USA.

<sup>2</sup>Embry Riddle Aeronautical University, 1AerospaceBoulevard, Daytona Beach, FL, 32114, USA.

[https://doi.org/10.35609/gcbssproceeding.2025.1\(62\)](https://doi.org/10.35609/gcbssproceeding.2025.1(62))

---

## ABSTRACT

---

The United States, as a highly developed nation, attracts numerous immigrants seeking settlement, particularly in major urban centers like Chicago. This city faces significant challenges, with crime rates exceeding the national average, prompting police agencies to explore predictive models for forecasting criminal activity. This quantitative study examined the relationship between crime category and arrest frequency in Chicago through regression analysis. The model demonstrated strong predictive power, explaining 61.3% of the variance in arrest frequency ( $R^2 = 0.613$ ), with each unit increase in crime category corresponding to a 0.813 increase in arrests ( $p < .001$ ). The analysis confirmed the model's statistical significance ( $F = 43.780$ ,  $p < .001$ ), revealing a strong positive relationship between crime categories and arrest patterns. Findings indicate that targeted law enforcement strategies based on crime categories could significantly improve resource allocation and intervention effectiveness. The study supports implementing robust crime forecasting systems to assist police departments in identifying potential criminal activity, enabling preemptive intervention and enhancing societal well-being. These predictive technologies could help bridge the technological gap between sophisticated criminal operations and law enforcement capabilities, improving crime control effectiveness throughout Chicago's diverse communities.

JEL Codes: K42, R11, C53

**Keywords:** *Regression Analysis, Crime, Chicago, Prediction Model, Crime Prevention.*