

Economics Seminar Paper

How does unemployment affect crime rates in Brazil?

Naomi Budet Halpern - 347450165

naomi.budethalpern@post.runi.ac.il

Yael Rachel Krybus Chalom - 230390205

yaelrachel.krybusch@post.runi.ac.il

Table of Contents:

Abstract.....	3
Introduction.....	3
Literature Review.....	4
Methodology.....	7
a. Database and Research Method.....	7
b. Data.....	10
Results.....	12
Conclusion.....	16
Bibliography.....	17

Abstract

This paper examines the relationship between unemployment and crime in Brazil using panel data from all 27 states between 2012 and 2023. Relying on Becker's (1968) economic theory of crime and building on Edmark's (2005) empirical framework, we estimate a log-log fixed effects model to assess the elasticity of crime with respect to unemployment. The analysis focuses on both property crimes and intentional lethal violent crimes, controlling for income, education, divorce rates, population density, and youth demographics. Results show that a 1% increase in unemployment is associated with a 0.76% increase in aggregate property crime, with vehicle robbery being the most responsive category. No statistically significant effect is found for violent crime. These findings emphasize the importance of labor market conditions in shaping crime patterns across Brazil.

Introduction

Unemployment is widely recognized as a key indicator of macroeconomic performance and social vulnerability, as it reflects both the efficiency of labor markets and broader structural conditions within an economy (Öner, 2012; OECD, 2024). It is typically defined as the proportion of individuals who are not working but are actively seeking and available for employment, a measure that provides insights into both cyclical economic trends and deeper socio-economic disparities (International Labour Organization, 2025; World Bank, n.d). In the first quarter of 2021, Brazil recorded an unemployment rate of 14.9 percent (IBGE, 2021), representing nearly 15 million individuals without work, more than twice the OECD average of 6.7 percent during the same period (OECD, 2021). At the same time, Brazil exhibits persistently high levels of criminal activity, as reflected in international crime indices. In 2024, the country ranked 13th in the global Crime Index, underscoring the urgency of addressing violence as both a social and economic challenge (World Population Review, 2024).

This paper investigates the causal relationship between unemployment and crime in Brazil, building on existing literature that links job loss to increased criminal activity (Becker, 1968; Edmark, 2005). Understanding this relationship is critical for designing policies to address underlying economic drivers of criminal behavior (Britto, Pinotti, & Sampaio, 2022).

The theoretical foundation for this inquiry is grounded in Becker's (1968) rational choice model of crime, which suggests that individuals weigh the costs and benefits of criminal behavior. Empirical studies have reinforced this framework. Edmark (2005) identified a positive relationship between unemployment and property crime in Sweden, and Huang and Huang (2015) reported similar findings across European nations. In Brazil, Britto et al. (2022) found that job loss increased the probability of criminal prosecution by 23 percent, although this effect was moderated by access to unemployment insurance. Further support comes from Dix-Carneiro et al. (2018), who used Brazil's trade liberalization as a natural experiment and showed that regional economic shocks, especially those affecting employment, significantly influenced crime patterns. Together, these studies highlight the relevance of labor market conditions in shaping criminal behavior.

To examine this relationship within Brazil, the study employs a log-log fixed effects regression model using panel data from all 27 Brazilian states over the period 2012 to 2023. The analysis focuses on two key categories of crime: property crimes and intentional lethal violent crimes. Control variables include per capita income, level of education, divorce rates, population density, and youth demographics, all of which may influence crime patterns. The hypothesis is that unemployment has a strong positive effect on property crime, while its impact on violent crime may be less significant or more context-specific.

By identifying and quantifying the connection between unemployment and crime, this paper contributes to a deeper understanding of how labor market instability influences social outcomes in Brazil. The findings offer empirical evidence on the role of employment dynamics in influencing criminal behavior, particularly within the context of persistent regional disparities and economic vulnerability. This research enriches the existing literature by presenting a comprehensive state-level analysis over more than a decade, highlighting important patterns and associations that can inform future academic work on the socio-economic determinants of crime.

Literature Review

Several studies such as those by Becker (1968), Edmark (2005), Huang and Huang (2015), Dix-Carneiro et al. (2018) and Britto et al. (2022) have analyzed the impact of unemployment on crime rates for various locations, however, research about Brazil is relatively

scarce. Typically, economists have found that high unemployment rates have a positive effect on crime, meaning that high unemployment rates lead to higher crime rates.

The economist Gary Becker (1968) was the first to introduce the concept of the economics of crime, proposing that individuals weigh the costs and benefits of committing crimes. In contexts where legitimate opportunities are scarce, such as in periods of high unemployment, the perceived costs of crime are reduced, making it a more attractive alternative. This theoretical framework has motivated a wide range of empirical studies seeking to quantify the relationship between labor market conditions and crime rates.

Edmark (2005) provides a robust framework for understanding this relationship, examining the effect of unemployment on property crimes in Sweden using panel data and fixed-effects models. The study finds that a 1 percent increase in the unemployment rate leads to a 0.11 percent increase in aggregate property crime. The impact on violent crimes, however, is negligible. This model carefully controls for fixed state-level characteristics and time shocks, and although developed for a different context, it serves as a methodological foundation for our analysis on Brazil's socio-economic landscape.

Furthermore, Huang and Huang (2015) extend this line of research by exploring unemployment's impact on crime in Europe using a two-stage least squares (2SLS) regression model to address endogeneity. Their findings reveal that a one-percentage-point increase in unemployment leads to an approximately 9% increase in property crimes on average, with this effect being particularly pronounced in Economic and Monetary Union (EMU) countries. In contrast, violent crimes show little to no correlation with unemployment, found by Edmark (2005) as well. Together, these studies provide robust support for a positive unemployment and property crime link, yet both are geographically focused on developed economies.

Lin (2008) contributes further to this empirical discussion by examining the impact of unemployment on crime across U.S. states between 1974 and 2000. Using a fixed-effects panel regression framework similar to Edmark (2005), the study finds a significant and positive relationship between unemployment and property crimes, a 1% increase in the unemployment rate is associated with a 2.6% increase in property crime. Importantly, the analysis distinguishes between types of crime, showing that violent crimes such as homicide and assault exhibit weaker

or statistically insignificant associations with labor market fluctuations. These results support the economic theory of crime by emphasizing the role of opportunity costs, and they reinforce the hypothesis that property crimes are more sensitive to economic incentives than violent crimes. Lin's methodological approach and findings offer a useful comparative reference for this paper's focus on Brazil, particularly in terms of interpreting differential effects by crime category.

In the Brazilian context, Britto et al. (2022) use individual-level administrative data to examine how formal job loss affects the likelihood of criminal prosecution. They find that losing a formal job increases an individual's probability of being prosecuted for a crime by 23%. However, this effect is reduced by 21% during periods when the individual receives unemployment insurance, indicating that income support plays a significant protective role. These findings highlight how financial instability following job loss can increase the risk of criminal behavior and underscore the importance of social safety nets in mitigating these pressures.

From a macroeconomic perspective, Dix-Carneiro et al. (2018) examine the effects of trade-induced labor market shocks on crime in Brazil by exploiting regional variation in exposure to the country's 1990s trade liberalization. Using a difference-in-differences approach and panel data on 411 micro-regions, they find that areas more affected by employment losses experienced persistent increases in violent crime, particularly homicides. This contrasts with earlier studies such as Edmark (2005) and Huang and Huang (2015), which found no significant effect of unemployment on violent crime. While the analysis focuses on homicides due to data limitations, the study offers causal evidence linking macroeconomic shocks to crime. It highlights the need to explore broader crime categories in more recent contexts, which the present paper addresses.

Together, these studies provide a nuanced understanding of the unemployment crime relationship. Most international literature emphasizes a strong positive relationship between unemployment and property crime, with mixed or minimal effects on violent crime. Brazilian studies reveal that this dynamic may be more complex, with crime elasticity potentially amplified by weak social protections, persistent inequality, and local structural conditions (Britto et al., 2022; Dix-Carneiro et al., 2018).

Building on these studies, our research applies Edmark's methodology to analyze the relationship between unemployment and crime across Brazilian states from 2012 to 2023. By incorporating socio-demographic variables, this study seeks to provide a comprehensive understanding of the elasticity of crime with respect to unemployment in Brazil, contributing to the existing literature on this topic.

Methodology

a. Database and Research Method

To investigate the relationship between unemployment and crime in Brazil, this study adopts a quantitative approach using panel data analysis. Based on the framework developed by Edmark (2005), it employs a log-log fixed effects regression model to estimate the elasticity of crime rates with respect to unemployment, that is the percentage change in the crime rate resulting from a 1% change in the unemployment rate. In addition to unemployment, the model includes a set of socio-demographic and economic control variables described in Table 1. These variables help isolate the specific effect of unemployment on crime by accounting for alternative structural and social factors known to influence criminal behavior.

The baseline regression model is structured as follows:

$$\ln(CR_{it}) = \beta_1 \ln(U_{it}) + \beta_2 \ln(W_{it}) + \beta_3 \ln(educ_{it}) + \beta_4 \ln(div_{it}) + \beta_5 \ln(pop.dens_{it}) + \beta_6 \ln(male.14.24_{it}) + \alpha_i + t_t + \epsilon_{it}$$

The key coefficient of interest is β_1 , which captures the elasticity of crime with respect to unemployment. A positive and statistically significant β_1 would suggest that higher unemployment rates are associated with increases in crime, consistent with the economic theory of crime.

An initial issue encountered in applying Edmark's full model was the absence of data for the police clear-up rate (proportion of crimes solved), which had been used in the original Swedish context to account for the perceived risk of punishment. Due to the lack of publicly available data for Brazil, this variable had to be excluded, which may limit the ability to fully capture the effectiveness of law enforcement in discouraging criminal behavior. Additionally, we

were unable to include variables such as the proportion of foreign citizens, recipients of social welfare benefits, and per capita alcohol sales (liters), all of which were incorporated in Edmark's study. These variables are not reported with sufficient spatial granularity for Brazil and are thus excluded from our analysis. Nonetheless, other control variables, such as education level, divorce rates, and population density serve as structural and social proxies relevant to criminal activity.

To comprehensively assess the relationship between unemployment and crime, this study estimates five separate regressions based on variations of the baseline model. The first specification examines aggregate property crime, combining all reported categories of robbery, including vehicle, cargo, financial institution, street, residential, and commercial robbery. However, due to missing data for some of these categories in 2014 and 2015, this model omits those two years from the analysis.

To ensure comparability across the full period of interest (2012–2023), three additional models focus on specific types of property crime, vehicle robbery, cargo robbery, and financial institution robbery, which are available for all states and years in the sample. This disaggregated approach provides a more detailed understanding of how unemployment influences distinct forms of economically motivated crime.

The final regression investigates intentional lethal violent crime, which includes homicides, robbery-homicides, and assault followed by death. This model enables a comparison between the economic drivers of property crime and the dynamics behind violent offenses, which may follow different causal pathways.

Following Edmark's (2005) classification, this study treats robbery as a property crime, despite its potential for violent behavior. This categorization is based on the underlying motive: robbery is typically driven by economic gain, rather than violence for its own sake. Edmark (2005) argues that, from an economic perspective, robbery aligns more closely with property crimes like theft or burglary because it is responsive to changes in opportunity costs. While many studies adopt institutional definitions that classify robbery as a violent crime (Gould et al., 2002, 2002; Lin, 2008; Raphael & Winter-Ebmer, 2001), this paper follows a theoretically grounded approach aligned with the economics of crime framework developed by Becker (1968), prioritizing motive over means in categorizing offenses.

Table 1

Variable Name	Label	Unit	Description
lethal_violent_crime_rate	Intentional Lethal Violent Crimes Rate	Per 100,000 people	Rate of intentional lethal violent crimes, including intentional homicide, robbery-homicide, and assault followed by death.
property_crimes_rate	Total Robbery Rate	Per 100,000 people	Aggregate rate of all reported robbery incidents, including vehicle, cargo, financial institution, commercial, residential, and street robberies.
robbery_rate_vehicle	Robbery of Vehicles Rate	Per 100,000 people	Robbery incidents involving motor vehicles
robbery_rate_cargo	Robbery of Cargo Rate	Per 100,000 people	Robbery incidents involving transported goods or cargo
robbery_rate_financial	Robbery of Financial Institutions Rate	Per 100,000 people	Robbery incidents targeting banks or financial entities
U	Unemployment Rate	Percent (%)	Annual average unemployment rate per state (mean of four trimesters).
W	Average Monthly Income	Brazilian Real (R\$)	Average monthly income per person in each state.
educ	Higher Education Rate	Per 100,000 people	Number of residents with completed higher education or equivalent

div	Divorce Rate	Per 100,000 people	Annual number of divorces granted in first instance court rulings or by notarial deed, per 100,000 people.
pop.density	Population Density	People per km ²	State population divided by land area
male.14.24	Male 14-24	Per 100,000 people	Number of male individuals aged 14–24 per 100,000 population
State_fe (α)	State Fixed Effects	—	Controls for time-invariant unobserved characteristics of each state
Year_fe (t)	Year Fixed Effects	—	Controls for national shocks and time-specific influences

b. Data

The dataset comprises annual data from all 27 Brazilian states covering the period 2012 to 2023. Labor market indicators, income levels, and education attainment were obtained from the Continuous National Household Sample Survey (PNADC), conducted by the Brazilian Institute of Geography and Statistics (IBGE). Divorce data were retrieved from IBGE’s judicial registry statistics, and population density was calculated using IBGE’s official land area figures and annual population estimates based on demographic projections.

Crime data were sourced from the Brazilian Forum on Public Security (Fórum Brasileiro de Segurança Pública, n.d.), specifically from its annual public security yearbooks. These publications provide standardized crime indicators across all states and years, ensuring consistency and comparability across regions and time periods.

Each variable included in the model is grounded in the existing empirical literature on crime and its socio-economic determinants. Unemployment, income, and education are routinely incorporated into economic models of crime, as shown in foundational work by Becker (1968),

Edmark (2005), and more recent studies such as Britto et al. (2022). These variables capture the opportunity cost of engaging in criminal activity and the general level of socio-economic opportunity. To capture social dynamics, divorce rates serve as an indicator of family instability, while population density reflects urbanization, which affects both crime rates and public safety. All variables were chosen based on their relevance in the literature and the availability of consistent, comparable data across states and over time.

The Table 2 below presents the summary statistics of the main variables used in the regression model. These will provide an overview of the central tendencies and variations across the dataset.

Table 2

Variable	Average	Standard deviation	Min	Max	Expected sign
Unemployment Rate	0.1038681	0.03731	0.029000	0.20375	+
Population Density	74.7378837	116.56423	1.903692	550.00000	+
Higher Education Rate	9,434.2815152	3,882.26114	2,904.227017	26,546.71717	-
Average Monthly Income	2,607.4567901	714.25266	1,497.000000	5,347.00000	+/-
Divorce Rate	278.7120166	754.35681	3.357604	4,496.90284	+
Male 14-24	9,475.8124702	1,045.25573	6,931.534799	12,482.66297	+

Results

This section presents the results of fixed effects regression models estimating the relationship between unemployment and different types of crime in Brazil. The analysis focuses on two crime categories: property crime, both as an aggregate indicator and in disaggregated form, and intentional lethal violent crime. All models include state and year fixed effects and control for average income, education attainment, divorce rates, population density, and the proportion of males aged 14 to 24.

Table 3 reports estimates for four models of property crime. The first column presents results for aggregate property crime, which includes a wide set of robbery related offenses: vehicle, cargo, financial institution, residential, commercial, and street robbery. While this specification captures a comprehensive view of economically motivated crime, it excludes two years (2014–2015) due to missing data for certain subcategories.

To ensure comparability across the full time period, the next three columns present disaggregated models focusing on vehicle robbery, cargo robbery, and financial institution robbery, only categories with complete and comparable data for all states from 2012 to 2023. This approach enables a more focused examination of unemployment's impact on specific subtypes of property crime.

The aggregate property crime model reveals a strong and statistically significant relationship: a 1% increase in the unemployment rate is associated with a 0.76% increase in property crime ($p < 0.001$). This elasticity is nearly seven times higher than that found in Edmark's (2005) study of Sweden (0.11%) and highlights the vulnerability of Brazil's labor market to criminal spillovers. The result supports the theoretical expectation that declining economic conditions increase the relative payoff of criminal activity (Becker, 1968).

Among the disaggregated models, vehicle robbery shows the most statistically significant response to unemployment. A 1% increase in unemployment leads to a 0.49% increase in vehicle robbery ($p < 0.001$), indicating that this form of crime is particularly sensitive to short-term economic shocks. This finding aligns with Edmark's (2005) study in Sweden, which also identified car theft as one of the most responsive types of property crime to rising unemployment. Vehicle-related crimes may be more directly influenced by individual economic

incentives, as they often require less coordination and offer immediate financial returns compared to more organized forms of robbery (Longman, 2006).

Table 3

Variable	Property.Crime	Vehicle Robbery	Cargo Robbery	Financial Robbery
Unemployment Rate	0.763319*** (0.135024)	0.48942*** (0.13478)	0.608409* (0.262311)	0.311850 (0.393404)
Average Monthly Income	0.934011 (0.589136)	0.50540 (0.56320)	2.107386** (0.751022)	-3.109233 (1.643871)
Higher Education Rate	-0.237624 (0.247407)	-0.20100 (0.28263)	-0.738957 (0.418306)	-2.066424* (0.835430)
Divorce Rate	-0.022321 (0.104937)	-0.40471*** (0.10678)	-0.351152*** (0.099066)	0.027755 (0.311655)
Population Density	-0.154065 (1.341949)	-10.69727*** (1.97819)	0.415662** (0.130687)	-22.419451*** (5.773929)
Male 14–24	0.222237 (0.634521)	-0.15304 (0.65947)	1.888282 (1.198357)	2.614679 (1.924860)
Observations	214	206	204	206
Adjusted R ²	0.049788	0.23566	0.20486	0.4681

Notes: Robust standard errors in parentheses; Coefficients are statistically significant at the ***0.1% level ($p < 0.001$), **1% level ($p < 0.01$), *5% level ($p < 0.05$), and .10% level ($p < 0.1$). Fixed effects and year dummies are included in all regressions.

Additionally, the regression results indicate a statistically significant and positive association between unemployment and cargo robbery, with a 1% increase in the unemployment

rate corresponding to a 0.61% rise in cargo theft ($p < 0.05$). While cargo crimes are often attributed to organized groups, this finding is consistent with Ceccato et al. (2023), who demonstrate that unemployment significantly increases cargo theft in São Paulo. Their study highlights the role of economic vulnerability and labor informality in facilitating such crimes. This supports the interpretation that cargo robbery in Brazil is not solely driven by organized crime but is also sensitive to broader labor market conditions.

By contrast, financial institution robbery shows no statistically significant relationship with unemployment, suggesting that such crimes may be more influenced by organized criminal groups or institutional targeting strategies, rather than by general labor market conditions (Samavati, 2006).

One important aspect to acknowledge is the relatively low adjusted R^2 in the property crime model. This outcome is not unusual in crime research and can be attributed to the fact that criminal activity is influenced by a broad range of factors beyond unemployment and the limited control variables included. Elements such as police presence, social policies, local economic disparities, and underreporting of crimes all play a role, (Kelly, 2000; Soares, 2004), yet were not captured in the dataset. Additionally, inaccuracies in crime reporting may introduce measurement error, further reducing the model's explanatory power (Levitt, 1995). Despite these limitations, the unemployment coefficient remains statistically significant, supporting the link between economic distress and property crime.

Table 4 reports the results for intentional lethal violent crime, which includes homicides, robbery-homicides, and assault followed by death. In this model, the coefficient on unemployment is positive but not statistically significant ($p = 0.20$). This finding is consistent with Edmark's (2005) study and broader empirical literature suggesting that violent crime is less directly influenced by short-term economic fluctuations than property crime.

Violent crimes are often associated with interpersonal conflict, organized criminal activity, and systemic factors such as drug trafficking and firearm availability, which may not respond to labor market changes in a linear or immediate way (Juárez et al., 2020; Cook, 1983; Raphael & Winter-Ebmer, 2001). Although it is plausible that long-term structural

unemployment may contribute to violence through accumulated social stress and disintegration, this effect is not captured in the current model (Nordin & Almén, 2016).

Table 4:

Variable	Violent Crime
Unemployment Rate	0.089311 (0.069414)
Average Monthly Income	0.101145 (0.318291)
Higher Education Rate	-0.247994 (0.135072)
Divorce Rate	-0.123288* (0.055163)
Population Density	0.020638 (0.729570)
Male 14–24	0.989998** (0.348836)
Observations	269
Adjusted R ²	0.010213

Notes: Robust standard errors in parentheses; Coefficients are statistically significant at the ***0.1% level ($p < 0.001$), **1% level ($p < 0.01$), *5% level ($p < 0.05$), and .10% level ($p < 0.1$).. Fixed effects and year dummies are included in all regressions.

Conclusion

This paper finds a strong and statistically significant link between unemployment and property crime in Brazil. A 1% increase in unemployment is associated with a 0.76% rise in property crime, with vehicle and cargo robbery showing the most sensitivity to labor market fluctuations. In contrast, no significant effect is found for violent crime. These results support the economic theory of crime, suggesting that individuals respond to deteriorating economic conditions by engaging in financially motivated offenses.

These findings imply that crime prevention in Brazil should not rely solely on policing, but must also address the structural economic conditions that contribute to criminal behavior. As shown by Britto et al. (2022), even temporary income support through unemployment insurance can mitigate the likelihood of criminal prosecution. Policies that promote employment, expand education access, and enhance social protections may reduce crime not only by improving income security, but also by raising the opportunity cost of illegal activity, as originally proposed by Becker (1968) and reinforced by Edmark (2005).

Finally, the analysis is constrained by data limitations, particularly the absence of certain explanatory variables that are likely relevant to crime dynamics, such as policing intensity, social assistance coverage, and informal labor conditions. Future research could benefit from disaggregating crime data by gender and age or expanding the time horizon, which may offer a more detailed understanding of how unemployment affects different population groups and crime types across Brazilian states, as well as incorporating additional variables to improve the explanatory power of the models.

Bibliography

- Becker, G. S. (1968). Crime and Punishment: an economic approach. *Journal of Political Economy*, 76(2), 169–217. <https://doi.org/10.1086/259394>
- Britto, D. G. C., Pinotti, P., & Sampaio, B. (2022). The effect of job loss and unemployment insurance on crime in Brazil. *Econometrica*, 90(4), 1393–1423. <https://doi.org/10.3982/ecta18984>
- Ceccato, V., Aransiola, T. J., & Justus, M. (2023). *Space-time dynamics of cargo theft: Evidence from São Paulo, Brazil*. Journal of Transportation Security. Retrieved from <https://www.diva-portal.org/smash/get/diva2:1784914/FULLTEXT01.pdf>
- Cook, P. J. (1983). The influence of gun availability on violent crime patterns. *Crime and Justice*, 4, 49–89. <https://doi.org/10.1086/449086>
- Dix-Carneiro, R., Soares, R. R., & Ulyssea, G. (2018). Economic Shocks and Crime: Evidence from the Brazilian Trade Liberalization. *American Economic Journal Applied Economics*, 10(4), 158–195. <https://doi.org/10.1257/app.20170080>
- Edmark, K. (2005). Unemployment and crime: is there a connection? *Scandinavian Journal of Economics*, 107(2), 353–373. <https://doi.org/10.1111/j.1467-9442.2005.00412.x>
- Fórum Brasileiro de Segurança Pública. (n.d.). *Anuário Brasileiro de Segurança Pública*. <https://forumseguranca.org.br/publicacoes/anuario-brasileiro-de-seguranca-publica/>
- Gould, E. D., Weinberg, B. A., & Mustard, D. B. (2002). Crime rates and local labor market opportunities in the United States: 1979–1997. *The Review of Economics and Statistics*, 84(1), 45–61. <https://doi.org/10.1162/003465302317331919>
- Huang, L. H., & Huang, Y. T. (2015). Impact of Unemployment on Crime in Europe. *Romanian Economic Journal*, 18(57).
- IBGE. (n.d.). *PNAD Contínua*. <https://painel.ibge.gov.br/pnadc/>
- IBGE. (2021). *PNAD Contínua - Taxa de Desocupação*. <https://www.ibge.gov.br/estatisticas/sociais/trabalho/9173-pesquisa-nacional-por-amostra>

-de-domicilios-continua-trimestral.html?=&t=series-historicas&utm_source=landing&utm_medium=explica&utm_campaign=desemplego

International Labour Organization. (2025). *Unemployment rate*. ILOSTAT.

<https://ilostat.ilo.org/data/snapshots/unemployment-rate/>

Juárez, N. C., Urdal, H., & Vadlamannati, K. C. (2020). The significance of age structure, education, and youth unemployment for explaining subnational variation in violent youth crime in Mexico. *Conflict Management and Peace Science*, 39(1), 49–73.

<https://doi.org/10.1177/0738894220946324>

Kelly, M. (2000). Inequality and crime. *The Review of Economics and Statistics*, 82(4), 530–539.

<https://doi.org/10.1162/003465300559028>

Levitt, S. (1995). *Why do increased arrest rates appear to reduce crime: deterrence, incapacitation, or measurement error?* <https://doi.org/10.3386/w5268>

Lin, M. J. (2008). Does unemployment increase crime?: Evidence from US Data 1974–2000. *Journal of Human Resources*, 43(2), 413–436.

Longman, M. (2006). The problem of auto theft. In *Elsevier eBooks* (pp. 1–21). <https://doi.org/10.1016/b978-012088486-5/50034-x>

Nordin, M., & Almén, D. (2016). Long-term unemployment and violent crime. *Empirical Economics*, 52(1), 1–29. <https://doi.org/10.1007/s00181-016-1068-6>

OECD. (2021). *Unemployment rate*.

<https://www.oecd.org/en/data/indicators/unemployment-rate.html>

OECD. (2024). *Unemployment rate*.

<https://www.oecd.org/en/data/indicators/unemployment-rate.html>

Öner, C. (2012, February 1). *Unemployment: The Curse of Joblessness*. Finance & Development | International Monetary Fund.

<https://www.imf.org/external/pubs/ft/fandd/basics/unemploy.htm>

- Raphael, S., & Winter-Ebmer, R. (2001a). Identifying the effect of unemployment on crime. *The Journal of Law and Economics*, 44(1), 259–283. <https://doi.org/10.1086/320275>
- Raphael, S., & Winter-Ebmer, R. (2001b). Identifying the effect of unemployment on crime. *The Journal of Law and Economics*, 44(1), 259–283. <https://doi.org/10.1086/320275>
- Samavati, H. (2006). Economics of Crime: Panel Data analysis of bank robbery in the United States. *Atlantic Economic Journal*, 34(4), 455–466.
<https://doi.org/10.1007/s11293-006-9033-y>
- Soares, R. R. (2003). Development, crime and punishment: accounting for the international differences in crime rates. *Journal of Development Economics*, 73(1), 155–184.
<https://doi.org/10.1016/j.jdeveco.2002.12.001>
- World Bank. (n.d.). *Metadata Glossary*. DataBank.
<https://databank.worldbank.org/metadataglossary/world-development-indicators/series/S.L.UEM.TOTL.ZS>
- World Population Review. (2024). *Crime rate by country*.
<https://worldpopulationreview.com/country-rankings/crime-rate-by-country>
- 黃羽慈, & Huang, Y. (2015a). Impact of unemployment on crime in Europe. *DOAJ (DOAJ: Directory of Open Access Journals)*.
<https://doaj.org/article/60fbb9dded7c45aeb25da40f7aa2a2b8>