BerkeleyHaas

April 18, 2023

Cover Letter
Review of Economics and Statistics Fellowship for NBER Summer Institute

Dear Committee, below is the required information for the Application to the Review of Economics and Statistics Fellowship for NBER Summer Institute 2023.

Name: Joaquin A. Urrego
Email: jaurrego@berkeley.edu
University affiliation: Haas School of Business, University of California – Berkeley
Date of Ph.D.: December 2021
Personal website: www.jaurrego.com
Summer Institute sessions of interest: Law and Economics, Urban Economics, and Development Economics.

Current Research Activity:

I am an urban economist with a particular focus on the economics of crime, spatial analysis, and development. Broadly, my research uses urban theory and GIS analysis to understand how the built environment and neighborhood amenities explain different spatial patterns of informal housing, crime rates, commercial rents, and police activity.

In my most active current project, I combine satellite images with neural networks to study the lifecycle of slums in Chile. This is a joint project with Prof. Paul Gertler (UC Berkeley), Prof. Marco Gonzales-Navarro (UC Berkeley), and Prof. Raimundo Undurraga (Universidad de Chile). Using satellite images for the last two decades, we document the evolution of informal settlements before and after each of them is officially labeled as a slum by the Chilean government. We use machine learning to identify building structures inside and outside slum borders. This novel dataset provides yearly building density at small geographical units that are then matched with geocoded socioeconomic variables to control for macroeconomic conditions and local labor markets. Preliminary results suggest that (i) informal

settlements are more prevalent in areas where nearby building density is high (ii) neighborhoods within 100 meters of a slum's border seem to respond to the expansion and contraction of the slum, however, this response appears to be a function of the slum size (iii) the success of government interventions to eradicate slums are correlated with low building density and small original slum size.

On the interaction between Police and Minority populations, I am studying the influence that crowds have on police behavior when stopping minority individuals and how the perception of disparate treatment by the police increases the probability that minority-owned businesses fail. Under NYC Stop-Question-Frisk (SQF) policy, police officers are less likely to use physical force when there are more witnesses. However, the effect vanishes if the person stopped belongs to a minority group or the nearby crowd is predominantly minority. I also find that perceptions of police bias have enduring detrimental effects on attitudes even after evidence that police bias has diminished. Small firms are also more likely to exit the market if they operate in neighborhoods with low arrest rates and higher rates of unjustified police use-of-force for minorities.

In the area of spatial patterns of crime and police activity, one of my current working papers considers the potential of urban planning to reduce criminal activity and free up public resources allocated to police patrolling. This paper, "Eyes on the Street, Spatial Concentration of Retail Activity and Crime," is joint with Prof. Stuart Rosenthal (Syracuse University). We show that if spatial concentration of retail activity amplifies the effect of "eyes on the street," this should lower neighborhood crime rates and reduce investment in anti-crime measures, with benefits capitalized into higher retail rent. We use point-specific data for New York City (NYC) to support our predictions: a one standard deviation increase in retail concentration reduces property crime by 8.5%, police stops by 11%, and causes retail rent to increase by at least 7.8%.

Sincerely,

Joaquin A. Urrego
Postdoctoral Scholar
Haas School of Businesses, UC Berkeley

JOAQUIN A. URREGO

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Summary

- Joaquin A Urrego is a Postdoc at the University of California - Berkeley. He works at the Haas School of Business and holds a Ph.D. in Economics from Syracuse University. His fields are Urban Economics and Applied Econometrics. His research uses GIS analysis to understand how the built environment and neighborhood amenities explain different spatial patterns of informal housing, crime rates, commercial rents, and police activity. Some of his current research applies modern analytical tools like Machine Learning to study the impacts and spillovers of slums, and racial differences in police behaviour.

Research Fields

- Urban Economics, Economics of crime, Spatial Econometrics, and Development.

EDUCATION

Ph.D.	Economics	Syracuse University	2017 - 2022
Dissertation:	Urban Economics, Commercial Activity and Crime		
M.Sc.	Economics	Universidad EAFIT	01/2015-12/2015
B.Sc.	Economics (Quantitative Analysis)	Universidad EAFIT	01/2010-07/2014

APPOINTMENTS

- Postdoctoral scholar, Haas School of Business, **University of California - Berkeley**, 2/2022 - Present
- Graduate Associate, Center for Policy Research (CPR), **Syracuse University**, 06/2018 - 08/2021
- Research Analyst **The World Bank**, 09/2014 - 07/2017

PAPERS

- Rosenthal, S.; Strange, W.; and Urrego, J.A. (2022). "Are City Centers Losing Their Appeal? Commercial Real Estate, Urban Spatial Structure, and COVID-19". *Journal of Urban Economics*, JUE-Insights, 127.
- Pena, P.; Urrego, J.A.; and Villa, J. (2017). "Civil Conflict and Conditional Cash Transfers: Effects on Demobilisation". *World Development*, 99, 431-440.
- Canavire-Bacarreza, G.; Urrego, J.A.; and Saavedra, F. (2017). "Informality and Mobility in the Labor Market: an analysis based on repeated cross-sectional household survey data". *Latin American Journal of Economic Development*, 27, 57-76.
- Urrego, J.A.; Gomez, C.; Velasquez, H.; and Valderrama, J. (2016). "Efecto de los ingresos permanentes sobre el delito: un enfoque espacial y un caso de aplicación". *Revista Investigación Económica*, 75(298), pag.: 115-153.
- Bonet, J.; Guzman, K.; Urrego, J.A. and Villa, J. (2014). "Efectos del nuevo Sistema General de Regalías sobre el desempeño fiscal municipal: un análisis dosis-respuesta". *Revista del Banco de la República*, 1040, pag.: 15-40.

WORKING PAPERS

- Urrego, J.A. (2023). "Perceptions of Police Bias and the Location of Minority-Owned Establishments". Available here.
- Rosenthal, S. and Urrego, J.A. (2022). "Eyes on the Street, Spatial Concentration of Retail Activity and Crime". Available here.
- Canavire-Bacarreza, G.; Duque, J.; and Urrego, J. (2016). "Moving Citizens and Deterring Criminals: Innovation in Urban transport facilities". *CAF - Working Papers*, num. 2016/15, CAF, Argentina. Available here.
- Bonet, J. and Urrego, J. (2014). "El Sistema General de Regalías: ¿mejoró, empeoró o quedó igual?". *Documentos de Trabajo sobre Economía Regional*, num. 198, Colombia. Available here.

PAPERS IN PROGRESS

- "The Lifecycle of Slums", with Paul Gertler, Marco Gonzalez-Navarro (University of California-Berkeley), and Raimundo Undurraga (Universidad de Chile).
- "The Cost of Crime in Mexico", with Laura Chioda and Paul Gertler (University of California-Berkeley).
- "The Power of Bystanders"

ACADEMIC AWARDS

- 2022 All-University Doctoral Prize for Economics, Syracuse University.
- 2017-2021 Graduate Fellowship, Syracuse University
- 2021 Thompson-Burkhead Program Fund for the paper "Perceptions of Police Bias and the Location of Minority-Owned Establishments"
- 2016 CAF Habitat and Urban Development Research grant for the paper "Moving Citizens and Deterring Criminals: Innovation in Urban transport facilities" (10,000 USD)
- Top 5 University Students in Colombia. Premios Portafolio, Bogota, Colombia, 2014.
- Merit Scholarship: Best GPA in the Economics Department, Universidad EAFIT, Medellin, Colombia, 2011.
- Scholarship at Universidad EAFIT: Best Student in Public Schools, Medellin, Colombia, 2010.

CONFERENCES & SEMINAR PRESENTATIONS

- 16th North American Meeting of the Urban Economics Association. October 2022
- ASSA 2022 Session of AREUEA, Boston MA, USA. January 2022
- 15th North American Meeting of the Urban Economics Association. October 2021
- 10th European Meeting of the Urban Economics Association, Virtual. May 2021
- ASSA 2021 Session of AREUEA, Chicago IL, USA. January 2021
- 90th Annual Meetings - Southern Economic Association (SEA), New Orleans LA, USA. November 2020
- ASSA 2020, San Diego CA, USA. January 2020
- X Meeting Impact Evaluation Network of LACEA, Washington D.C., USA. March 2017
- XXI Annual Meeting of the Latin American and Caribbean Economic Association (LACEA), Medellin, Colombia. November 2016
- CAF Workshop: Habitat and Urban Development, Buenos Aires, Argentina, July 2016
- 71st Annual Meeting of American Society of Criminology (ASC): The Politics of Crime and Justice, Washington D.C., USA. November 2015
- XX Annual Meeting of the Latin American and Caribbean Economic Association (LACEA), Santa Cruz, Bolivia. October 2015
- 55th Congress of the European Regional Science Association (ERSA), Lisbon, Portugal. August 2015
- 61st Annual North American Meetings of the Regional Science Association International. North American Regional Science Council (NARSC), Washington D.C., USA. Nov-2014

LANGUAGES, SKILLS

Skills/Software: GIS analyst, Stata (excellent), ArcGis (excellent), Python (excellent), MapInfo/MapBasic, (excellent), Excel (excellent), QGis (excellent), Matlab (good), Latex (good).
Languages: Spanish (Native), English (Fluent), French (Intermediate: DELF A2)

EXPERIENCE

- Consultant, Peru Climate Change Development Report (Brian Walsh). **The World Bank**, 11/2021 - 02/2022
- Consultant, Honduras Climate Change Development Report (Katharina Siegmann). **The World Bank**, 11/2021 - 02/2022
- Graduate Associate, Center for Policy Research (CPR) (Stuart Rosenthal) **Syracuse University**, 06/2018 - 08/2021
- Consultant, Environmental Global Practice - Latin America (Julian Lee) **The World Bank**, 05/2020 - 08/2020
- Research Analyst, Office of the Chief Economist - Equitable Growth, Finance, and Institutions (Laura Chioda) **The World Bank**, 04/2017 - 07/2017
- Consultant, Office of the Chief Economist - Latin America and the Caribbean Region (Laura Chioda) **The World Bank**, 09/2014 - 03/2017
- Research Assistant, City Prosperity Index (Gustavo Canavire, Juan Carlos Duque & Alejandro Torres) **Universidad EAFIT & United Nations (UN)**, 06/2014 - 08/2014
- Research Assistant, Fiscal Policy and Regional Economics. (Jaime Bonet) **Central Bank of Colombia**, 07/ 2013 - 12/2013

Other Relevant Experience

- Primary Instructor *Department of Economics - Maxwell School, Syracuse University* for ECN102: Principles of Macroeconomics. Summer 2020
- Primary Instructor *Department of Economics - Maxwell School, Syracuse University* for ECN101: Principles of Microeconomics. Summer 2019
- Peer reviewer for *Journal of Urban Economics*, *Regional Science and Urban Economics*, *Journal of Population Economics*, *Journal of Housing Economics*, *Latin American Economic Review*, *Journal of Urban Planning and Development*, and *Cities*.
- Part of The Global Good Fund Fellowship Evaluation Committee 2016-2021.

Perceptions of Police Bias and the Location of Minority-Owned Establishments*

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March 14, 2023

Abstract

Perceptions of police bias have enduring detrimental effects on attitudes even after evidence that police bias has diminished. Individuals might avoid certain areas and change their consumption patterns. Similarly, workers will adapt their preferences for location, and less desirable places will require higher wages. These effects influence the profitability of minority-owned small firms, especially if they locate in areas where police is perceived as biased. That impacts the equilibrium location of minority-owned establishments. Using data for police stops in New York City, I find that areas with low minority arrest rates back in 2012 had lower minority shares of small establishments in 2019. Small firms are also more likely to exit the market if they operate in neighborhoods with low arrest rates and higher rates of unjustified police use-of-force for minorities. The estimated effects are larger when the sample is restricted to predominantly minority neighborhoods and retail and personal services firms. These different sample designs support the idea that police bias perceptions impact local demand, reducing profits and driving minority-owned firms out of business.

JEL codes: R00, J15, K42
Keywords: Minorities, Perceptions, Police Bias, Small Establishments, Police Use of Force

* I thank Stuart Rosenthal for his advice and suggestions. Helpful comments from Alfonso Flores-Lagunes, Marco Gonzales-Navarro, William Horrace, Carl Lieberman, Paul Gertler, Amy Schwartz, Maria Zhu, and participants of the 2022 UEA Annual Meetings are greatly appreciated. An earlier version of this paper was submitted as Chapter 3 of the dissertation titled "Urban Economics, Commercial Activity, and Crime" to fulfill the requirements for the Ph.D. degree in Economics at Syracuse University. All errors are mine.

1. Introduction

Perceptions of police bias can result in long-term changes in behavior, including mobility patterns, employment decisions, and preferences over shopping and business locations. Minority entrepreneurs are susceptible to perceptions of police bias. First, they may feel personally threatened, and second, effects on customers and employees might compromise business profitability. I use pedestrian stops from the Stop-Question-Frisk (SQF) policy in New York City to study the effects of perceptions of police bias on the location and success rate of minority-owned small businesses. I find that perceptions have a long-lasting effect on Minority entrepreneurs even when evidence of police bias has diminished.[1]

Small establishments account for a significant part of the economy, and those minority-owned are the most likely to respond to local neighborhood shocks. Establishments with less than 10 workers account for 73% of all US businesses (CBP, 2019), and of those, approximately 20% are minority-owned (SBO, 2012; Toussaint-Comeau and Williams, 2020). Small businesses have limited resources to cope with macro and local shocks due to credit constraints, financial obligations, and human capital.[2]

Police behavior and perceptions of bias will significantly affect the location and success of small minority-owned establishments due to their impact on profitability. Assuming competitive markets and the decision to open a business given, changes in customers' and workers' attitudes prompted by perceptions of police bias will affect the profit function. Lower sales are expected if shoppers avoid areas where Police are perceived as biased, especially if

[1] Minorities refer to populations other than White non-Hispanic. The words businesses, firms, establishments, and companies are use interchangeable for presentational purposes. Although there is a clear difference between establishments and firms/companies, this paper focuses on single-site small firms for which the semantic difference is insignificant.

[2] See Efrat (2008), Decker et al. (2014), Farrell et al. (2018), Tian (2018), and Farrell et al. (2019).

business owners cannot compensate for the risk with lower prices. Employees will require higher compensation for working in neighborhoods where they feel unsafe. This is particularly relevant for minority-owned businesses because they are more likely to operate in Minority communities. Together, these effects suggest that in equilibrium low Minority share of establishments prevails in locations where perceptions of police bias are high.[3]

The SQF policy has been criticized for allegations about police disparate treatment against Minorities, particularly before 2013. During 2006 and 2012, the Police stopped almost half a million Minority individuals every year, and only 6% of those stops resulted in an arrest. Additionally, the percentage of non-arrest stops that involved police use of force was around 20%. Although this is not proof of police bias, it does contribute to individuals' perceptions of Minority disparate treatment, 1 out of 5 Minority individuals stopped by the Police without enough evidence for an arrest experienced physical force by police officers.

This paper focuses on perceptions of police bias and does not aim to test police disparate treatment in the SQF policy. I define two widely used measures that capture the success rate of police stops and are directly linked to citizens' perceptions of police behavior. These are the arrest rate and the force rate, which is calculated as the percentage of non-arrest stops that involve physical force. The arrest rate captures the police's ability to correctly identify individuals with a warrant or involved in criminal activity, while the force rate shows the propensity to use force when there is limited evidence for an arrest. High Minority arrest rates and low force rates will be associated with lower perceptions of police bias. [4]

[3] There are also idiosyncratic costs from business owners due to their personal propensity to avoid Police.
[4] Determining whether police behavior is biased depends on many factors that are hard to observe. Previous research has focused on arrest rate and force rate to provide evidence of heterogeneous effect from different policing strategies (Holz et al., 2019; Knowles et al.; 2001; Kramer and Remster, 2018; Legewie, 2016).

This paper combines point-specific data on police stops provided by the New York Police Department (NYPD) with establishments data from Dun & Bradstreet (D&B). Data on police stops include demographic characteristics of the stopped individual and indicators if an arrest was made or if the Police exerted any type of physical force. D&B data provides the location, industry, and employment of more than a million establishments in NYC. This dataset includes an indicator of whether the business is minority-owned or not. However, this indicator has some limitations that only allow identifying some minority-owned firms (see discussion in section 2). To overcome that, I use establishment' executives' last names to predict whether they belong to a Minority group. This sample of predicted minority-owned firms validates the robustness of the different empirical strategies.

Results show that perceptions of police bias have a long-lasting effect on Minority entrepreneurship. Census tracks with low arrest and high force rates in 2012 have a lower Minority share of small establishments in 2019. This result is not driven by specific neighborhood characteristics, such as the propensity to open a business close to potential customers.[5] Survival models show that small establishments located in areas where Police might be perceived as biased are more likely to exit the market —this helps explain the lower share of minority-owned establishments in those locations. Comparisons across neighborhoods and industries support the link between police outcomes, customers, and business profits. Effects of perceptions of police bias are larger in predominantly Minority neighborhoods and in industries that depend heavily on nearby demand (e.g., retail).

This paper presents an idea that has yet to be considered when studying minority-owned firms, perceptions of discrimination from police behavior discourage business activity. This

[5] All specifications include an extensive array of neighborhood controls like the Minority share of population, income per capita, homeownership rate, poverty rate, population with college degree and criminal activity.

research contributes more broadly to the study of the performance of minority-owned small establishments and their success rate (Fairlie and Robb, 2007; Fairlie et al., 2020; Knaup, 2005; Robb, 2002).[6] It also speaks to the research on heterogeneous effects in policing strategies regarding Minority populations (Antonovics and Knight, 2009; Braga et al., 2021; Chalfin et al., 2022; Goncalves and Mello, 2021; Horrace et al., 2016).

Section 2 presents the data used, empirical strategy, and summary statistics. Section 3 discusses the results, while section 4 concludes.

2. Data, Empirical Strategy, and Summary Statistics

To study the link between perceptions of police bias and the location of minority-owned establishments, I consider whether the Minority share of small firms in 2019 in a given Census Track can be explained by police outcomes in 2012. Then, I construct a panel dataset of establishments to estimate differences in failure rates of small firms attributed to police behavior. The survival analysis at the firm level focuses on block perceptions of police bias (highly localized neighborhood attributes), which allow comparisons between establishments in the same Census Tract.[7]

All specifications control for neighborhood attributes obtained from the American Community Survey (ACS). I use the ACS 2014-2018 average when estimating static models and the annual ACS 2011 to 2019 when using the panel data structure. Below, I discuss the two primary datasets (police stops and establishment data) and provide some context about the Stop-Question-Frisk policy in NYC and the study sample of minority-owned establishments. I also present the empirical strategy and summary statistics at the end of this section.

[6] Results also highlight the relevance of perceptions, see Fairlie et al. (2020).
[7] Throughout the paper, the term "block" refers to Census Block Group.

2.1. Stop-Question-Frisk and Perceptions of Police Bias

The SQF policy became widely popular during Michael Bloomberg's administration (2002-2013). The number of stops went from 97,296 in 2002 to more than 500,000 in 2012.[8] However, police stops decreased dramatically after several court litigations and allegations of discriminatory behavior in 2012. Between 2012 and 2014, the number of stops declined by 90%, and by 2019 there were only 13,453 stops.

The SQF policy has motivated many discussions about police bias, but limited attention has been given to perceptions (Sewell et al., 2018; Braga et al., 2021). Previous research finds that Afro-Americans and Hispanics are stopped at a higher rate than their White counterparts, even after controlling for racial composition in the local area and estimates of crime participation by race (Evans et al., 2014; Gelman et al., 2007; Ridgeway, 2007). Other studies have focused on race as a strong predictor of SQF rates (Ferrandino, 2018; Hanink, 2013; MacDonald and Braga, 2019). However, research on how that translates into perceptions is limited. Lerman and Weaver (2014) show that witnessing stops with little justification and involving physical force seems to increase disengagement with the local government, suggesting that individuals avoid contact with officers in neighborhoods where Police can be perceived as biased.[9]

The NYPD provides the data of all SQF stops since 2006. This dataset includes the latitude and longitude of every stop and several characteristics of the stopped individual, including race and ethnicity. Individuals other than White non-Hispanic are considered

[8] Evans et al., (2014).
[9] See Drakulich and Crutchfield (2013), Reitzel. and Piquero (2006), and Rice and Piquero (2005) for further references on perceptions of police bias.

Minority.[10] The data also includes whether an arrest was made and if the Police used physical force during the stop. Force is a binary variable that indicates if police officers use their hands to restrain a suspect, push the suspect against the wall or ground, withdraw or point their weapon toward the suspect, use their baton, or use force while handcuffing.

Two measures of police behavior are considered to proxy for perceptions of police bias, the arrest rate and the force rate in non-arrest stops. The share of stops that lead to an arrest is related to police officers' ability to identify individuals who have a warrant or are involved in criminal activity. The second measure is the share of non-arrest stops involving physical force. Police are likely to be perceived as biased in locations where the arrest rate is low, and the force rate is high.[11]

Figure 1A documents changes in the SQF policy between 2006-2019. The figure provides the citywide number of stops, Minority share of stops, arrest rate, and force rate for Minorities and Whites. Although stops have decreased by more than 95% since 2012, the Minority share of stops has barely changed. Police stops made to Minorities account for approximately 90% of all citywide SQF stops at any given year.

Comparisons of SQF outcomes before and after 2013 suggest a citywide change in police behavior. Before 2013, most stops did not result in an arrest, and Minorities were more likely than Whites to experience force by the Police in non-arrest stops. After 2016, arrest rates are three times larger, with slight differences between Minority and White non-Hispanics. The gap

[10] Heterogeneous effects by specific race and ethnicity are not considered because the D&B data only provides an indicator of minority-owned business.

[11] Sewell et al. (2016) use similar indicators to show differences in mental health outcomes among males that live in NYC neighborhoods more exposed to aggressive police behavior. See also Kramer and Remster (2018) and Smith and Holmes (2014) for further references on police use of force.

between Minority and White force rates has reduced almost entirely in recent years, although the force rate is still around 20% for both groups. [12]

2.2. Dun & Bradstreet: Establishments Data

Dun & Bradstreet produces a directory of commercial establishments that includes business attributes, such as Minority ownership, employment, sales, location, and economic activity. I used two search engines to access different data structures of the D&B dataset. One is Mergent Intellect, which provides the list of all active establishments at a specific time (cross-section version). The other is Mergent Data Explr, which provides annual versions of the D&B dataset that allow following firms over time (panel D&B). The cross-section data was downloaded in May 2019 and is current as of that date. The panel data covers the 2010-2020 period.[13]

D&B identifies new establishments and updates old businesses' information using publicly available data and self-reported changes. The cross-sectional data provides the most up-to-date information, a snapshot of the commercial activity at a given time. D&B also keeps records of all changes for each and every establishment, which allows to reconstruct a firm's unique history and to build the panel data version.[14]

[12] 88% of physical force events in 2012 were related to handcuffing and use of hands for restraining, while 2% involved the withdraw of a weapon. However, weapon withdraw accounted for 22% of police force events in 2019.
[13] Data access was provided through a Syracuse University site license.
[14] The D&B panel is also the core dataset for the National Establishment Time-Series (NETS). See Kolko and Neumark (2007), Barnatchez et al. (2017), Crane and Decker (2019), and Walls & Associates (2008) for a detailed discussion about the D&B panel.

2.3. Representativeness of the D&B Data

Information on minority-owned establishments is scarce. Previous research has been limited to small samples and surveys before 2000 (Christopher, 1998; Rogers et al., 2001; Fairlie and Robb, 2007; Farrell et al., 2020). The D&B dataset provides an opportunity to study the presence and performance of minority-owned establishments and how that is related to different neighborhood attributes.

NYC employment in the D&B data is similar to that reported by Census. Census estimates that the number of workers in the 5 NYC counties in 2019 was about 4 million, while the D&B estimate is 4.1 million. The 2012 Survey of Business Owners (SBO) found that 33% of NYC firms were minority-owned and represented 21% of employment. In contrast, the 2019 D&B data shows that only 2% of establishments are minority-owned, contributing to 3% of NYC employment. There are two factors that explain these results. First, D&B only considers as minority-owned those firms that are at least 51% *owned and managed* by members of Minority populations. Second, small establishments are less likely to report their executives' race and ethnicity to D&B. However, the difference in minority-owned establishments between D&B and SBO does not imply that D&B is missing 90% of minority-owned firms. If that were the case, total employment would not be as similar as that reported by Census. This suggests that some minority-owned businesses are mistakenly labeled as nonminority.

To reduce the magnitude of the D&B minority-owned misclassification, I use executives' last names to predict their most likely race and determine Minority status. This approach uses data from Census and Tzioumis (2018) to calculate the probability that a given last name is from a White non-Hispanic, Black non-Hispanic, Hispanic, Asian, or Native American individual. Using the D&B Minority indicator as a baseline, I reclassify some nonminority businesses as

minority-owned if the race with the highest probability is other than White non-Hispanic (I refer to this sample as "predicted minority-owned"). The predicted minority-owned businesses account for 16.4% of NYC establishments and 15% of the city's employment.[15]

This paper focuses on single-site small establishments, those with 10 or fewer workers. Figure 1B shows the survival rate of three groups, nonminority-, minority-, and predicted minority-owned small businesses. In order to reduce selection bias, I restrict the analysis to companies founded between 2011 and 2018 that appeared in the D&B dataset the same year they were founded. Businesses registering years after their founding date will have a lower failure probability since they already survived the first year.

Survival rates of nonminority-owned establishments follow trends documented in the US. The Bureau of Labor Statistics (BLS) and the Small Business Administration (SBA) estimate that 20% of small establishments failed in their first year and 45% by their fifth year.[16] Although the failure rates in the first year for nonminority- and minority-owned establishments are lower than 20%, the percentage of nonminority-owned businesses that survived their fifth year is 55%. That suggests a lag between when a company closes and when the information is updated in the D&B dataset. D&B determines inactivity by directly contacting the business, and since D&B covers all of the US, this will account for the time lag.

Estimates of survival rates by Minority status are limited in the literature. Fairlie et al. (2020) use data for 4,000 firms from the Kauffman Firm Survey between 2004-2011 and find that after 5 years, 45% of Black-owned establishments have survived compared to 55% of

[15] Firms with more than one executive require that at least 50% of the listed names are from minorities. I only observed executives names and not owners', then, the predicted race strictly indicates minority-managed firms. However, the share of establishments managed by a person different to the owner is expected to be small due to the characteristics of the sample (small single-site establishments).
[16] See https://www.bls.gov/bdm/us_age_naics_00_table7.txt

White-owned.[17] Between 1992-1996, Robb (2002) finds that Black-owned and Hispanic-owned businesses have lower survival rates than Whites, while the opposite is true for Asian-owned establishments. Similar results are documented by Boden and Headd (2002), Christopher (1998), and Fairlie and Robb (2007). However, Figure 1B shows that the minority-owned businesses sample has a much higher survival rate. Two factors help explain this result. First, some minority-owned establishments are incorrectly labeled as nonminority. Second, D&B's ability to identify closures during the first business year disproportionately affects minority-owned firms. D&B has limited capacity to spot businesses that open and close within the same year, suggesting that minority-owned firms have a lower probability of getting into the D&B registry due to their higher first-year exit rate.[18] Since this sample contains high-performing firms, the estimated effects of perceptions of police bias will be underestimated.

Figure 1B confirms that the predicted minority-owned sample includes businesses with much lower survival probabilities than the Minority sample from the D&B classification. Note that the misclassification issue of minority-owned is reduced for the predicted sample, but the limitations to accurately identify the survival rate in the first year remain. Approximately 63% of predicted minority-owned establishments survived the fifth year. If one were to apply the 20% first-year failure rate estimate from BLS, the percentage of minority-owned businesses that survive their fifth year would have been 47% (similar to previous literature).

[17] The Kauffman Firm Survey sample was selected from the D&B directory at that time.
[18] The inability to separate minority-owned into Black-, Hispanic-, and Asian-owned establishments also contributes to the difference in survival rates. One concern is that D&B systematically favored minority-owned firms when determining inactivity. The propensity for this to happen is low. D&B estimates a failure index, and those with high probability of failure are closely monitored. D&B tries to contact these establishment to confirm if they went out of business (based on telephone conversations with D&B analysts).

2.4. Empirical Strategy

To estimate the effects that perceptions of police bias have on the Minority share of small establishments, I use the following model,

$$\%Minority\ Estab_{i,2019} = \alpha + \beta Police_{i,\rho} + AX_i + u_i \quad (2.1)$$

The dependent variable is the 2019 Minority share of small establishments in tract i. X_i is a vector of tract-level characteristics from the ACS 2014-2018. $Police_{i,\rho}$ is a vector that includes arrest rate and force rate by Minority status. ρ determines the reference year for the police variables, which can be 2012 or 2016. $\beta > 0$ for arrest rates and $\beta < 0$ for force rates imply that perceptions of police bias deter Minority entrepreneurs from those locations. Higher and significant effects of 2012 police variables relative to 2016 strongly suggest that perceptions of police bias are persistent over time. Focusing on the percentage of Minority establishments instead of the number allows focusing on the intensity of Minority entrepreneurship across neighborhoods that does not depend on the level of economic activity.

Fewer Minority establishments in a given location are due to lower entry or higher exit rates of Minority-owned firms. Although I cannot provide a detailed analysis of firm entry due to the lack of entrepreneurship data, I can study the survival rates of businesses in areas where Police can be perceived as biased. If perceptions of police bias discourage Minority customers and workers from these locations, one would expect that the probability of exiting the market increases due to the reduction in profits. I estimate survival models that compare establishments within the same tract that face different block levels of police activity,

$$\lambda(t|Police, M, X) = \lambda_0(t)\exp(\alpha + \beta Police_{j,t-1} + \delta M_i + AX) \quad (2.2)$$

The exit market probability at time t, $\lambda(t)$, depends on a set of covariates X that includes firm's characteristics and block-level attributes. $Police_{j,t-1}$ is a vector that includes the year lag

of the block-level arrest and force rates. $\beta < 0$ for arrest rate and $\beta > 0$ for force rate suggest that perceptions of police bias increase the market exit probability. I estimate (2.2) with all establishments, including an indicator of whether the firm is minority-owned, M_i. All models include an interaction term between police measures and M_i. I also stratify the sample by Census Tracts. That allows for comparing establishments that face similar neighborhood conditions but experience slightly different arrest rates or police use of force based on their specific city block.

2.5. Summary Statistics

Table 1 shows summary statistics for the different empirical strategies. Panel A provides the distribution of police stops across all 2,164 NYC tracts by Minority status in 2012 and 2016. The number of stops made to Minorities decreased from 469,147 to 10,816 between 2012-2016. The distribution of stops across tracts also changed dramatically. Minorities in half of NYC tracts experienced more than 104 stops in 2012, compared to 2 stops in 2016.

Table 1 Panel B provides summary statistics of the arrest rate, force rate, and other relevant variables at the Tract level. On average, arrest rates for Whites and Minorities increased more than three times between 2012-2016. Minorities seem to face disproportionally higher force rates in non-arrest stops.[19] The average tract has a 2% share of minority-owned establishments. This figure is almost ten times larger when the predicted minority-owned indicator is used instead of the D&B classification.

Panel C of Table 1 presents summary statistics for almost 120,000 small establishments included in the survival analysis to follow. The total failure rate echoes the results in Figure 1B.

[19] Given the small number of police stops in 2016 and to avoid dropping many tracts from the estimating sample, I use stops from 2017 and 2018 to recover police measures in areas with zero stops in 2016. Similarly, 2011 data was used for tracts with no stops in 2012. This process is relevant for Whites because they represent only 10% of the stops. In all circumstances, dummies for whether police variables correspond to other years were included.

The annual failure rate indicates that, on average, 9.4% of nonminority-owned and 3% of minority-owned establishments (D&B classification) cease operations every year. The exit rate for the entire sample is 9.6%, similar to that reported in previous research.[20]

3. Results

3.1. Cross-Section Results

Table 2 provides the estimated effects of police outcomes during the SQF policy on the Minority share of small establishments at the tract level. Column 1 considers the arrest rate for Minorities and Whites in 2012, while column 2 uses police variables in 2016. Columns 3 and 4 control for the arrest rates in both years, but column 4 includes the force rates in non-arrest stops for Minorities and Whites. All specifications include extensive controls at the census tract. One of these controls is the Minority share of population, which captures the propensity of Minority entrepreneurs to locate close to their potential customers and to minimize commuting time. As expected, there are more minority-owned businesses in predominantly Minority neighborhoods, indicating that Minority establishments serve largely Minority communities.

Other tract-level measures have the expected sign. Minority-owned establishments are more prevalent in tracts with a more educated population, higher homeownership rate, and higher income per capita. These are indicators of entrepreneurship activity and wealth.[21]

Tracts that experienced higher Minority arrest rates in 2012 have a higher share of minority-owned establishments seven years later. Estimated coefficients for the Minority arrest

[20] Tian (2018) shows that the annual firm death rate between 1981 and 2013 has been below 10%. Toussaint-Comeau and Williams (2020) find exit rates around 9% for firms after 2010.
[21] The complete list of controls include Minority share of population, female population share, population with high school or some college, college population share, homeownership rate, poverty rate, ln(income per capita), ln(population), share of population age 18-24, share of population age 25-44, share of population age 45-64, and ln(median monthly rent).

rate in 2016 are ten times smaller and insignificant. A 10% increase in the 2012 Minority arrest rate is associated with a 0.17 percentage points (pp) increase in the Minority share of establishments (8% increase). That is consistent with long-lasting perceptions of police bias formed during the earlier years of the SQF policy, even when concerns about disparate treatment have diminished. However, lock-in effects cannot be discarded. Perceptions of police bias in 2012 deterred Minority entrepreneurs from certain locations, and as years passed, the lack of Minority business owners further discouraged potential entrepreneurs. This effect is also an outcome of perceptions of police bias, which implies that results in Table 2 still capture the impacts of bias perceptions on the location of minority-owned businesses.

Results for the force rate in non-arrest stops in column 4 suggest that higher force rates in 2012 are associated with a lower Minority share of establishments. Although coefficients are not statistically significant, point estimates of 2012 force rates are about ten times larger than those in 2016. High standard errors might result from the low frequency of use-of-force events.

One concern is that some of the estimated effects of police outcomes are due to local crime rates. I re-estimate the models in Table 2, controlling for crimes on the street and crimes inside commercial establishments. This yields two results, (i) core findings are unaffected, and (ii) more crimes in commercial establishments reduce the share of minority-owned businesses.[22]

Perceptions of police bias affect minority-owned businesses through the change in customers' behavior. If this is the driving mechanism, estimated coefficients of police outcomes should be larger for establishments that depend heavily on nearby demand, as is the case for the retail and personal services industries (e.g., laundromats and beauty shops). Table 3 columns 4, 5, and 6 provide estimates of the effect of arrest rates on the share of minority-owned

[22] Appendix B shows the estimated models when crime variables are added to specifications in Table 2.

establishments in three group industries, retail plus personal services, nonpersonal services, and manufacturing plus construction. This last group is unlikely to respond to local perceptions of police bias since its customer base and workers are scattered across broader areas. Additionally, firms operating in predominantly Minority neighborhoods should be the most impacted by police outcomes. In columns 2 and 3, I restrict the sample to predominantly White (<30% Minority population) and predominantly Minority tracts (>70% Minority population), respectively.

Results in Table 3 confirms that the effect of arrest rate on the share of minority-owned establishments is larger in predominantly Minority neighborhoods and for industries that rely on nearby demand. Panel A uses the D&B minority-owned indicator to calculate the dependent variables. Column 3 (Minority tracts) shows that a 10% increase in the 2012 Minority arrest rate results in a 0.3 pp increase in the share of minority-owned of establishments, which is higher than those estimated for the total sample (column 1). Column 4 shows that a 10% increase in the 2012 Minority arrest rate increases the Minority share of retail establishments by 0.24 pp. This effect is bigger than those estimated for the other industries in columns 5 and 6.[23]

Table 3 Panel B replicates the models in Panel A using the predicted minority-owned establishments to calculate the dependent variables. Estimated coefficients are expected to be larger than those in Panel A since the initial sample of minority-owned businesses contains high-performing firms (Figure 1B). Column 1 corroborates this argument; estimated coefficients are at least twice those presented in Panel A. One more time, perceptions of police bias are more relevant in predominantly Minority neighborhoods and industries that depend on local demand.

[23] There is evidence that the 2016 White arrest rate has an effect on the share of minority-owned establishments in the retail and services industries. However, those coefficients are noisy and not economically significant (< 0.03 pp). Adding the force rate in non-arrest stops to the specifications in Table 3 Panel A do not change the main results. Although the estimated coefficient for 2012 force rate in predominantly Minority tracts is the only significant, the point estimates suggest that higher force rates discourage minority-owned firms with 2012 coefficients much larger than those from 2016. See Appendix A for more details.

Together, these results suggest that perceptions of police bias, as measured by arrest rates and force used in non-arrest stops, have enduring effects on Minority entrepreneurs and the location of minority-owned establishments. Customers and workers are discouraged from areas where Police might be perceived as biased, which causes small establishments to underperform. Companies will need to make up for foregone sales. If output prices are fixed across locations, this will cause some establishments to exit the market.

3.2. Failure Rate of Small Establishments

The effects of perceptions of police bias documented above can be explained by a lower entry rate or a higher failure rate of minority-owned establishments. I provide evidence that small establishments are less likely to survive in locations with lower arrest rates and higher force rates. The reason for using Minority and nonminority establishments comes from the results in Tables 2 and 3. Perceptions of police bias discourage nearby demand, primarily affecting all businesses in Minority neighborhoods. Also, the larger sample size will allow to include interactions between Minority status and police outcomes.

Table 4 shows estimated coefficients from Cox Proportional Hazard models. Only single-site establishments with 10 or fewer employees founded between 2011 and 2018 are considered. Firms located in Census Blocks with no police stops are dropped. I stratify the models by Census Tract and whether firms started before or after 2015. The first strata level allows comparisons of firms within the same tract that face different block arrest and force rates. The second strata controls for the probability that firms founded before 2015 can be more resilient to potential

disparate police treatment.[24] All models include controls for block-level and establishment-specific attributes. Variables such as the Minority share of population and the firm's industry help to characterize the challenges and environment in which a business operates.[25] Columns 1 to 3 use the D&B minority-owned indicator to explore heterogeneous effects by Minority status, while columns 4 to 6 use the predicted minority-owned classification from the firms' executives' names. Columns 1 and 4 consider all available Census Blocks. Columns 2 and 5 restrict the sample to predominantly White blocks (Minority population < 30%), and columns 3 and 6 show the results for Minority neighborhoods (>70% Minority population).

Small establishments are more likely to survive in blocks with higher arrest rates and lower force rates. Estimated coefficients for Minority arrest and force rates are almost twice as large as those for their White counterparts. Column 1 shows that if the Minority arrest rate decreases by 1%, the probability that a small business exits the market increases by 0.2%. Similarly, if the force rate in non-arrest stops increases by 1%, the failure probability increases by 0.12%.[26] Results in columns 2 and 5 strongly support the idea that perceptions of police bias influence the location of minority-owned establishments. Firms in predominantly White neighborhoods have lower failure rates if the arrest rate for Whites is high. Similar results are found in Minority neighborhoods (column 3). In blocks where Minorities represent more than 70% of the population, increments in the Minority force rate reduce the survival odds of small businesses.

[24] The higher business failure rate in areas with lower arrest and higher force rates implies differences between observed firms opening before and after 2015. The empirical sample from the former group might be more resilient, and the underlying distributions could limit reliable group comparisons.
[25] Other controls are ln(population), female share of population, share of population age 18-24, share of population age 25-44, share of population age 45-64, income per capita, homeownership rate, ln(median monthly rent), crime in commercial establishments (year lag), and employment.
[26] For $\beta_X < 0$ the effect of a change in variable X equals dx is $1 - \exp(\beta_X dx)$. For $\beta_X > 0$ the effect is $\exp(\beta_X dx) - 1$.

Estimated effects using the predicted minority-owned indicator follow the same patterns described above. There are two additional results worth highlighting. First, the significant coefficients of the interaction between Minority status and White arrest and force rates in column 4 suggest that only Minority arrest and force rates matter for the survival probability of an average minority-owned firm.[27] The second result is that the coefficient for the Minority indicator is a third of the estimated coefficients in columns 1 to 3, which echoes survival estimates in Figure 1B.

The results derived from the survival models help explain why perceptions of police bias can affect the location of minority-owned establishments. On the one hand, the decrease in profits drives small establishments out of business. On the other, the higher failure rate discourages Minority entrepreneurs from operating in those neighborhoods.

4. Conclusions

Perceptions of police bias are persistent over time and can influence the spatial distribution of minority-owned establishments. This paper uses the Stop-Question-Frisk policy in NYC to show that minority-owned firms are less likely to locate in areas that suffered from excessive policing when the program was widely perceived as biased. Two empirical strategies are carried out using the arrest rate and the share of non-arrest stops that involve police use of force as proxies for perceptions of police bias. The first strategy shows that tracts with higher arrest rates and lower force rates in 2012 have higher shares of minority-owned establishments nowadays. The second strategy finds that small firms operating in locations where Police can be perceived as biased are more likely to exit the market.

[27] This is because the magnitude of the interaction coefficients is similar to those without the interaction, but opposite signs.

I argue that these effects result from lower profit margins due to customers avoiding those locations and workers requiring higher compensation rates. To support this argument, I show that the effect of perceptions of police bias is higher in predominately Minority neighborhoods and for industries that rely heavily on nearby foot traffic, such as retail. It is also worth mentioning that police outcomes in 2016 are insignificant across the different samples, which suggests long-lasting effects of perceptions. Note that most of the firms in 2019 did not directly experience the full extent of the SQF policy, considering that more than 50% of businesses do not survive their fifth year.

Implementing new policing strategies is challenging when perceptions are hard to change. Policymakers might need to develop more active approaches to improve people's perceptions, especially when previous policies have been widely criticized. Improving the relationship between Police and the community will probably require deep structural changes (Blair et al., 2021). Finally, local governments must coordinate strategies with neighborhood leaders to improve police perceptions while incentivizing entrepreneurship activity in disadvantaged groups. These results shed light on future policing reforms, in which it is important to consider current practices and the legacy left in some communities from previous policies.

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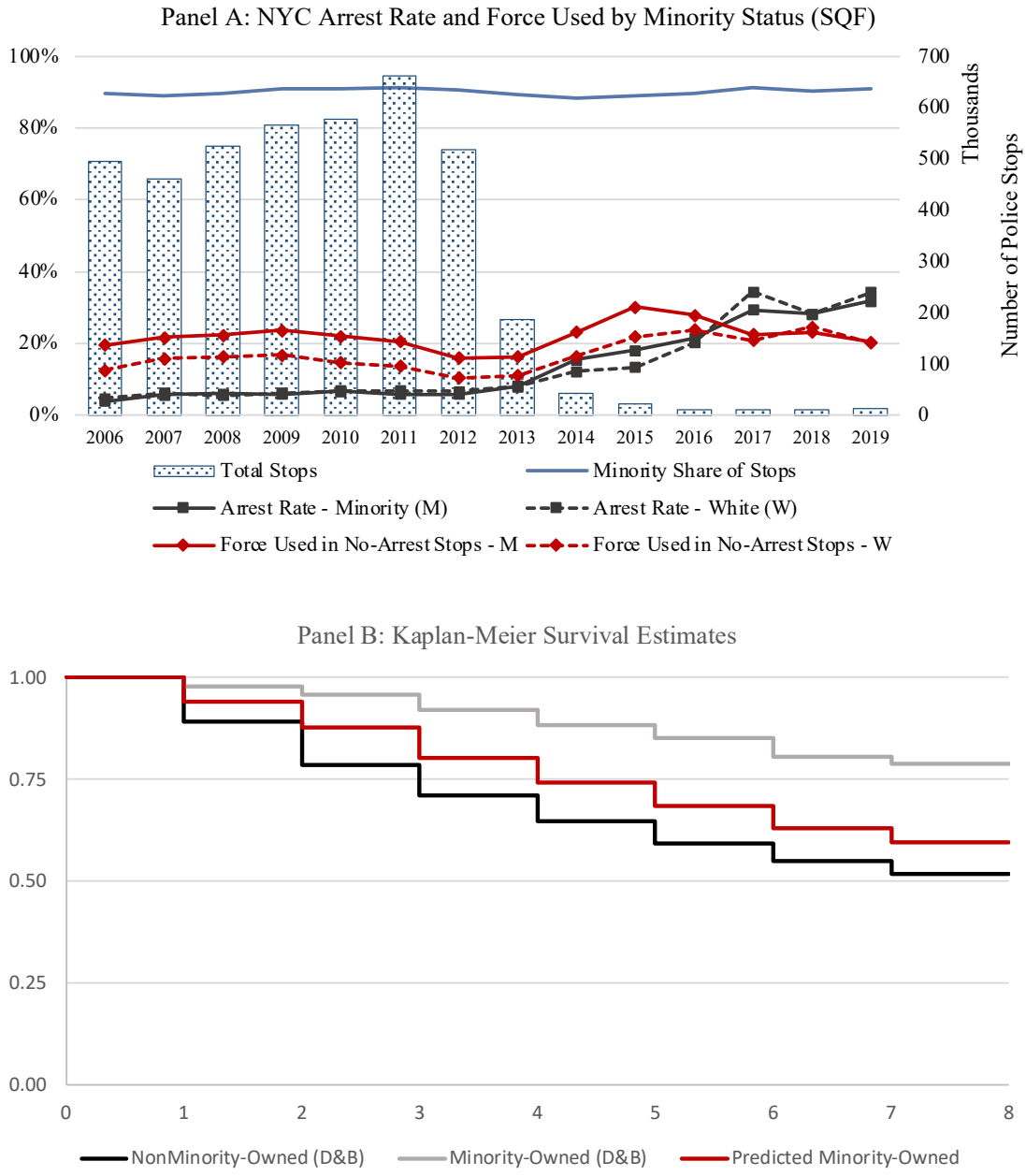
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Figure 1: Stop-Question-Frisk Policy and Survival Rate Small Minority-Owned Businesses[a]



[a] Panel A plots the citywide arrest rate and police use of force in a non-arresting stop by Minority status (based on race/ethnicity of the individual stopped). Data come from the New York Police Department.
[b] Panel B plots the Kaplan-Meier estimates for a sample of single-site establishments with 10 or less workers. Black and grey lines data are based on the Dun & Bradstreet indicator of minority-owned. The red line refers to Predicted minority-owned businesses based on executives' last names. Sample restricted to establishments founded between 2011-2018. Only companies that appeared on the D&B dataset the same year they were founded are included. Establishments on census blocks with no police stops are dropped.

Table 1: Summary Statistics NYC Census Tracts and Small Establishments Failure Rate

Panel A: Total number of Police stops in NYC and distribution over 2,164 Census Tracts

	NYC	Mean	SD	p10	p25	p50	p75	p90
Number of Police Stops								
Minority (2012)	469,147	216.80	312.18	15	39	104	265	555
Minority (2016)	10,819	5.00	7.69	0	0	2	6	12
White (2012)	48,035	22.20	30.90	2	5	12	28	52
White (2016)	1,232	0.57	1.63	0	0	0	1	2

Panel B: Summary statistics, Census Tracts Sample[a]

	Obs.	Mean	SD	p10	p25	p50	p75	p90
Arrest Rate[b]								
Minority (2012)	1,720	7.28	6.29	1.29	3.33	5.81	9.77	14.63
Minority (2016)	1,720	22.28	28.48	0.00	0.00	11.11	35.00	60.00
White (2012)	1,720	7.68	12.23	0.00	0.00	3.45	10.60	20.00
White (2016)	1,720	24.86	33.34	0.00	0.00	0.00	35.00	100.00
Force Used in Non-Arrest Stops[b]								
Minority (2012)	1,720	15.40	10.94	3.60	7.41	13.33	20.99	30.96
Minority (2016)	1,720	26.47	33.46	0.00	0.00	11.76	50.00	100.00
White (2012)	1,720	11.88	16.12	0.00	0.00	7.14	16.67	32.00
White (2016)	1,720	15.81	34.44	0.00	0.00	0.00	0.00	100.00
Minority share of estab. (D&B class.)[c]	1,720	2.07	1.27	0.80	1.15	1.79	2.62	3.74
Minority share of estab. (predicted race)[c]	2,085	19.49	9.55	7.69	12.11	18.39	26.27	33.03
Residential population	1,720	4,231	2,253	1,911	2,664	3,804	5,301	7,126
Minority share of population	1,720	59.44	28.51	17.85	32.83	63.55	86.29	93.93
Female share of population	1,720	52.11	4.33	47.18	49.53	52.01	54.80	57.28
Less HS share of population	1,720	0.15	0.11	0.03	0.07	0.13	0.22	0.31
HS + Some College share of population	1,720	45.85	16.61	17.90	36.69	49.69	57.96	63.80
College share of population	1,720	38.93	22.64	14.58	21.73	33.28	50.61	78.48
Homeownership rate	1,720	35.87	24.53	5.46	15.66	31.92	53.79	73.40
Poverty Rate	1,720	16.53	10.51	5.34	8.44	13.70	22.63	31.63
Income per capita	1,720	38,050	29,674	16,624	21,846	28,791	39,676	74,999

Panel C: Summary statistics, Establishments included in survival analysis[cd]

		Total Failure	Annual Failure	Age Distribution at Exit				
	Obs.	Rate	Rate	Mean	P25	P50	P75	Max
Nonminority-Owned estab. (D&B)	118,350	48.20%	9.42%	4.26	2	4	6	8
Minority-Owned estab. (D&B)	1,287	21.28%	3.16%	5.25	4	5	7	8
Predicted Nonminority-Owned estab.	101,450	49.09%	9.80%	4.16	2	4	6	8
Predicted Minority-Owned estab.	18,187	41.41%	7.13%	4.83	3	5	7	8

[a] Only tracts with more than 1 minority-owned small establishment are included in the sample. Small establishments are single-site companies with 10 or fewer workers. Establishment data is from Dun & Bradstreet, and controls at the Tract level are from the ACS 2018.

[b] Arrest rate and force used in non-arrest stops are calculated using Stop-Question-Frisk (SQF) data from the New York Police Department. For few Census Tracts with no stops in 2012, data for 2011 is used instead. Similarly, 2016 data is complemented with data from 2017 and 2018.

[c] D&B classification refers to the Dun & Bradstreet indicator of minority-owned. Another approach uses executives' last names to predict race and create another indicator of minority-owned to recover possible misclassifications of D&B.

[d] Sample is restricted to those establishments founded between 2011-2018. Only companies that appeared on the D&B dataset the same year they were founded are included. Establishments on census blocks with no police stops are dropped.

Table 2: 2019 Share of Minority-Owned Establishments (0 to 100)[a]

	(1)	(2)	(3)	(4)
SQF Arrest Rate (AR), scale 0 to 100[b]				
2012 AR - Whites	-0.0008		-0.001	-0.002
	(0.0023)		(0.0023)	(0.0026)
2012 AR - Minority	0.0167***		0.0164***	0.0167***
	(0.0055)		(0.0055)	(0.0054)
2016 AR - Whites		0.0008	0.0007	0.0003
		(0.0007)	(0.0007)	(0.0008)
2016 AR - Minority		0.0012	0.0011	0.0016
		(0.0009)	(0.0008)	(0.0011)
SQF Force Rate Non-Arrest Stops (FR), 0 to 100[b]				
2012 FR - Whites				-0.0031
				(0.0020)
2012 FR - Minority				-0.0009
				(0.0030)
2016 FR - Whites				0.000
				(0.0007)
2016 FR - Minority				0.0003
				(0.0008)
2014-2018 Avg ACS Tract Measures				
Minority share of population	0.0243***	0.0240***	0.0237***	0.0237***
	(0.0013)	(0.0013)	(0.0013)	(0.0013)
Female share of population	0.0119*	0.0109	0.0106	0.0099
	(0.0069)	(0.0068)	(0.0068)	(0.0067)
HS + Some College share of population	0.0172***	0.0173***	0.0178***	0.0174***
	(0.0040)	(0.0040)	(0.0040)	(0.0041)
College share of population	0.0132***	0.0129***	0.0140***	0.0140***
	(0.0042)	(0.0043)	(0.0042)	(0.0043)
Homeownership rate	0.0066***	0.0070***	0.0069***	0.0066***
	(0.0017)	(0.0017)	(0.0017)	(0.0017)
Poverty rate	0.0021	0.0036	0.0029	0.0028
	(0.0046)	(0.0048)	(0.0046)	(0.0046)
Log Income per capita	0.2738**	0.3449***	0.2628**	0.2555*
	(0.1310)	(0.1293)	(0.1321)	(0.1332)
Observations	1,720	1,720	1,720	1,720
R2	0.35	0.34	0.35	0.35
Additional Neighborhood Attributes[c]	Yes	Yes	Yes	Yes

[a] Significance is denoted as: p<0.1, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis. Estimations are at the Census Tract level, and only tracts with more than 1 minority-Owned establishment are included in the sample. Small establishment refers to single-site firms with 10 or fewer workers. Data come from Dun & Bradstreet.

[b] Arrest rate and force used in non-arrest stops are calculated using Stop-Question-Frisk (SQF) data from the New York Police Department. For a few Tracts with no stops in 2012, data for 2011 is used instead. Similarly, 2016 data is complemented with data from 2017 and 2018.

[c] Additional Neighborhood attributes include residential population, share of population age 18-24, share of population age 25-44, share of population age 45-64, and log of median monthly rent.

Table 3: 2019 Share of Minority-Owned Establishments -Selected Samples- and by Industry[a]

	(1)	(2)	(3)	(4)	(5)	(6)
	Share Minority-Owned Establishments			Share Minority-Owned Establishments in Selected Industries[e]		
	All Sample	Tracts <30% Minority Pop.	Tracts >70% Minority Pop.	Retail + SIC 72	Services - SIC 72	Manuf. & Construction
Panel A: Using Dun & Bradstreet Minority-Owned Classification[b]						
SQF Arrest Rate (AR), scale 0-100[d]						
2012 AR - Whites	-0.001	0.0001	0.0002	-0.0029	-0.0009	0.0064
	(0.0023)	(0.0036)	(0.0031)	(0.0047)	(0.0035)	(0.0093)
2012 AR - Minority	0.0164***	0.0059	0.0334***	0.0239**	0.0149*	0.0122
	(0.0055)	(0.0042)	(0.0115)	(0.0105)	(0.0089)	(0.0156)
2016 AR - Whites	0.0007	0.0012	0.0016	-0.0025*	0.0024**	0.0032
	(0.0007)	(0.0008)	(0.0015)	(0.0014)	(0.0011)	(0.0024)
2016 AR - Minority	0.0011	-0.0003	0.0028*	0.0044**	0.0003	0.0007
	(0.0008)	(0.0009)	(0.0016)	(0.0022)	(0.0014)	(0.0029)
Observations	1,720	376	756	1,720	1,720	1,719
R2	0.35	0.16	0.21	0.04	0.22	0.14
Panel B: Using the Predicted Minority-Owned Sample[c]						
SQF Arrest Rate (AR), scale 0-100[d]						
2012 AR - Whites	0.0318**	0.0185	0.0173	0.015	0.0451***	0.0272
	(0.0130)	(0.0191)	(0.0146)	(0.0199)	(0.0158)	(0.0208)
2012 AR - Minority	0.0387*	-0.0137	0.1607***	0.0632**	0.0432*	0.0321
	(0.0227)	(0.0196)	(0.0555)	(0.0318)	(0.0260)	(0.0312)
2016 AR - Whites	0.0056	0.0059	-0.0032	0.0013	0.0045	0.0058
	(0.0042)	(0.0042)	(0.0071)	(0.0057)	(0.0047)	(0.0057)
2016 AR - Minority	0.0049	-0.0051	0.0087	0.0066	0.002	0.0113*
	(0.0050)	(0.0053)	(0.0079)	(0.0074)	(0.0057)	(0.0069)
Observations	2,085	496	875	2,085	2,085	2,084
R2	0.56	0.46	0.41	0.36	0.48	0.38

[a] Significance is denoted as: p<0.1, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis. Estimations are at the Census Tract level, and only tracts with more than 1 minority-Owned establishment are included in the sample. Small establishment refers to single-site firms with 10 or fewer workers. Data come from Dun & Bradstreet. All specifications control for neighborhood attributes presented in Table 2, plus residential population, share of population age 18-24, share of population age 25-44, share of population age 45-64, and log of median monthly rent.

[b] Share of Minority establishments based on the D&B indicator of minority-owned businesses.

[c] Minority establishments are identified using the predicted race of their executives' last name.

[d] Arrest rate and force used in non-arrest stops are calculated using Stop-Question-Frisk (SQF) data from NYPD. For a few Tracts with no stops in 2012, data for 2011 is used instead. Similarly, 2016 data is complemented with data from 2017 and 2018.

[e] Retail refers to SIC 52-59 and 72. Services refer to SIC 70, 71, 73-89. Construction is SIC 15-17 and Manufacturing is SIC 20-39.

Table 4: Nonminority- and Minority-Owned Small Establishments Failure Rates
(Cox Proportional Model Coefficients)[a]

	(1)	(2)	(3)	(4)	(5)	(6)
	Minority-Owned D&B Indicator[b]			**Predicted Minority-Owned Indicator[c]**		
	All	Blocks <30% Minority Pop.	Blocks >70% Minority Pop.	All	Blocks <30% Minority Pop.	Blocks >70% Minority Pop.
Minority-Owned (M)	-1.1584***	-1.0437***	-1.0972***	-0.3722***	-0.3227***	-0.4135***
	(0.1149)	(0.1965)	(0.2053)	(0.0283)	(0.0497)	(0.0570)
Arrest Rate - Whites	-0.0014***	-0.0017***	-0.0021***	-0.0017***	-0.0019***	-0.0025***
	(0.0004)	(0.0006)	(0.0008)	(0.0004)	(0.0006)	(0.0008)
Arrest Rate - Minority	-0.0022***	-0.0013*	-0.0038**	-0.0022***	-0.0012	-0.0044**
	(0.0005)	(0.0007)	(0.0019)	(0.0006)	(0.0007)	(0.0021)
(Arrest Rate - Whites) * M	0.0010	-0.0091	0.0015	0.0018**	0.0021	0.0012
	(0.0034)	(0.0082)	(0.0046)	(0.0009)	(0.0018)	(0.0015)
(Arrest Rate - Minority) * M	0.0021	0.0097	0.0086	0.0014	-0.0003	0.0022
	(0.0066)	(0.0087)	(0.0135)	(0.0014)	(0.0021)	(0.0033)
SQF Force Used Non-Arrest Stops (FR)						
FR - White	0.0007**	-0.0001	0.0001	0.0009***	-0.0001	0.0003
	(0.0003)	(0.0005)	(0.0005)	(0.0003)	(0.0005)	(0.0006)
FR - Minority	0.0012***	0.0007	0.0076***	0.0014***	0.0006	0.0082***
	(0.0004)	(0.0006)	(0.0012)	(0.0004)	(0.0006)	(0.0013)
(FR - White) * M	-0.0028	-0.0095	0.0012	-0.0015**	-0.0013	-0.0008
	(0.0030)	(0.0067)	(0.0042)	(0.0007)	(0.0015)	(0.0011)
(FR - Minority) * M	0.0042	0.0142**	-0.0055	-0.0010	0.0022	-0.0028
	(0.0038)	(0.0059)	(0.0075)	(0.0010)	(0.0017)	(0.0020)
Log Likelihood	-118,239	-54,879	-17,996	-118,126	-54,868	-17,936
Failures	31,734	13,872	6,893	31,734	13,872	6,893
Total Establishments	81,847	35,318	16,382	81,847	35,318	16,382
Census Blocks	5,358	1,971	2,264	5,358	1,971	2,264
Stratified by Census Tract	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls[d]	Yes	Yes	Yes	Yes	Yes	Yes

[a] Table reports estimated coefficients. Significance is denoted as: p<0.1, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis. The sample considers both minority- and nonminority-owned small firms. Small establishment refers to single-site firms with 10 or fewer workers. Sample is restricted to those establishments founded between 2011-2018. Only companies that appeared on the D&B dataset the same year they were founded are included. Establishments on census blocks with no police stops are dropped.
[b] Minority establishments are identified using the D&B indicator of minority-owned businesses.
[c] Minority establishments are identified using the predicted race of their executives' last name.
[d] Other controls include block-level and establishment-level variables. Block-level controls are residential population, Minority share of population, female share of population, share of population age 18-24, share of population age 25-44, share of population age 45-64, homeownership rate, income per capita, median monthly rent, and crime in commercial buildings (year lag). Establishment controls include industry fixed effect and employment. Also, results are stratified by firms starting before and after 2015.

Appendix A: Force Rate and Share of Minority-Owned Establishments -Selected Samples

I extend the models in Table 3, in which the 2019 share of minority-owned establishments depends on the 2012 arrest rate by controlling for the police use of force in non-arrest stops. Table A1 replicates the structure of Table 3 and shows that adding the force rate measures does not affect the results discussed in the paper. Regarding the force rate variables, their estimated coefficients have the expected sign across specifications. High force rates in non-arrest stops are associated with a lower Minority share of establishments. However, the comparison between predominantly White and Minority tracts is revealing. In tracts with more than 70% Minority population, a 10% increase in the 2012 White force rate reduces the Minority share of establishments by 0.05 percentage points. Force use on Whites in predominantly Minority neighborhoods will be concerning for both Whites and Minorities, especially if there are already perceptions of police bias against Minorities.

Table A1: 2019 Share of Minority-Owned Establishments -Selected Samples- and by Industry[a]

	(1)	(2)	(3)	(4)	(5)
	Share Minority-Owned Establishments		**Share Minority-Owned Establishments in Select Industries[d]**		
	Tracts < 30% Minority Pop.	Tracts > 70% Minority Pop.	Retail with Personal Serv.	Services w/out Personal. Serv.	Manuf. & Construction
SQF Arrest Rate (AR), scale 0 to 100[b]					
2012 AR - Whites	-0.0007	-0.0011	-0.0014	-0.0031	0.0036
	(0.0036)	(0.0037)	(0.0052)	(0.0040)	(0.0096)
2012 AR - Minority	0.0054	0.0328***	0.0230**	0.0154*	0.0133
	(0.0041)	(0.0114)	(0.0105)	(0.0088)	(0.0157)
2016 AR - Whites	0.0000	0.0012	-0.0034**	0.0018	0.0025
	(0.0010)	(0.0017)	(0.0016)	(0.0013)	(0.0028)
2016 AR - Minority	0.0012	0.0024	0.0062**	0.0012	0.0012
	(0.0012)	(0.0021)	(0.0030)	(0.0017)	(0.0037)
SQF Force Rate in Non-Arrest Stops (FR), scale 0 to 100[b]					
2012 FR - Whites	0.0009	-0.0046**	-0.0044	-0.0008	-0.0012
	(0.0029)	(0.0023)	(0.0033)	(0.0034)	(0.0069)
2012 FR - Minority	0.0042	-0.0024	0.0029	0.0009	-0.0132
	(0.0028)	(0.0055)	(0.0057)	(0.0045)	(0.0096)
2016 FR - Whites	0.0001	0.0007	0.0006	-0.0006	0.0016
	(0.0008)	(0.0014)	(0.0015)	(0.0010)	(0.0022)
2016 FR - Minority	-0.0002	-0.0007	-0.0002	0.001	-0.0013
	(0.0009)	(0.0014)	(0.0016)	(0.0013)	(0.0027)
Observations	376	756	1,720	1,720	1,719
R2	0.19	0.22	0.04	0.22	0.15
Neighborhood Attributes[c]	Yes	Yes	Yes	Yes	Yes

[a] Significance is denoted as: p<0.1, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis. Estimations are at the Census Tract level, and only tracts with more than 1 minority-Owned establishment are included in the sample. Small establishment refers to single-site establishments with 10 or fewer workers.
[b] Arrest rate and force used in non-arrest stops are calculated using Stop-Question-Frisk (SQF) data from the New York Police Department. For few Census Tracts with no stops in 2012, data for 2011 is used instead. Due to the limited number of stops in 2016, SQF variables use data for 2017 and 2018 to recover missing values.
[c] Neighborhood attributes include the same controls as those presented in Table 2, plus residential population, share of population age 18-24, share of population age 25-44, share of population age 45-64, and log of median monthly rent.
[d] Retail refers to SIC 52-59 and 72. Services refer to SIC 70, 71, 73-89. Construction is SIC 15-17 and Manufacturing is SIC 20-39.

Appendix B: Criminal Activity, Perceptions of Police Bias, and Minority-Owned Establishments

One of the main concerns from the empirical strategy is that some of the estimated effects of police measures on minority-owned establishments might result from the link between arrest rates and criminal activity. Table B1 shows the effect of perception of police bias on the share of minority-owned establishments controlling for the number of crimes that happened in commercial establishments and the number of crimes that occurred on the streets in 2017. The main results remain unchanged, and the estimated coefficients for the crime variables suggest that only criminal activity in commercial buildings matters. Census Tracts with higher levels of criminal activity discourage Minority entrepreneurs.

It is worth mentioning that the D&B snapshot of NYC establishments was downloaded in May 2019. Then, 2017 crime data guarantees at least a year lag. However, different temporal lags were considered to account for the dynamics between crime rates and police behavior. The core results remain unaffected by those specifications.

Table B1: 2019 Share of Minority-Owned Establishments -Selected Samples and by Industry-Controlling for Criminal Activity[a]

	(1)	(2)	(3)	(4)	(5)	(6)
	Share Minority-Owned Establishments			**Share Minority-Owned Establishments in Selected Industries[c]**		
	All Sample	Tracts <30% Minority Pop.	Tracts >70% Minority Pop.	Retail + SIC 72	Services - SIC 72	Manuf. & Construction
SQF Arrest Rate (AR), scale 0-100[b]						
2012 AR - Whites	-0.0008	0.0008	0.0008	-0.0008	-0.0009	0.0025
	(0.0025)	(0.0037)	(0.0034)	(0.0046)	(0.0036)	(0.0098)
2012 AR - Minority	0.0176***	0.0068	0.0317***	0.0273**	0.0163*	0.0126
	(0.0056)	(0.0042)	(0.0117)	(0.0107)	(0.0091)	(0.0161)
2016 AR - Whites	0.0004	0.001	0.0012	-0.0028**	0.0021*	0.003
	(0.0007)	(0.0008)	(0.0015)	(0.0014)	(0.0011)	(0.0024)
2016 AR - Minority	0.001	-0.0002	0.0026	0.0034*	0.0004	0.0001
	(0.0008)	(0.0009)	(0.0016)	(0.0018)	(0.0013)	(0.0029)
ln(# Crimes - Commerce)[d]	-0.0796**	-0.0642**	-0.045	-0.0784	-0.0454	-0.2141**
	(0.0313)	(0.0325)	(0.0618)	(0.0721)	(0.0503)	(0.1068)
ln(# Crimes - Street)[d]	-0.05	0.0111	-0.1099	-0.0663	-0.0003	-0.1028
	(0.0574)	(0.0596)	(0.1197)	(0.1134)	(0.0879)	(0.2009)
Observations	1,696	367	744	1,696	1,696	1,695
R2	0.35	0.16	0.2	0.04	0.21	0.15

[a] Significance is denoted as: p<0.1, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis. Estimations are at the Census Tract level, and only tracts with more than 1 minority-Owned establishment are included in the sample. Small establishment refers to single-site firms with 10 or fewer workers. Data come from Dun & Bradstreet. All specifications control for neighborhood attributes presented in Table 2, plus residential population, share of population age 18-24, share of population age 25-44, share of population age 45-64, and log of median monthly rent. The Share of Minority establishments is based on the D&B indicator of minority-owned businesses.

[b] Arrest rate and force used in non-arrest stops are calculated using Stop-Question-Frisk (SQF) data from NYPD. For a few Tracts with no stops in 2012, data for 2011 is used instead. Similarly, missing data from 2016 is complemented with 2017 and 2018 data.

[c] Retail refers to SIC 52-59 and 72. Services refer to SIC 70, 71, 73-89. Construction is SIC 15-17 and Manufacturing is SIC 20-39.

[d] Crime data comes from the NYPD and refer to criminal activity on the streets or inside commercial buildings in 2017.