DISTRIBUTION OF PAYCHECK PROTECTION PROGRAM FUNDING DURING THE COVID-19 PANDEMIC

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SUPERVISORY COMMITTEE:

Dr. Thomas Krumel
Chair

Dr. Kerianne Lawson

Dr. Siew Lim

Dr. Ali Enami

Approved:

4/12/2024
Date

Dr. Cheryl Wachenheim
Department Chair

ABSTRACT

This thesis investigates the distribution of Paycheck Protection Program (PPP) loans, focusing on racial disparities in loan allocation and the differential effects on rural businesses. Employing a Cragg-Hurdle regression model, I extend previous methodologies to explore the influence of a community's racial composition on PPP loan distribution, particularly in the previously unexamined third tranche. I also assess the program comprehensively. My results reveal that majority-minority communities, particularly those with a higher Black population share, received drastically more funding in the third tranche compared to earlier rounds. Additionally, I analyze the impact of nontraditional lenders and policy changes introduced by the Biden-Harris Administration, uncovering nuanced variations in loan distribution concerning urban and rural demographics. Ultimately, my findings indicate substantial shifts in racial disparities in PPP loan distribution across the third tranche and the entire program, underscoring the necessity for an updated understanding of this issue in the existing literature.

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CARES	Coronavirus Aid, Relief, and Economic Stability (Act)
CBP	County Business Patterns
NAICS	North American Industry Classification System
PPP	Paycheck Protection Program
SBA	Small Business Administration
ZIP	Zone Improvement Plan

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1. INTRODUCTION

To counteract the effects of the pandemic and its ensuing lockdowns on small businesses, the United States Congress enacted and provided initial funding for the Paycheck Protection Program (PPP) as part of the Coronavirus Aid, Relief, and Economic Stability (CARES) Act. This included a non-binding Sense of the Senate resolution which stated:

> It is the sense of the Senate that the Administrator should issue guidance to lenders and agents to ensure that the processing and disbursement of covered loans prioritizes small business concerns and entities in underserved and rural markets, including[...] small business concerns owned and controlled by socially and economically disadvantaged individuals[...], women, and businesses in operation for less than 2 years. (United States Congress, 2020)

Over three funding rounds, the government allocated over $950 billion to the PPP. Rather than direct management, the Small Business Administration (SBA), which oversaw the program, depended on SBA-qualified lenders for application processing and loan distribution. The first tranche began April 3rd and having exhausted its funding, ended April 16th, 2020. After the passing of the Paycheck Protection Program and Health Care Enhancement Act, a second tranche began on April 27th, and applications were accepted through August 8, 2020. Beginning on December 27th, 2020, the third tranche, funded under the Consolidated Appropriations Act, allowed previous borrowers to apply for a second draw of funding in addition to providing loans to new applicants. On February 22nd, 2021, the Biden-Harris Administration announced five changes to the program:

- A two-week period beginning on February 24th during which only businesses with fewer than 20 employees could apply for PPP funding

- A revised formula for calculating loan amounts for sole proprietors, independent contractors, and self-employed individuals
- Business owners with non-fraud-related felonies who were not currently incarcerated were made eligible for the program
- Business owners with delinquent federal student loans were made eligible for the program
- Non-citizens lawfully residing in the U.S. were clarified as eligible for the program (The White House, 2021)

Given the program's stated goal quoted above as well as the historic scale of the program, there has been significant effort in the literature dedicated to investigating inequities in the distribution of loans under the program. It has been documented in the literature that minority-owned businesses and majority-minority communities received less funding in the first tranche of the program (Atkins et al., 2022; Fairlie and Fossen, 2022). Smaller businesses were less aware of the program and more likely to be denied loans (Humphries et al., 2020), and the majority of the program's funding did not go to employees who would have otherwise lost their jobs (Autor et al., 2022a). Because of the delayed publication of data for the third tranche of the program, investigations pertinent to this paper, particularly those examining the impact of race, have predominantly concentrated on the initial and second tranches. Consequently, the final tranche, along with the program's overall funding distribution, has remained largely unexplored in terms of racial equity.

I adopt the methodologies employed in prior literature to examine the impact of a ZIP code's racial composition on loan distribution during both the third tranche and the entire program. However, I introduce several significant modifications to enhance the suitability of

these methods for my dataset. Much of the existing literature relies on loan-level analyses. By aggregating PPP loan data at the ZIP code level, I address several inherent limitations of loan-level analyses. These include the nonrandom and insufficient reporting of business owners' races[1], the inability to consider the allocation of funds to employees as well as business owners, and the inclusion of an additional metric of loan distribution, namely the number of loans. This approach also mitigates issues like survivorship bias and over-representation of densely populated areas, making it a more suitable and conservative method for examining the program's impact on diverse communities.[2] Second, I make use of a Cragg-Hurdle regression model which accounts for the zero-inflated nature of the data and allows the coefficients of my variables to vary between estimating whether a ZIP code receives any loans and the amount of that funding conditional on receiving any. Previous studies have typically controlled for rurality but have grouped urban and rural racial categories together as a single variable. However, it's crucial to recognize that the same race in urban and rural areas could have been treated differently by those administering the PPP, a possibility that has yet to be investigated in the previous literature. Therefore, I disaggregate the influence of the proportion of a ZIP code's population classified as White or Black in urban and rural areas. Next, I exclude loans from nontraditional lenders from the sample and compare the results. The acceptance of nontraditional lenders changes between tranches, making it necessary to compare tranches with and without their loans. Finally, I model the role of racial demographics over the course of the third tranche to see how it changes during

[1] The share of loans reporting race across the three tranches are 20.8%, 16.8%, and 29.7%, chronologically. These numbers are higher than other studies have reported in their summary statistics, but a significant number of fraudulent loans were found after the conclusion of the program (my version of the data, published June 30th, 2023, contains about 400,000 fewer loans than the SBA's reported number as of 5/31/2021). It is possible that this is the reason for these differences, but I do not know this definitively.
[2] The benefits and costs of aggregation are discussed further in Section 3.

and after the changes made by the Biden-Harris Administration. I then rerun the regressions on seven two-week periods centered on the exclusive application period for the smallest businesses.

Prima facie, the third tranche looks markedly different from its predecessors. Without controlling for other factors, more loans and more funding flowed to majority-minority ZIP codes than had previously. Previewing my key findings, I observe a notable trend regarding the association between the White share of the population in urban ZIP codes and loan number. While initially positively correlated in the first tranche, this relationship progressively turns negative in the second and third tranches. In contrast, the relationship between the White share of the population in rural ZIP codes and loan number exhibits a more intricate pattern. Initially positive in the first tranche, it approaches no economically meaningful relationship in the second, and begins notably more negatively associated with loan number in the third tranche. However, this negativity quickly transforms into a positive association. Rural White Share is less positively associated with loan receipt in the first tranche and less negatively associated in later tranches than urban White Share. I find that Black share of the population is almost always positively associated with loan number in all three tranches as well as the overall program, and this relationship is much larger in the third tranche than in the first and second.[3] These patterns hold true for loan amounts as well where, at its peak, a percentage point increase in the Black share of an urban ZIP code's population is associated with more than $128 more per employee in that ZIP code during the third tranche (around 4% the mean outcome in that tranche) and more than $212 overall (over 2% the mean for the whole program). The third tranche (for the most part) heavily influences the full program, indicating that the results of the previous investigations into the

[3] My excluded category is non-Black minorities. The previous literature almost exclusively uses White as the base category. This change is likely what drives this difference in findings.

inequities of loan distribution which did not include the third tranche are no longer representative of the program as a whole. Removing loans from nontraditional lenders reduces the magnitude of the negative relationship White share in urban ZIP codes has with loan number and amount in the later tranches and decreases its significance in the overall model for loan number. Doing so also greatly reduces the positive relationship Black share of a ZIP code's population has with loan number in the third tranche and program as a whole for both loan number and size. This suggests nontraditional lenders explain a large part (but not all) of the increase in the coefficients' magnitudes in the third tranche. Comparing the coefficients before and after the changes made to the third tranche reveals large differences. White share of the population becomes much more negatively associated with loan number and size except in rural, majority-White ZIP codes. Black share of the population becomes much more positively associated with both metrics of loan receipt, again displaying the largest shift of the three. The coefficients in the first part of the third tranche (before the changes) look much more like those seen in previous tranches which would seem to suggest the changes made by the Biden-Harris Administration mark a turning point in the program. The shifts displayed in periods before these changes, however, call this into question. Over the course of the third tranche, the coefficients for my three variables of interest (urban and rural White share and Black share) largely converge until after the two-week exclusive application period when they become just as (if not more) separated as (than) before.

In the next section, I summarize the previous literature as it relates to the PPP as well as my paper. I then discuss my data and methodology in Sections 3 and 4. I further motivate my analysis by extending Fairlie and Fossen's methods (2022) to the third tranche in Section 5. Section 6 presents the results of my models, and Section 7 discusses those results. I conclude in Section 8.

2. LITERATURE REVIEW

The effectiveness of the PPP on maintaining employment has been widely investigated. Hubbard and Strain (2020) compare businesses which are likely eligible for the PPP against those which likely ineligible based on the number of employees (1-500 and 500-1000, respectively); they find a business receiving a PPP loan had a positive effect on employment and that this effect increased over time (their study ends in August of 2020, and they caution that this may be due to partial re-openings). Autor et al. (2022b) similarly compare the employment levels of businesses which are likely eligible and ineligible based on size using data from ADP on payroll numbers. They find that the PPP boosted employment 2-5% (approximately 3.6 million jobs) at eligible firms relative to ineligible ones but that this effect decreased through the end of 2020.

The program, however, was not without its flaws. The effects of the PPP on employment were quite small relative to the size of the program (Autor et al., 2022a; Granja et al., 2020), with Autor et al. (2022a) estimating the program to have cost $169,000 to $258,000 per job-year retained. Granja et al. (2020) point to many firms spending their funding on non-payroll costs and savings. Autor et al. (2022a) estimate that only 23-34% of the programs funding went to employees who otherwise would not have kept their jobs and that about 72% of the program's funding went to the top quintile of households by income. Furthermore, the smallest businesses were less likely to be aware of the program early on, less likely to apply, and more likely to be denied a loan if they applied (Humphries et al., 2020). Significant efforts have also been focused on the equity of the distribution of loans with regard to race.

2.1. Racial Equity

The racial equity of loan distribution in the first two tranches has been extensively analyzed in the literature. In the first tranche, Black-owned businesses received loans about half the size of their White-owned counterparts (Atkins et al., 2022), and minority communities received fewer loans per employer establishment and smaller total loan amounts per employee (without controlling for other factors) (Fairlie and Fossen, 2022). This cooled slightly in the second tranche. The differences in loan amounts to Black- and White-owned businesses became insignificant over the course of the second tranche (Atkins et al., 2022), and minority communities received more loans per employer establishment (again, without controlling for other factors) (Fairlie and Fossen, 2022). Across all three tranches, Black-owned businesses which reported race received loans about half the amounts their counterparts which did not report their owners' race received (in Durham, NC, specifically) (Garcia and Darity, 2022), and Black-owned businesses were more likely to be denied loans from traditional lending sources (Howell et al., 2024).

Analyzing loan distribution is made difficult by a number of factors, not least of which is the variety of ways to define the metric itself (loan amounts, loan number, forgiveness, etc. among several other factors like loan denial and loan officer's treatment of applicants for which data is not provided), and this is borne out in the literature. Various papers have employed a multitude of ways to measure loan distribution at a multitude of levels. These different ways of handling the data are often responses to the same problem: reporting of business-owner characteristics was voluntary, and the majority of business owners did not self-report. This makes analyzing racial disparities in loan receipt less than straightforward.

Methods of accounting for the lack of self-reporting business-owner race vary by the level of data employed. Papers which employ a loan-level analysis try to correct for or fill in unreported race observations (e.g., Atkins et al., 2022; Garcia and Darity, 2022; Howell et al., 2024). Another method is to aggregate loan distribution (e.g., Fairlie and Fossen, 2022). This is done at the ZIP code-level as this was the smallest standard geographical variable reported in the loan data. This allows the circumvention of non-random and lacking race reporting via racial demographics at the cost of imprecise identification of loan recipients' races.

Atkins et al. (2022) use a Heckman selection variable to account for non-random self-reporting of business-owner race. This is constructed from a regression predicting the concealing of race when applying for a loan using various racial demographic variables at the ZIP code level along with other factors like education and rurality as well as corporate form, industry, and state indicators. The resulting variable is then used in their main regression. Conversely, , Garcia and Darity (2022) fill in race data using a variety of sources including Black small business directories, company websites, and social media. The cost of this primary data collection is a (much) smaller sample size as they limit their analysis solely to Durham, NC. Rather than hand-collecting data, Howell et al. (2024) use a two-part process involving machine learning to predict borrowers' races. They first estimate the probability that an individual belongs to a certain racial group conditional on their last name and location using data from the 2000 Census on last names and census tract racial distributions from the American Community Survey. Next, they pass this probability along with racial distributions of first names and industries by employer status as inputs to a random forest model. They argue that because loan officers would observe and infer race from these characteristics (name and location) more often than actually observing race, these predicted races are more relevant because loan officers would be more likely to view (and

then react to) applicants as the race most commonly associated with their name or location. This method is less precise than hand-collecting data but allows the analysis to be run on the full sample of loans.

In contrast to these loan-level analyses, Fairlie and Fossen (2022) choose to aggregate loans to the ZIP code level and use racial demographics as the variables of interest. This allows them to construct two measures of loan receipt: loan amount per employee (the sum of all loans to a business in a ZIP code divided by the number of employees in that ZIP code) and number of loans per employer establishment (the number of loans to businesses in a ZIP code divided by the number of business establishments in that ZIP code). This also allows them to analyze a metric (loan number) which is not included in the loan-level analyses. Finally, they conduct a univariate analysis comparing their two measures of loan distribution against the minority share of ZIP codes' populations. These methods of analyzing loan distribution and accounting for the sparce reporting of race suggest a tradeoff between the granularity of the analysis and the precision of the imputed race observations with hand collected data and aggregated data on either end. A more thorough discussion of the pros and cons of aggregating data is presented in the next section.

Wide scale investigations into the program's (in)equity with regard to race seem to have stalled after the second tranche. The third tranche, however, saw changes in the program's rules including a two-week period of exclusive availability to firms with fewer than 20 employees and revising the funding formula for sole proprietorships, independent contractors, and self-employed individuals which had previously received loans as small as $1 (which is why I do not employ the winsorization technique found in Atkins et al. (2022)). These alterations to the

program's rules as well as the mere presence of an additional tranche make updating the literature's understanding of the program's inequities all the more vital.

2.1.1. Nontraditional and Fintech Lenders

Due to the program's use of banks to approve and distribute loans, lending was significantly impacted by borrowers' pre-existing relationships with banks, and these relationships are not distributed evenly amongst business owners. Gopal and Schnabl (2022) show that non-bank lenders have replaced much of the market for small-business lending since 2008, and Zeeuw and da Motta (2021) find that from 2016 through 2019 Black-owned businesses were 1.6 times more likely to apply for a loan from a CDFI than an observationally similar White-owned business. Indeed, smaller, minority-owned firms were more likely to borrow from fintech and non-bank lenders during the PPP (Chernenko and Scharfstein, 2022). Nontraditional and fintech lenders, however, were not widely approved to participate in the program until the second tranche. This change in the program's rules has thus been pointed to as a potential mechanism for the lessening of the disparities faced by Black and minority business owners as fintech lenders are disproportionately used in majority-minority ZIP codes (Erel and Liebersohn, 2020).

Atkins et al. (2022) investigate this possibility by splitting their sample into a pre-May 1st sample and six two-week segments after April 30th when non-traditional lenders were approved to participate in the program. They find that the coefficients for White and Black business owners (indicators relative to unreported race) converge after May 1st, 2020, and there is no statistically significant difference by late July.

Howell et al. (2024) utilize a dataset of PPP loan applications including those which were denied from Lendio, an online service which randomly matches applicants with lenders. They

compare the denial rates faced by different racial groups from traditional and fintech lenders. There were no differences in the odds of receiving a loan from fintech lenders for different racial groups, but traditional lenders were 3.9 percentage points more likely to deny a loan to a Black-owned business. Additionally, Black-owned businesses were 5.8 percentage points more likely to get no loan from any traditional lender. The authors point to automation as the driving force of these disparities. They use a differences-in-differences model and find that after small banks automated their loan processes, the share of their loans to Black-owned businesses nearly doubled.

It is evident that nontraditional and fintech lenders have played a crucial role in alleviating the disparities experienced by Black and minority business owners.

3. DATA

I utilize the two dependent variables, namely the number of loans per employer establishment and the mean loan amount per employee, as outlined in Fairlie and Fossen (2022). Both variables are calculated using the loan data provided by the Small Business Administration (2023). The data in its original form is at the loan level, but I aggregate to the 5-digit ZIP code level. Loans without a reported ZIP code are therefore excluded. I exclude loans to recipients outside the 50 states and District of Columbia as well as those to independent contractors and self-employed individuals. I then use County Business Patterns (CBP) data from the United States Census Bureau (2022) supplemented with data on the counts of farms from the National Agricultural Statistics Service (2017) to obtain a count of employer establishments for each ZIP code. The CBP data must be supplemented with farm counts because it lacks data for businesses in Crop and Animal Production (NAICS beginning with 111 and 112). The farm count data does not include the number of employees, so these NAICS codes are excluded from the analysis of loan amounts per employee. The CBP also lacks data for Rail Transportation; Postal Sevice; Pension, Health, Welfare, and Other Insurance Funds; Trusts, Estates, and Agency Accounts; Offices of Notaries; Private Households; and Public Administration[4], so I exclude loans to businesses reporting these NAICS codes from both measures. To calculate the number of loans per employer establishment, I divide the number of loans to a ZIP code by the total number of employer establishments from the above sources. The mean loan amount per employee is calculated by totaling the value of all loans awarded to businesses in each ZIP code (excluding

[4] NAICS codes starting with 482, 491, 525110, 525120, 525190, 525920, 541120, 814, and 92

Crop and Animal Production) and dividing by the number of employees reported in the CBP data.

Aggregating to the ZIP code level has a number of advantages compared to a loan-level analysis. The share of loans reporting business owners' races is, as pointed out by both Fairlie and Fossen (2022) and Atkins et al. (2022), exceedingly low, and the loans reporting race are not randomly distributed. As previously discussed, there are ways to account for this, but loan-level analyses do not account for an important factor: PPP loans were required as a condition of their receipt to go largely toward payroll expenses in order to be forgiven, meaning the actual funding went to employees of the company in addition to the owner. The business owner's characteristics are not a sufficient or complete picture of where PPP funding went. Secondly, aggregation also allows us to analyze loan number. This is especially relevant after second draws of funding were allowed during the third tranche. Treating these second draws like regular loans in a loan-level analysis would be problematic due to the double-counting of businesses which received a second draw, skewing the estimates. Thirdly, a loan-level analysis systematically leaves out those businesses which did not receive loans. Failing to account for these businesses (which in effect received loans of $0) introduces survivorship bias on two fronts (those which did not apply and those which were denied) leading to a misestimation of the coefficients and limited generalizability. Fourthly, the direction of the Senate for the SBA to "ensure that the processing and disbursement of covered loans prioritizes[...] entities in underserved and rural markets" (United States Congress, 2020) indicates that the SBA was likely considering applications (at least in part) based on their surrounding community. Finally, simply including demographic variables in a loan-level regression would over-emphasize the demographics of highly populated areas, and the sheer number of the observations included would inflate the statistical significance

of the predictors. An aggregated analysis, though it may introduce aggregation bias, is a more conservative estimation technique due to its inclusion of fewer observations. Collectively, these reasons suggest that a ZIP code-level analysis is more appropriate for my specific research objectives.

Aggregation in this manner does require some assumptions. The first of which is that the businesses, workers, and loans within a ZIP code are homogenous. Obviously, this is likely not always the case as businesses differ in the goods and services they provide, and these industries were affected differently by the COVID-19 pandemic and thus treated differently by the SBA. Secondly, my aggregation assumes that each loan should have an equal impact on the final variables. This seems plausible as there is no obvious reason why larger/smaller loans or loans to businesses in a certain industry should have more or less weight than others. Thirdly, aggregation assumes a linear relationship between my outcome variables and the individual loans themselves. This again appears to be a fair assumption for reasons not unlike those justifying the previous assumption. Finally, aggregation to the ZIP code level assumes that loan receipt within a ZIP code is independent of loan receipt in other ZIP codes. This assumption is likely more easily justified for geographically larger ZIP codes encompassing multiple towns or areas where a loan to a business in one ZIP code is unlikely to have an effect on loan receipt in areas further away than in areas with smaller ZIP codes.

Aggregation also introduces a few potential problems for my model in reaching the correct estimations. Simpson's paradox (when trends in the data at one level of analysis disappear or reverse at other levels) would lead to estimates that misrepresent the direction, magnitude, and significance of the relationships faced by individual businesses. This problem is similar to another issue that arises from aggregation, the ecological fallacy: assuming that characteristics

present at an aggregate level are also present at the individual level. A possible finding of my analysis could be that ZIP codes with a higher percentage of the population being White received more loans. This does not necessarily mean that White business owners received more loans than they otherwise would have. This is an important limitation on the scope of my results.

My variables of interest, *White Share* and *Black Share*, represent the share of a ZIP code's population held by individuals classified as non-Hispanic Whites and Blacks or African Americans (regardless of ethnicity), respectively. I include squared terms for both of these variables as well as interactions with *Rural Indicator* for *White Share* and its square. *Rural Indicator* is a binary version of *Rural* (which measures the percentage of a ZIP code's population living in a rural area) equal to 1 if 50% or more of a ZIP code's population is living in a rural area and 0 otherwise. Controlling for rurality is important because rural business owners would likely have to travel comparatively farther to reach a lender's physical location. This might disincentivize applying for a PPP loan. My data uses the U.S. Census Bureau's definitions of urban and rural areas: urban areas are either "Urbanized areas, which contain 50,000 or more people" or "Urban clusters, which have at least 2,500 people but fewer than 50,000 residents" (U.S. Census Bureau, 2020). Any areas not classified as urban are classified as rural. I include indicators for Census Region (with West as the omitted category) to account for any location-based differences. I also control for education (via the percent of a ZIP code's population with at least a Bachelor's degree), per capita income, inequality (via the Gini coefficient), and the unemployment rate. Business owners in more educated ZIP codes would theoretically be more likely to be aware of the program and how to apply and/or have business in sectors affected differently by the pandemic (office workers vs. fast food). The effect of higher per capita income would be similar. Because a large portion of the loan amount was required to go to payroll

expenses, ZIP codes with higher levels of wealth inequality may have received more/larger loans in order to combat such inequality. Finally, ZIP codes with higher unemployment rates (prior to the pandemic) may have received a different number/size of loans depending on whether the smaller number of employees had a larger effect than any desire of the SBA to direct funding to underserved markets. All of these measures are taken from the National Historical GIS (NHGIS) which is part of the Integrated Public Use Microdata Series (Manson et al., 2023). Summary statistics for all variables are presented in Table 3.1.

Table 3.1. Summary Statistics

Variable	Mean	Std. Deviation	N	Year
Black Share (%)	7.338	14.877	33,499	2020
White Share (%)	73.976	24.494	33,499	2020
Rural (%)	64.658	44.045	33,499	2020
Rural Indicator	0.625	0.484	33,499	2020
Per Capita Income	31,230.72	14,503.82	32,227	2015-2019
Gini Coefficient	41.505	7.634	31,979	2015-2019
Unemployment Rate	5.407	6.045	32,330	2015-2019
% ≥ Bachelor's	24.541	16.865	32,465	2015-2019
Loans per Emp. Est.: 1	0.13	0.112	32,638	2020-2021
Loans per Emp. Est.: 2	0.234	0.187	32,638	2020-2021
Loans per Emp. Est.: 3	0.462	0.552	32,638	2020-2021
Loans per Emp. Est.: Total	0.825	0.676	32,638	2020-2021
Loan Amount per Emp.: 1	3,043.12	5,013.228	30,771	2020-2021
Loan Amount per Emp.: 2	1,881.202	3,078.1	30,771	2020-2021
Loan Amount per Emp.: 3	3,122.368	5,101.378	30,771	2020-2021
Loan Amount per Emp.: Total	8,046.69	9,379.916	30,771	2020-2021

Note: * denotes that the data is from the 2020 U.S. Census. † denotes that the variable has been generated using data from an otherwise mentioned source. ‡ denotes that the data is an American Community Survey 5-Year Estimate.

4. METHODOLOGY

As described above, in order to investigate loan distribution at the ZIP code level, I use the two outcome variables defined by Fairlie and Fossen (2022): the number of loans a ZIP code receives per employer establishment and the average loan amount per employee in a ZIP code. Histograms of these variables are presented in Figures 4.1 and 4.2. Note that, for the sole purpose of better visualization, the values are winsorized (capped) at 15,000 for the individual tranches and 45,000 for the program as a whole in Figure 4.1 and at 0.5, 1, 2, and 3 for the three tranches (in order) and the program as a whole, respectively, in Figure 4.2. These variables are not winsorized in the regression analysis.

The outcome variables are censored at zero (a ZIP code could not receive a negative number of loans or loans for a negative amount) and are often zero-inflated with the positive values roughly following a bell curve. As I will demonstrate in the next section, I am able to

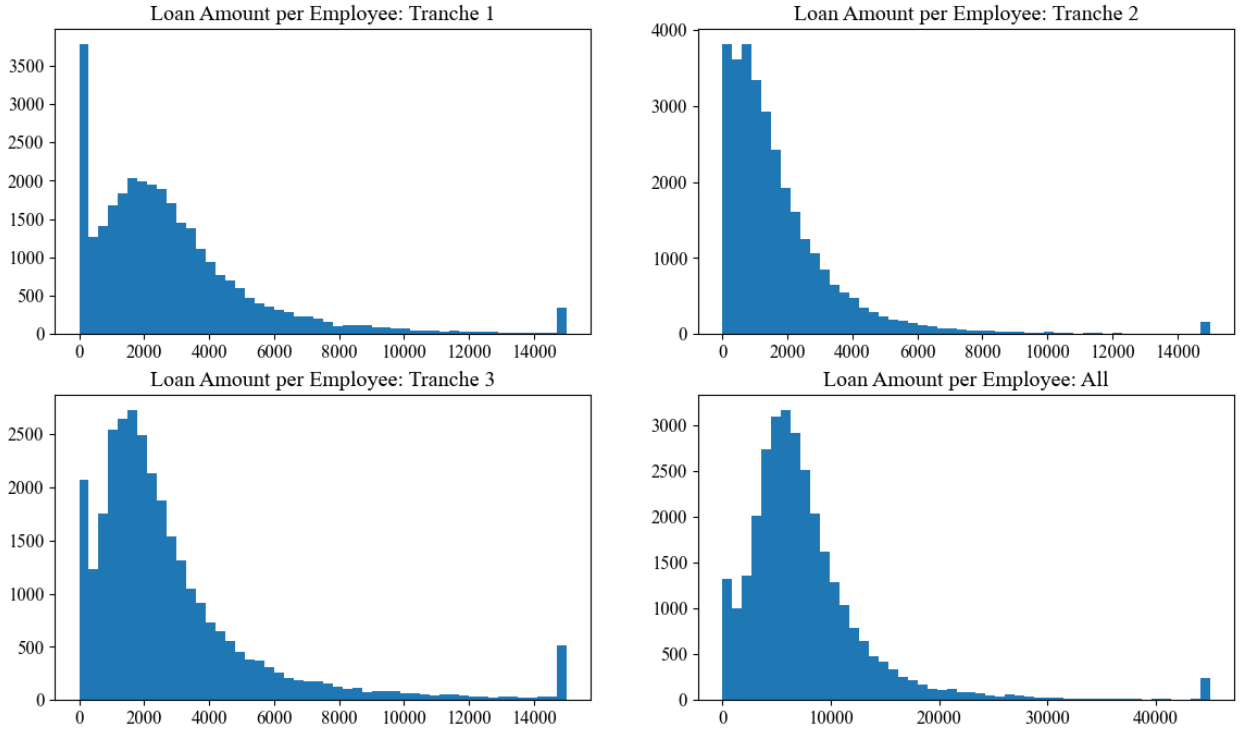

Figure 4.1. Histograms of Mean Loan Amount per Employee

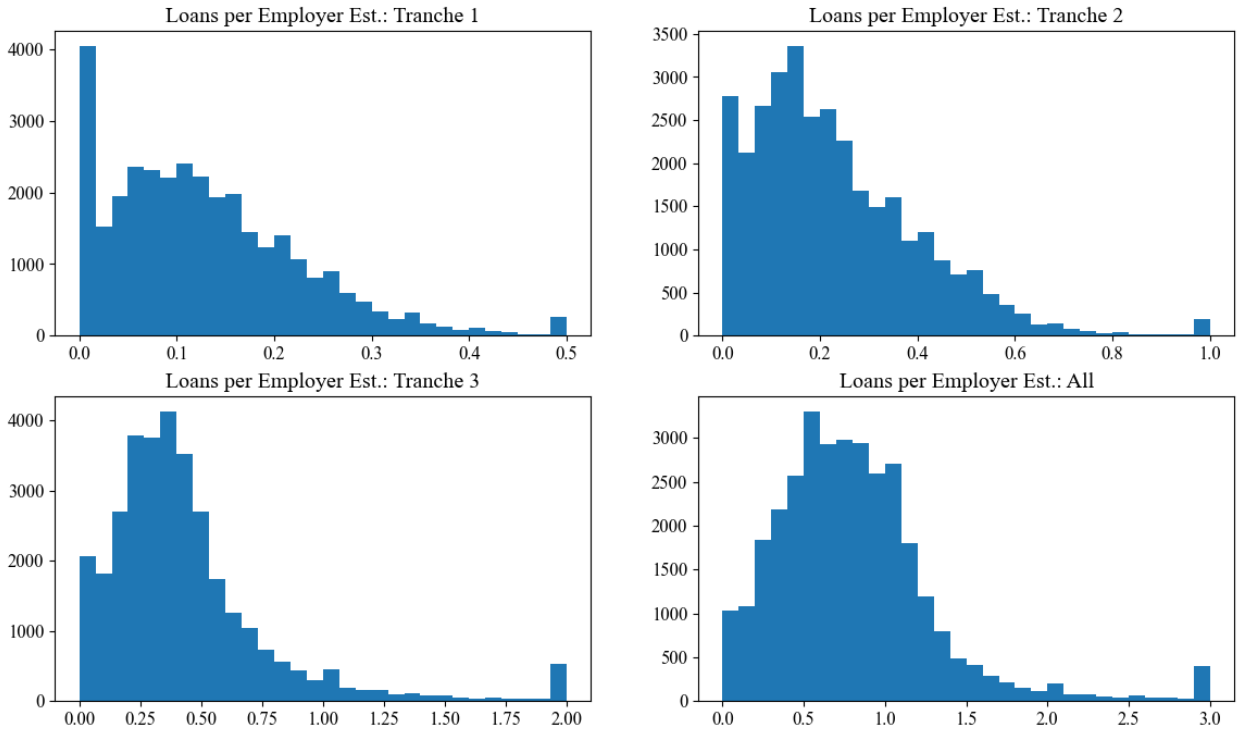

Figure 4.2. Histograms of Number of Loans per Employer Establishment

replicate the results from Fairlie and Fossen (2022) on the first two tranches identically. To account for the non-normality of the distributions of these variables, I could use a Tobit regression to analyze loan distribution. The Tobit model, however, assumes that the relationship between a predictor and whether the outcome variable passes the censoring threshold is identical to the relationship between the predictor and the value of the outcome variable once it has passed the censoring threshold. This, however, may not always be the case. For instance, a ZIP code's per capita income may have a positive relationship with the odds of receiving more than zero loans but a negative relationship with the number of loans per employer establishment due to the government's stated goal of directing funding toward historically underserved markets. The Tobit model would estimate these different relationships as a single relationship.

Another model, the Cragg-hurdle model, does not require this assumption. This two-part regression model first estimates the odds an observation is censored or non-censored (i.e., zero or

positive) and then estimates the relationships between the predictors and the outcome variables using only the observations with the non-zero, positive values. This allows the estimated relationships between the predictors and the odds of receiving any loans (and therefore any loans of positive value) to vary from those between the predictors and the actual positive values of the outcome variables.

While the Tobit model requires an additional assumption, what it estimates (a singular relationship for all ZIP codes) is a valuable insight. I therefore estimate and present the Tobit model in the appendix. The Hurdle model remains my preferred specification.

The first part of the hurdle model is presented in Equation (4.1):

$$s_i = \begin{cases} 1 & if\ \mathrm{z}_i\gamma + u_i > 0 \\ 0 & if\ z_i\gamma + u_i \leq 0 \end{cases} \qquad \text{(Eq. 4.1)}$$

where s_i is a dummy variable which takes the value of 1 if ZIP code *i* receives any positive number of loans (or, analogously, loan amounts greater than zero) and zero otherwise, z_i is a vector of independent variables with coefficients in the vector γ, and u_i is the error term distributed normally with a mean of zero. The value of s_i is estimated using a Probit model formulated $P(s_i = 1) = z_i\gamma + u_i$.

The second part of the hurdle model, estimated using a truncated normal regression, is presented in Equation (4.2).

$$y_i = \begin{cases} x_i\beta + \epsilon_i & if s_i = 1 \\ 0 & otherwise \end{cases} \qquad \text{(Eq. 4.2)}$$

where x_i is a vector of independent, explanatory variables, β is a vector of coefficients, and ϵ_i is the error term distributed normally with a mean of zero.

4.1. Nontraditional Lenders

As mentioned in the literature review, the approval of nontraditional, fintech lenders after the first tranche has been pointed to as a mechanism for the reversal of the preference given to White business owners (in the form of larger loans) during the first tranche. To investigate this at the ZIP code level, I remove loans facilitated by nontraditional lenders from the analysis using the tables provided by Erel and Liebersohn (2020). I then rerun my regressions and compare the results against those from the full sample. If traditional lenders also underwent a shift in loan distribution with regards to race that would provide (further) evidence that the changes made to the program had an effect on loan distribution with regard to race. Even though this is a level-level analysis, I do not expect removing loans from the data to have a confounding, downward effect on my coefficients. For example, were loan distribution evenly distributed, its removal would result in a decreased constant term and identical coefficients. Thus, the constant term should change to accommodate the drop in total funding in my sample, leaving the remainder of my coefficients otherwise unaffected.

4.2. Two-Week Smallest Businesses Application Period

As part of the changes made to the PPP during the third tranche, the Biden-Harris administration enacted a two-week period during which only business with fewer than twenty employees could apply for a PPP loan. To analyze the effects of this period on loan distribution, I conduct two tests. First, I split the third tranche in two based on the enaction of the Biden-Harris Administration's changes to the program, allowing us to compare the coefficients before and after the changes. Second, I run the regression on loans approved during the two-week period as well as three two-week periods on either side (a total of seven regressions), functioning as a quasi-event study. Though the PPP data does not contain application dates, the subsequent

periods would capture any delays in processing that may have occurred. This further decomposition allows us to determine when the changes (if there are any) observed in the first part of this analysis began to occur. Changes originating prior to the enaction of these changes would suggest that another cause was responsible. Given the two-day difference between the announcement and implementation of the two-week exclusive application period, an anticipatory effect extending more than one period before the center period is unlikely.

5. MOTIVATION

Given that the aggregation proposed in Fairlie and Fossen (2022) is my preferred unit of analysis, I begin by applying the unaltered methodology described in their paper to the third tranche (the methodology and data described above differs from theirs in several key ways). This results in the graphs shown below. Figure 5.1 shows the mean Average Loan Amount per Employee for 20 bins of ZIP codes based on the minority shares of their populations. This mean is displayed both unweighted and weighted by the total population of the ZIP codes. Figure 5.2 displays the same for the Number of Loans per Employer Establishment. The results of univariate quadratic regressions are displayed in both figures in dashed lines.

Minority share of the population is negatively associated with loan amounts in the first tranche. This levels out in the second tranche. Though, there is a slight increase with minority share (and this increase is larger when weighting the values by population). The third tranche is perhaps the most nonlinear of the three. Minority share is positively associated with loan amounts, but this is dominated by two large "spikes" at either end of the distribution.

In terms of loan number, the first two tranches are dwarfed by the third. The first tranche sees a negative association between minority share of the population and loan number. This is reversed in the second tranche. Notice also that there is a drop for the bins with the smallest minority share of the population (i.e., the distribution peaks or slows its increase in the mostly-but-not-entirely-White ZIP code bins). During the third tranche, loan number grows exponentially with minority share, reaching numbers triple (or almost quintuple in the case of the weighted measure) anything seen previously.

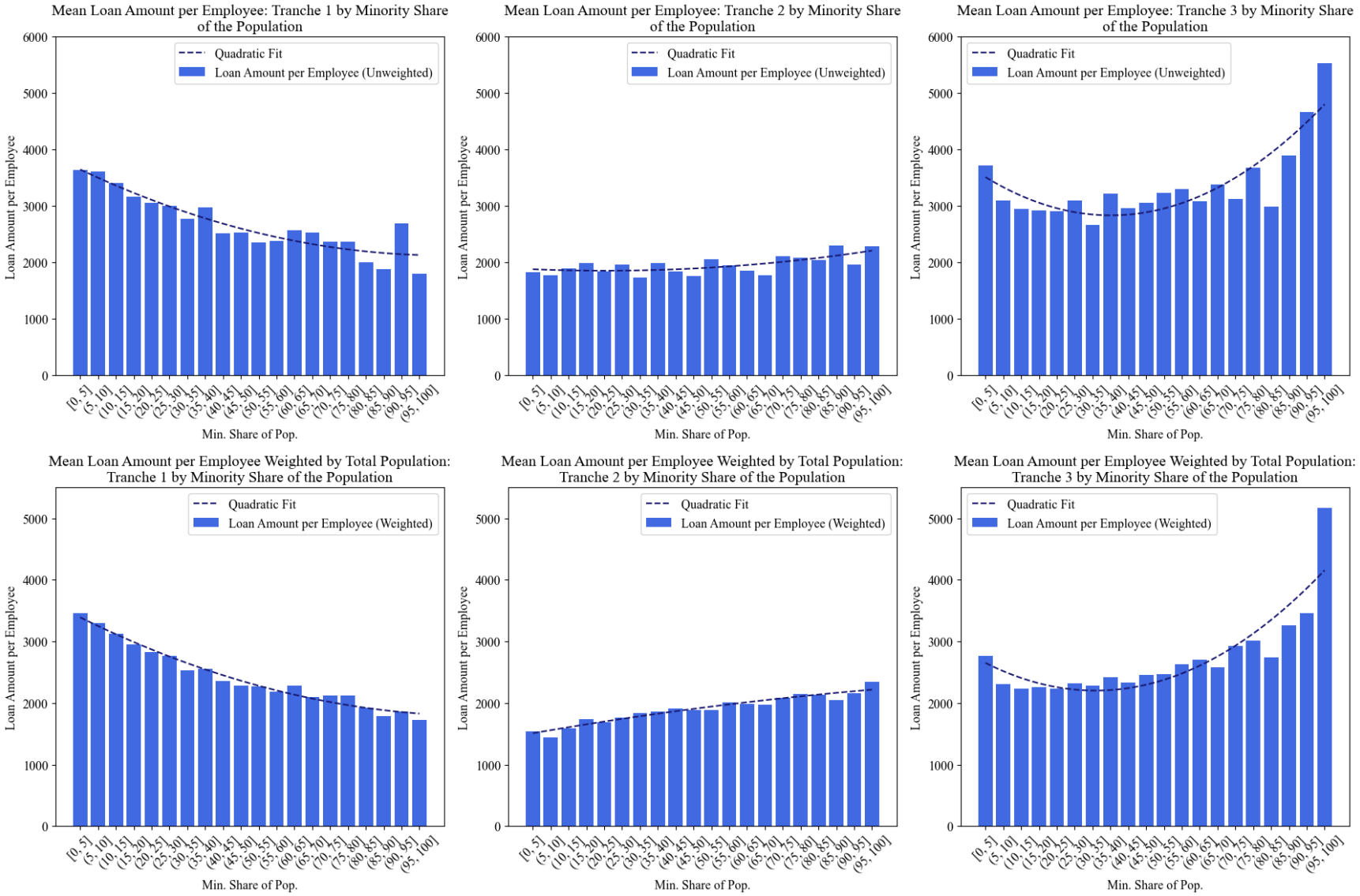

Figure 5.1. Mean Loan Amount per Employee by Minority Share of the Population

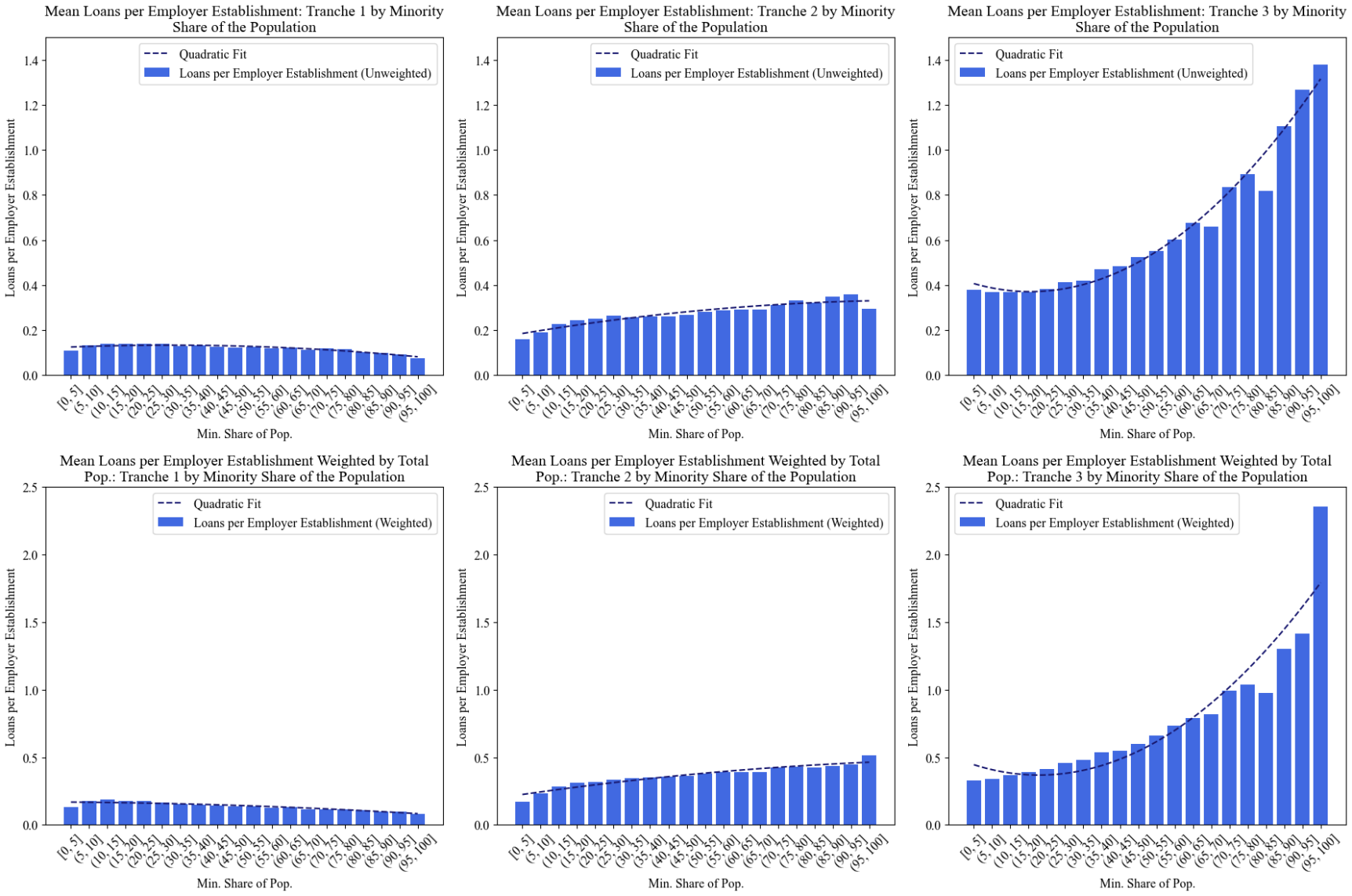

Figure 5.2. Number of Loans per Employee by Minority Share of the Population

Taken together, these figures show that the program's distribution of funds changed drastically between the program's tranches with the third tranche being crucially different in its distribution. While these figures describe the actual and total variation of loan distribution with regard to race, they do not describe what role race actually played. As mentioned above, for instance, the ZIP codes on the lower portion of the x-axis also tend to be more rural. The nonlinearities around this area suggest the possibility of differential treatment between urban and rural majority-White communities, further motivating my inclusion of interactions between my *White Share* variables and a rural indicator. Additionally, the geography (as measured by Census Regions) of the bins changes in accordance with minority share as well. The drastic difference between the third tranche and its predecessors as well as the correlations between race and confounding factors provide additional motivation for conducting the more rigorous analyses described above.

6. RESULTS

Due to the non-linearities in the exogenous variables' relationships with PPP loan receipt, coefficients differ as the value of a predictor changes. Coefficients for *White Share* and *Black Share* are calculated (via the derivative) and interpreted at their population-weighted sample means (the sample is split into urban and rural ZIP codes for *White Share*). However, while interpreting these coefficients at population-weighted means provides a useful description of the relationships the variables of interest have with loan receipt for the average ZIP code, these points (which often fall close to the minimums or maximums of the polynomials being described by the derivatives) do not necessarily describe the most interesting facets of the relationships between demographics and the number of loans received. Additionally, to make the regression tables more readable, I have included only the coefficient estimates for the variables of interest. Full regression results for all results are included in the appendix.

6.1. Number of Loans per Employer Establishment

I begin with the number of loans a ZIP code received per employer establishment. Regression results are presented in Tables 6.1 and 6.2, the derivatives of the variables with nonlinear terms are presented in Table 6.3, and graphs of those derivatives are shown in Figure 6.1.

Graphs like those shown in Figure 6.1 will be utilized throughout the rest of this paper, and it is worthwhile to explain their precise interpretation. Due to the inclusion of non-linear terms in my regression model, the coefficients for my variables change as the values of those variables change. Intuitively, one might think an upward-sloping line indicates a positive relationship, but this is not the case. Instead, it is the position of the line relative to a horizontal line at zero which indicates the direction of the relationship. The slope of the line represents the

Table 6.1. First Stage Coefficients for Number of Loans

Loans per Employer Establishment	Tranche 1	Tranche 2	Trance 3	All
Constant	0.065705	0.341881***	0.127099	0.942891***
	(0.106834)	(0.130558)	(0.161293)	(0.238522)
White Share	0.017173***	0.020506***	0.034241***	-0.005128***
	(0.004334)	(0.005206)	(0.007402)	(0.001020)
White Share^2	-0.000170***	-0.000217***	-0.000359***	0.000023***
	(0.000048)	(0.000058)	(0.000081)	(0.000009)
White Share x Rural Ind.	0.009049**	0.003531	-0.002107	0.005480***
	(0.004589)	(0.005554)	(0.007835)	(0.001230)
White Share^2 x Rural Ind.	-0.000026	0.000036	0.000116	-0.000009
	(0.000050)	(0.000061)	(0.000085)	(0.000012)
Black Share	-0.001357	-0.000612	-0.036534*	0.013312***
	(0.005696)	(0.006785)	(0.019830)	(0.000896)
Black Share^2	0.000046	0.000058	0.001428**	0.000010
	(0.000091)	(0.000107)	(0.000610)	(0.000013)
Black Share x Rural Ind.	0.020492***	0.023435***	0.038503*	0.001108
	(0.006512)	(0.007800)	(0.020336)	(0.001558)
Black Share^2 x Rural Ind.	-0.000281***	-0.000301**	-0.001268**	0.000001
	(0.000103)	(0.000121)	(0.000615)	(0.000025)
N	31,314	31,314	31,314	31,314
Log Likelihood	51601	44703	27512	13548

Note: Table displays coefficient estimates from the first stage of a Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

rate at which the relationship is changing. For instance, a line that lies above zero but slopes downward indicates a positive, decreasing relationship (i.e., decreasing marginal returns to scale). Put simply, these graphs depict the coefficient's value across its predictor's range.

The first part of the Cragg-Hurdle model, which predicts whether an observation has a zero or non-zero value, is shown in Table 6.1. *White Share* in urban areas is positively associated with a ZIP code's chances of receiving more than zero loans (but decreasingly so as *White Share* grows larger) for all three tranches. This is flipped in the overall model: a negative but increasing

Table 6.2. Derivatives of Second Stage Coefficients for Loan Number

Loans per Employer Establishment	Tranche 1	Tranche 2	Trance 3	All
White Share	0.001334***	-0.001688***	-0.003830***	-0.004079***
	(0.000167)	(0.000242)	(0.000555)	(0.000892)
White Share^2	-0.000001	0.000006***	0.000010**	0.000017**
	(0.000002)	(0.000002)	(0.000005)	(0.000008)
White Share x Rural Ind.	0.000900***	0.000699**	0.001328**	0.004839***
	(0.000204)	(0.000321)	(0.000660)	(0.001080)
White Share^2 x Rural Ind.	-0.000013***	0.000003	0.000016**	-0.000008
	(0.000002)	(0.000003)	(0.000006)	(0.000010)
Black Share	0.001518***	0.001592***	0.009401***	0.010530***
	(0.000172)	(0.000233)	(0.000636)	(0.000855)
Black Share^2	-0.000011***	-0.000006**	0.000010	0.000040**
	(0.000002)	(0.000003)	(0.000014)	(0.000016)
Black Share x Rural Ind.	-0.000335	0.002986***	-0.001637*	0.001965
	(0.000281)	(0.000411)	(0.000929)	(0.001396)
Black Share^2 x Rural Ind.	0.000007	-0.000031***	0.000009	-0.000027
	(0.000004)	(0.000006)	(0.000017)	(0.000024)
N	31,314	31,314	31,314	31,314
Mean Outcome	0.13	0.234	0.462	0.825
Log Likelihood	51601	44703	27512	13548

Note: Table displays derivatives of coefficient estimates from the second stage of a Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. The coefficients of a Cragg-hurdle regression are not directly interpretable, and the first derivatives of each variable serve as the coefficient estimate.

relationship. The relationship for *White Share* in rural ZIP codes is mostly the same. *Black Share* is only significantly related to the odds of receiving more than zero loans in the overall model (and positively so). *Black Share*'s relationship with the odds of receiving more than zero loans in rural ZIP codes is decreasingly significantly different from that in urban areas. In the first and second tranches, Rural Black Share has a significantly more positive effect on the odds of receiving more than zero loans than Urban Black Share but a less positive increase.

Table 6.3. Derivatives of Cragg-Hurdle Model for Number of Loans Received

	Urban White Share	Rural White Share
Tranche 1	0.001334 – 0.000002x	0.002234 – 0.000028x
Tranche 2	-0.001688 + 0.000012x	-0.000989 + 0.000018x
Tranche 3	-0.003830 + 0.000020x	-0.002502 + 0.000052x
All	-0.004079 + 0.000034x	0.00076 + 0.000018x
	Urban Black Share	Rural Black Share
Tranche 1	0.001518 – 0.000022x	0.001183 – 0.000008x
Tranche 2	0.001592 – 0.000012x	0.004578 – 0.000074x
Tranche 3	0.009401 + 0.000020x	0.007764 + 0.000038x
All	0.010530 + 0.000080x	0.012495 + 0.000026x

Note: Table displays second derivatives of variables of interest from the second stage of a Cragg-Hurdle regression. Coefficients are included in the derivatives regardless of statistical significance.

The coefficients derived from the second part of a Cragg-Hurdle regression are not directly interpretable, and the derivatives must be taken in order to obtain the true coefficient values. The results of this are shown in Table 6.2. Final derivatives for the nonlinear terms are presented in Table 6.3 and graphed in Figure 6.1.

In urban ZIP codes during the first tranche, the relationship between *White Share* and number of loans received is almost entirely linear. At the mean (53.905%), a percentage-point increase is associated with 0.001227 more loans per employer establishment. In the second tranche, this relationship becomes negative but increases as *White Share* becomes larger (though it never becomes positive). In the third tranche, this relationship becomes even more negative. The relationship when analyzing the program as a whole is largely similar to that in the third tranche, starting negative (at a similar magnitude) but increasing slightly faster as *White Share* becomes larger, nearing zero at the upper end of the range.

White Share's relationship with the number of loans received per employer establishment is markedly different in rural ZIP codes. In the first tranche, the percentage of a rural ZIP code's

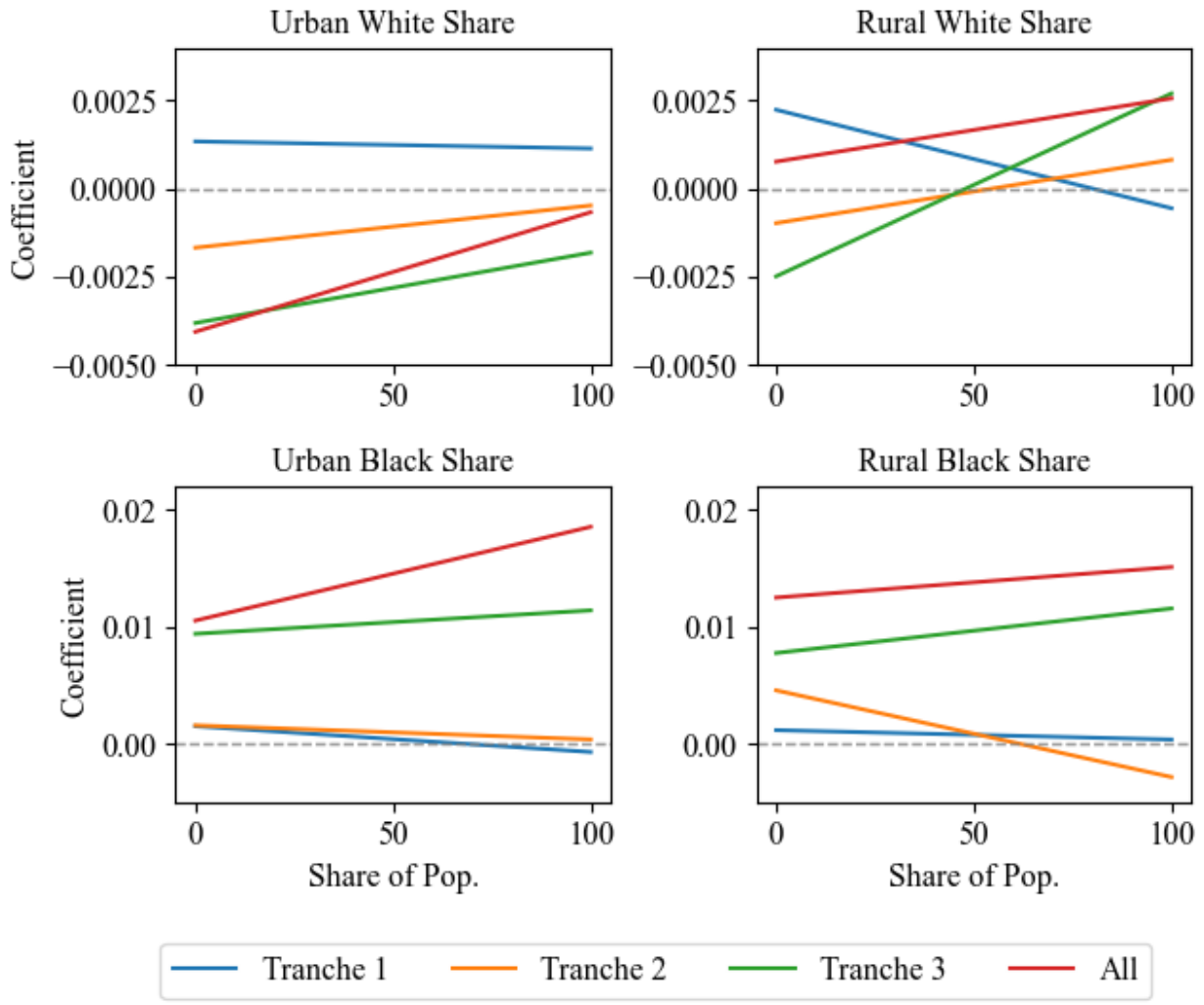

Figure 6.1. Derivatives of Cragg-Hurdle Model for Number of Loans Received per Employer Establishment

population classed as White is positively associated with loan number, but as this percentage increases, the relationship decreases and becomes negative after about 80%. At the mean, an additional percentage point of a rural ZIP code's population is associated with 0.000013 more loans per employer establishment. The relationship in the second tranche is a rough reflection of that in the first, starting negative, increasing, and becoming positive around 60%. This results in 0.000439 more loans per employer establishment for an additional percentage point of a rural ZIP code's population classified as White at the mean, ceteris paribus. The relationship in the

third tranche is a more extreme version of the one in the second, starting several times more negative and ending several times more positive. At the mean, a rural ZIP code could expect 0.001623 more loans per employer establishment for an additional percentage point in the share of its population classified as White, all else equal. Unlike most of the other models, the pattern for the program as a whole looks quite different than in the third tranche. Here, the relationship starts positive and becomes more positive as *White Share* increases. At the mean, an additional percentage point of a ZIP code's population classed as White is associated with 0.002188 more loans per employer establishment.

In urban ZIP codes, the relationship between the share of a ZIP code's population that is Black is positively associated with loan number for most of its range for every tranche and the program as a whole. It is again worth noting that my excluded category is the population share of non-Black minorities. Additionally, this positive relationship only gets more positive as the program goes on. At the mean, an additional percentage point in the share of the population classified as Black is associated with 0.001231 more loans in the first tranche, 0.001436 more in the second, 0.009662 more in the third, and 0.011573 more for the program as a whole in urban ZIP codes.

The only time *Black Share*'s coefficients are significantly different in rural ZIP codes is during the second tranche where, at the mean, a percentage point increase in Black Share is associated with 0.004084 more loans per employer establishment.

6.2. Mean Loan Amount per Employee

I now analyze the second measure of loan receipt at the ZIP code level: mean loan amount per employee. Regression results are presented in Table 6.4 and 6.5, the derivatives of the variables with nonlinear terms in Table 6.6, and graphs of those derivatives in Figure 6.2.

Table 6.4. First Stage Coefficients for Mean Loan Amount per Employee

Mean Loan Amount per Employee	Tranche 1	Tranche 2	Trance 3	All
Constant	0.241**	0.563***	0.121	0.913***
	(0.117)	(0.151)	(0.175)	(0.277)
White Share	0.018***	0.020***	0.041***	0.027***
	(0.004)	(0.005)	(0.008)	(0.010)
White Share2	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
White Share x Rural Ind.	0.005	-0.001	-0.017**	0.000
	(0.005)	(0.006)	(0.008)	(0.011)
White Share2 x Rural Ind.	0.000	0.000	0.000***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share	-0.009	-0.009	-0.055***	-0.080***
	(0.006)	(0.007)	(0.020)	(0.022)
Black Share2	0.000	0.000	0.002***	0.002***
	(0.000)	(0.000)	(0.001)	(0.001)
Black Share x Rural Ind.	0.020***	0.027***	0.062***	0.080***
	(0.007)	(0.009)	(0.021)	(0.024)
Black Share2 x Rural Ind.	-0.000**	-0.000**	-0.002***	-0.002***
	(0.000)	(0.000)	(0.001)	(0.001)
N	29,787	29,787	29,787	29,787
Log Likelihood	-230683	-221848	-237120	-266886

Note: Table displays coefficient estimates from the first stage of a Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

The effects of my predictors on the odds of receiving a loan amount per employee greater than zero are, of course, similar to those of receiving more than zero loans per employer establishment as any positive number of loans would imply a loan size per employee larger than zero. The slight differences are, then, due to data availability lowering the sample count. This portion of the results is not re-interpreted to avoid redundancy.

Table 6.5. Derivatives of Second Stage Coefficients for Mean Loan Amount per Employee

Mean Loan Amount per Employee	Tranche 1	Tranche 2	Trance 3	All
White Share	19.816***	-21.081***	-23.259***	-41.427***
	(5.255)	(3.251)	(4.670)	(10.678)
White Share^2	-0.048	0.072**	0.114**	0.316***
	(0.051)	(0.030)	(0.044)	(0.100)
White Share x Rural Ind.	14.555**	8.227*	7.751	51.274***
	(6.838)	(4.262)	(6.214)	(14.381)
White Share^2 x Rural Ind.	-0.137**	0.014	0.058	-0.272*
	(0.070)	(0.043)	(0.063)	(0.144)
Black Share	-5.999	-12.081***	-14.278***	-45.510***
	(5.648)	(3.242)	(5.377)	(10.699)
Black Share^2	0.159*	0.141***	0.716***	1.291***
	(0.083)	(0.044)	(0.116)	(0.165)
Black Share x Rural Ind.	-12.305	11.695**	12.148	16.886
	(9.808)	(5.887)	(9.093)	(19.793)
Black Share^2 x Rural Ind.	0.083	-0.182*	-0.047	0.010
	(0.158)	(0.093)	(0.168)	(0.327)
N	29,787	29,787	29,787	29,787
Mean Outcome	3,043.12	1,881.202	3,122.368	8,046.69
Log Likelihood	-230683	-221848	-237120	-266886

Note: Table displays derivatives of coefficient estimates from the second stage of a Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. The coefficients of a Cragg-hurdle regression are not directly interpretable, and the first derivatives of each variable serve as the coefficient estimate.

In urban ZIP codes, *White Share*'s relationship with loan size begins positive and decreases minutely as *White Share* increases during the first tranche. At the mean, a percentage-point increase in the share of a ZIP code's population classified as White is associated with $14.64 larger loans per employee. The second and third tranches are largely similar to each other. Both begin negative and are about identical in magnitude and increase as *White Share* increases (though, this increase is somewhat faster in the third tranche). An additional percentage point of a ZIP code's population classified as White is associated with $13.32 smaller loans in the

Table 6.6. Derivatives of Cragg-Hurdle Model for Mean Loan Amount per Employee

	Urban White Share	Rural White Share
Tranche 1	19.816 – 0.096 x	34.371 – 0.370x
Tranche 2	-21.081 + 0.144x	-12.854 + 0.172x
Tranche 3	-23.259 + 0.228x	-15.508 + 0.344x
All	-41.427 + 0.632x	9.847 + 0.088x
	Urban Black Share	Rural Black Share
Tranche 1	-5.999 + 0.318x	-18.304 + 0.484x
Tranche 2	-12.081 + 0.282x	-0.386 – 0.082x
Tranche 3	-14.278 + 1.432x	-2.130 + 1.338x
All	-45.510 + 2.542x	-28.624 + 2.602x

Note: Table displays second derivatives of variables of interest from the second stage of a Cragg-Hurdle regression. Coefficients are included in the derivatives regardless of statistical significance.

second tranche and $10.97 smaller loans in the third tranche. The relationship in the program as a whole begins more negative than in the second and third tranches but increases faster, becoming positive after the 60% mark. This results in $7.36 smaller loans for an additional percentage point of a ZIP code's population classified as White in the overall program at the mean, ceteris paribus.

White Share's relationship with loan size in rural ZIP codes is somewhat similar to its relationship in urban ZIP codes. There is no significant difference during the first tranche, and the second and third tranches differ (from the urban relationship) only in their starting points. The most significant difference occurs for the program as a whole in that it closely follows the first tranche (as opposed to the second and third). This results in $16.83 larger loans per employee in the overall program for an additional percentage point of the population classified as White at the mean in rural ZIP codes.

In urban ZIP codes, *Black Share*'s relationship with loan size follows its previous pattern: relatively small coefficients in the first and second tranches followed by relatively larger,

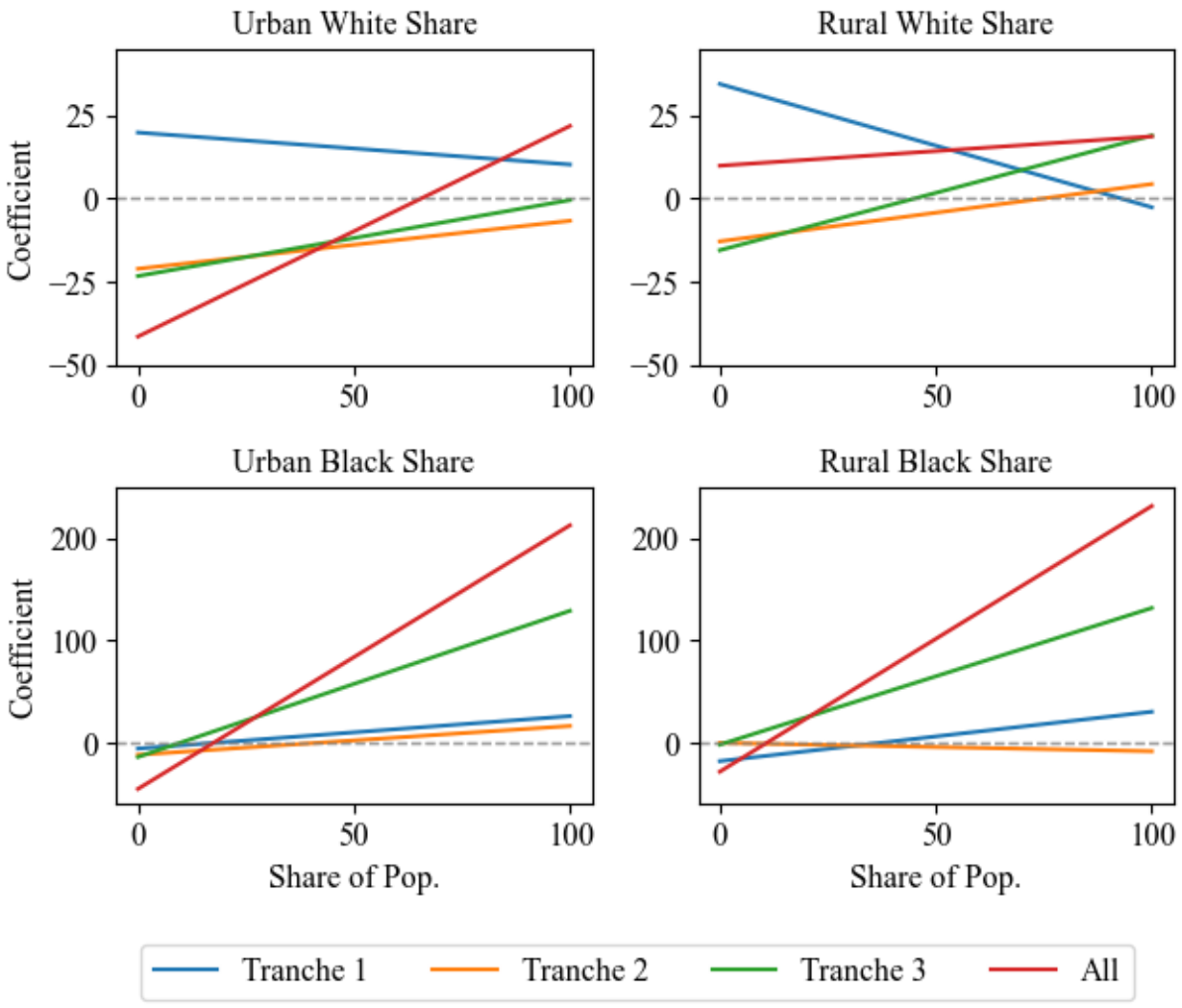

Figure 6.2. Derivatives of Cragg-Hurdle Model for Mean Loan Amount per Employee

positive coefficients in the third tranche and program as a whole. In the first and second tranches, an additional percentage point of a ZIP code's population classified as Black is associated with $1.85 and $8.41 smaller loans per employee at the mean. This rises in the third tranche to $4.39 larger loans per employee at the mean. While an additional percentage point is associated with $12.38 smaller loans per employee in the program as a whole at the mean, for majority-Black, urban ZIP codes, this rises to between $81.59 and $208.69 larger loans per employee, ceteris paribus. *Black Share*'s coefficients are only significantly different in rural ZIP codes during the

second tranche where a percentage point increase is associated with $0.93 smaller loans per employee.

6.3. Traditional Lenders Only

The approval of nontraditional, fintech lenders during the second tranche has been investigated as a possible mechanism for the mitigation/reversal of the preference for White business owners during the first tranche (see Atkins et al., 2022). To investigate the same at the community level, I remove loans made by nontraditional lenders from the sample. If the pattern persists, that would indicate that some other mechanism was (at least partly) responsible. Note that this method does not rule out the approval of nontraditional lenders as a mechanism just its exclusivity.

To do this, I use the classifications provided by Erel and Liebersohn (2020) and exclude loans from the aggregation if the name of the listed lender matches the names in the tables in Erel and Liebersohn's Appendix B (after accounting differences like abbreviation). This is likely not foolproof, and it is probable that some loans failed to be excluded due to potential typos or other inconsistencies in naming. Due to the sheer number of loans that have traditional lenders, however, I believe the effect of such failures to be minimal.

Rerunning the regressions on this subsample of loans results in the derivatives displayed in Tables 6.7 and 6.8. The derivatives of the Cragg-hurdle model are graphed in Figures 6.3 and 6.4 with the derivatives from the full sample in dotted lines of the same color. Full regression results are presented in the appendix.

Looking at loan number, *White Share* in urban ZIP codes has a much less negative association in later tranches. The first tranche remains largely the same when compared to the full sample of loans, and the second tranche is slightly more positive but retains the same

Table 6.7. Derivatives of Second Stage Coefficients for Number of Loans – Traditional Lenders Only

Loans per Employer Establishment	Tranche 1	Tranche 2	Trance 3	All
White Share	0.001290***	-0.001005***	-0.001624***	-0.000840
	(0.000170)	(0.000201)	(0.000390)	(0.000691)
White Share^2	-0.000000	0.000004**	0.000005	0.000005
	(0.000002)	(0.000002)	(0.000003)	(0.000006)
White Share x Rural Ind.	0.001016***	0.000383	0.000289	0.002658***
	(0.000204)	(0.000272)	(0.000489)	(0.000872)
White Share^2 x Rural Ind.	-0.000015***	0.000003	0.000013***	-0.000002
	(0.000002)	(0.000003)	(0.000005)	(0.000008)
Black Share	0.001548***	0.000921***	0.001364***	0.002124***
	(0.000175)	(0.000188)	(0.000480)	(0.000665)
Black Share^2	-0.000011***	-0.000006**	0.000053***	0.000062***
	(0.000002)	(0.000002)	(0.000012)	(0.000014)
Black Share x Rural Ind.	-0.000597**	0.002609***	-0.000214	0.002794**
	(0.000280)	(0.000352)	(0.000692)	(0.001102)
Black Share^2 x Rural Ind.	0.000010**	-0.000022***	-0.000011	-0.000033
	(0.000004)	(0.000005)	(0.000014)	(0.000020)
N	31,314	31,314	31,314	31,314
Mean Outcome	0.126	0.203	0.35	0.678
Log Likelihood	51636	47682	33367	18038

Note: Table displays derivatives of coefficient estimates from the second stage of a Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. The coefficients of a Cragg-hurdle regression are not directly interpretable, and the first derivatives of each variable serve as the coefficient estimate.

direction and movements as the full sample. The relationship in the third tranche, however, is less than half the magnitude of that from the full sample.

In the first two tranches, loan number's association with *White Share* in rural ZIP codes for traditional lenders only is almost identical to that in the full sample. In the third tranche, the same, however, is much less negative when *White Share* is small but also less positive when

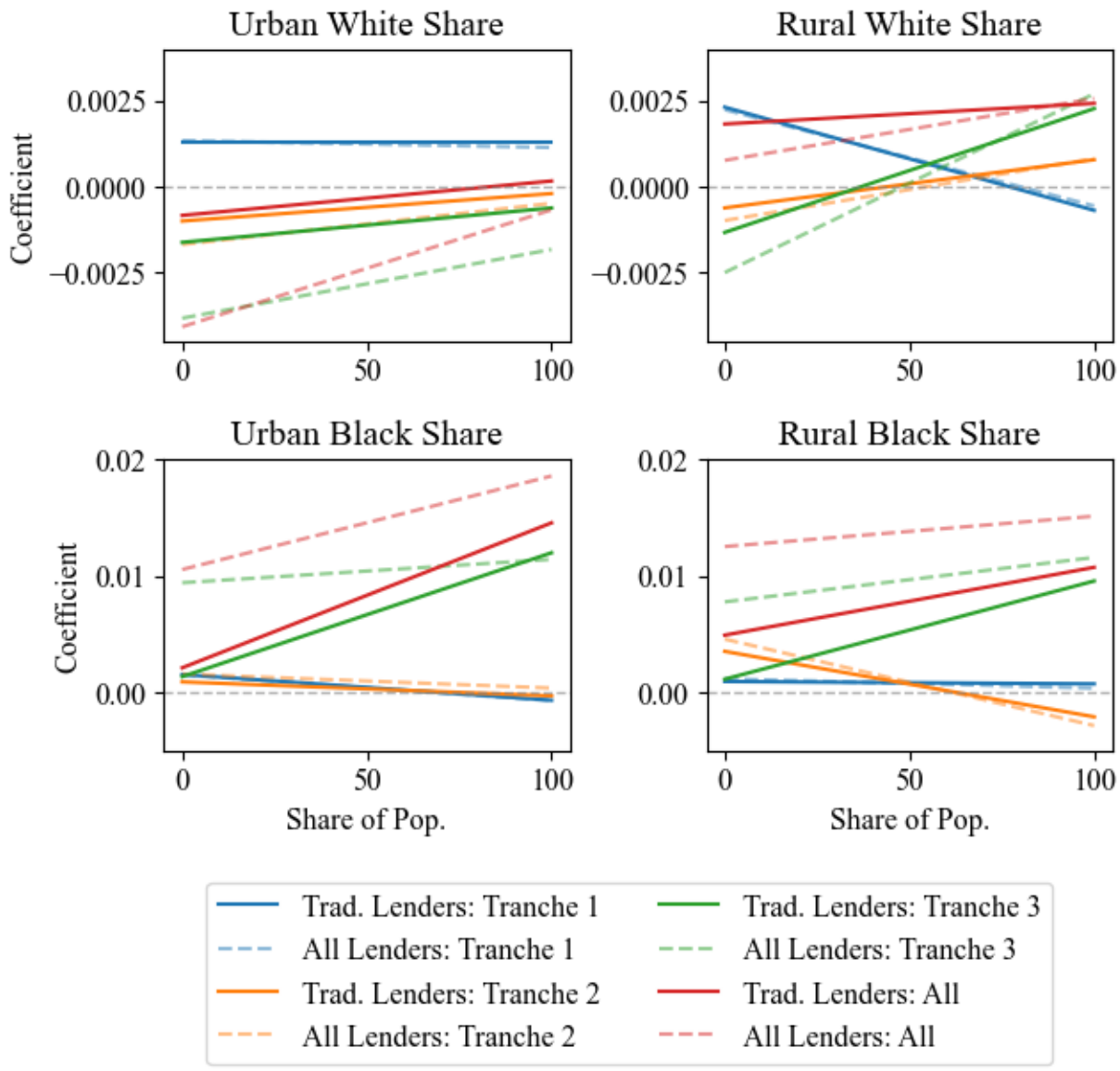

Figure 6.3. Derivatives of Cragg-Hurdle Model for Number of Loans – Traditional Lenders Only

White Share is large. Majority-White, rural ZIP codes, it seems, relied on nontraditional lenders later in the pandemic more than similar urban ZIP codes.

Similarly, *Black Share*'s relationship with loan number from traditional lenders in both urban and rural ZIP codes differs from the full sample most markedly in the third tranche. While the first and second tranches are nearly identical to their full sample counterparts, the

Table 6.8. Derivatives of Second Stage Coefficients for Mean Loan Amount per Employee – Traditional Lenders Only

Mean Loan Amount per Employee	Tranche 1	Tranche 2	Trance 3	All
White Share	20.283***	-17.310***	-15.161***	-28.862***
	(5.268)	(2.856)	(4.105)	(10.028)
White Share^2	-0.040	0.064**	0.090**	0.286***
	(0.051)	(0.027)	(0.039)	(0.094)
White Share x Rural Ind.	16.302**	6.765*	6.941	43.955***
	(6.808)	(3.870)	(5.544)	(13.683)
White Share^2 x Rural Ind.	-0.169**	0.010	0.031	-0.255*
	(0.070)	(0.039)	(0.057)	(0.138)
Black Share	-4.599	-11.854***	-32.046***	-57.823***
	(5.774)	(2.932)	(4.830)	(10.301)
Black Share^2	0.148*	0.104***	0.721***	1.098***
	(0.085)	(0.040)	(0.113)	(0.168)
Black Share x Rural Ind.	-17.090*	8.493	-2.169	5.381
	(9.774)	(5.491)	(8.137)	(18.985)
Black Share^2 x Rural Ind.	0.135	-0.139	-0.030	-0.138
	(0.157)	(0.089)	(0.156)	(0.321)
N	29,787	29,787	29,787	29,787
Mean Outcome	2,983.82	1,722.136	2,723.671	7,429.627
Log Likelihood	-229637	-218700	-232716	-264604

Note: Table displays derivatives of coefficient estimates from the second stage of a Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. The coefficients of a Cragg-hurdle regression are not directly interpretable, and the first derivatives of each variable serve as the coefficient estimate.

relationship in the third tranche begins comparatively small. It increases with *Black Share*, however, and nears the coefficient from the full sample for entirely Black ZIP codes.

These results are quite similar when looking at loan amounts. Across the board, coefficients in the first and second tranches are nearly identical to those in the full sample model. For *White Share*, the removal of loans from nontraditional lenders boosts coefficients upward during the third tranche and program as a whole in both urban and rural ZIP codes (though the

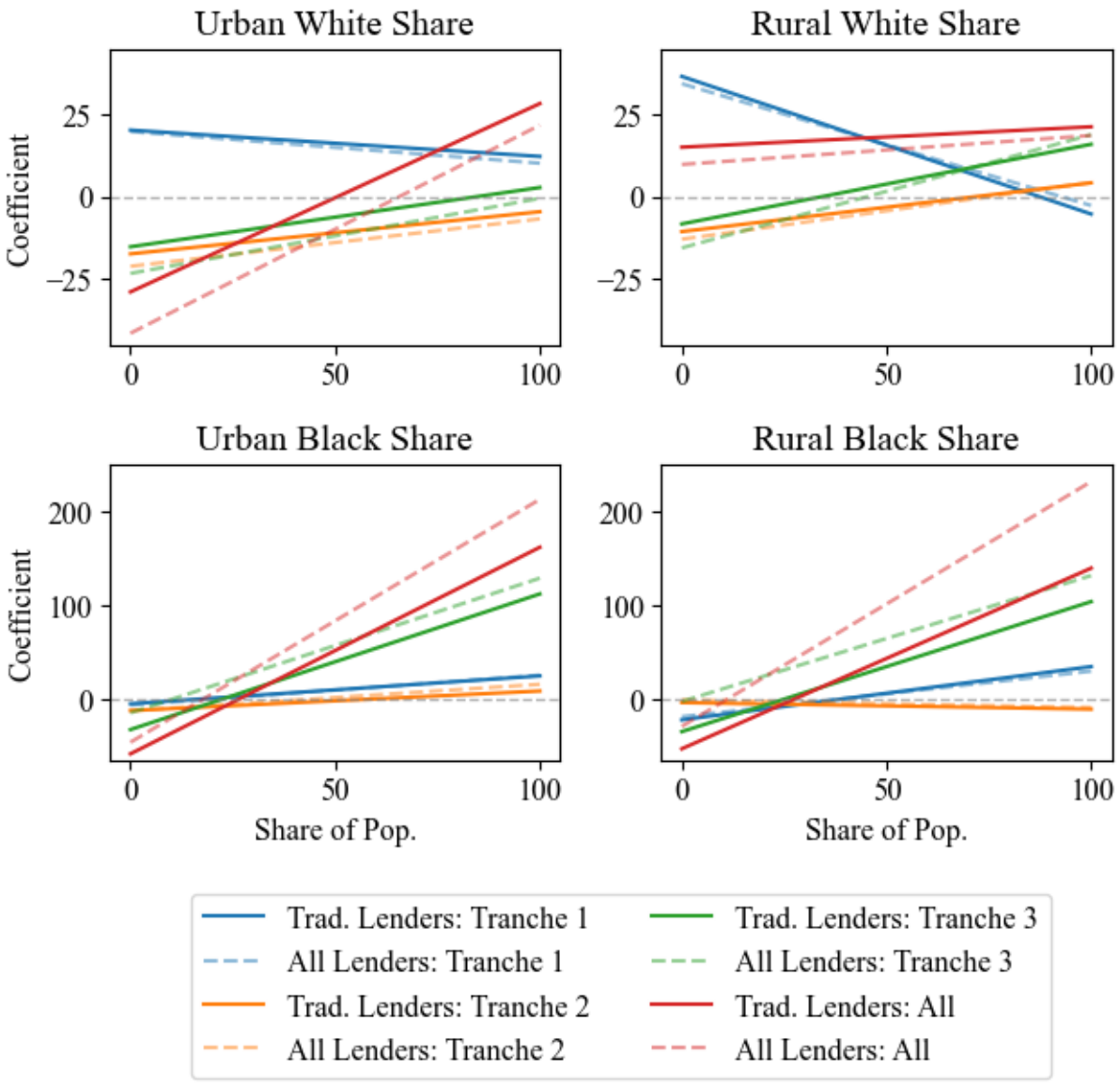

Figure 6.4. Derivatives of Cragg-Hurdle Model for Mean Loan Amount per Employee – Traditional Lenders Only

effect is somewhat larger in urban ones). For *Black Share*, the removal of loans from nontraditional lenders has the opposite effect, lowering coefficients in the third tranche and full program. This deflating of the coefficients is greater for rural ZIP codes, indicating a greater benefit from nontraditional lenders in those areas.

6.4. Two-Week Exclusive Application Period

Figures 6.5 and 6.6 show the coefficients for *White Share* and *Black Share* in urban and rural ZIP codes before and after February 24th, 2021. There are drastic differences in the coefficients for each variable before and after the changes made to the program. As a rule, the coefficients for *White Share* in both urban and rural areas go from those that resemble earlier tranches to those that look much more like the third tranche when analyzed as a whole. For loan

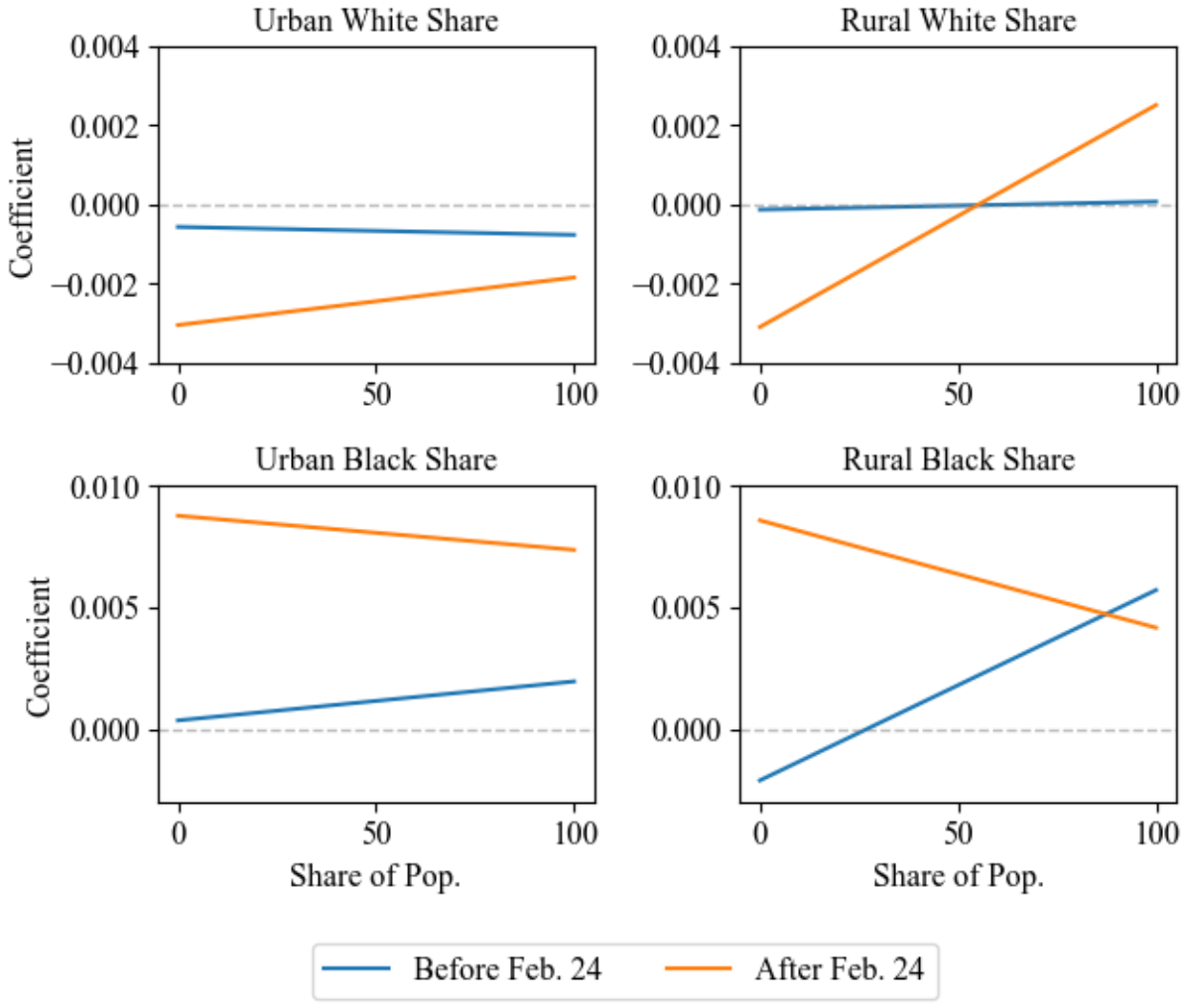

Figure 6.5. Derivatives of Cragg-Hurdle Model for Loan Number – Before and After Feb. 24th, 2021

number, the coefficients for White share of the population in urban ZIP codes become much more negative. Those for White share of the population in rural ZIP codes start much more negative but increase at such a rate that they end almost the same amount more positive than before February 24th. The coefficients for *Black Share* in urban and rural ZIP codes go from starting negative and increasing to starting enormously positive and decreasing, reflecting an overall increase in the coefficients. Things are a bit simpler for loan amounts. Coefficients for *White Share* in urban ZIP codes become almost uniformly more negative (by around $10). Those

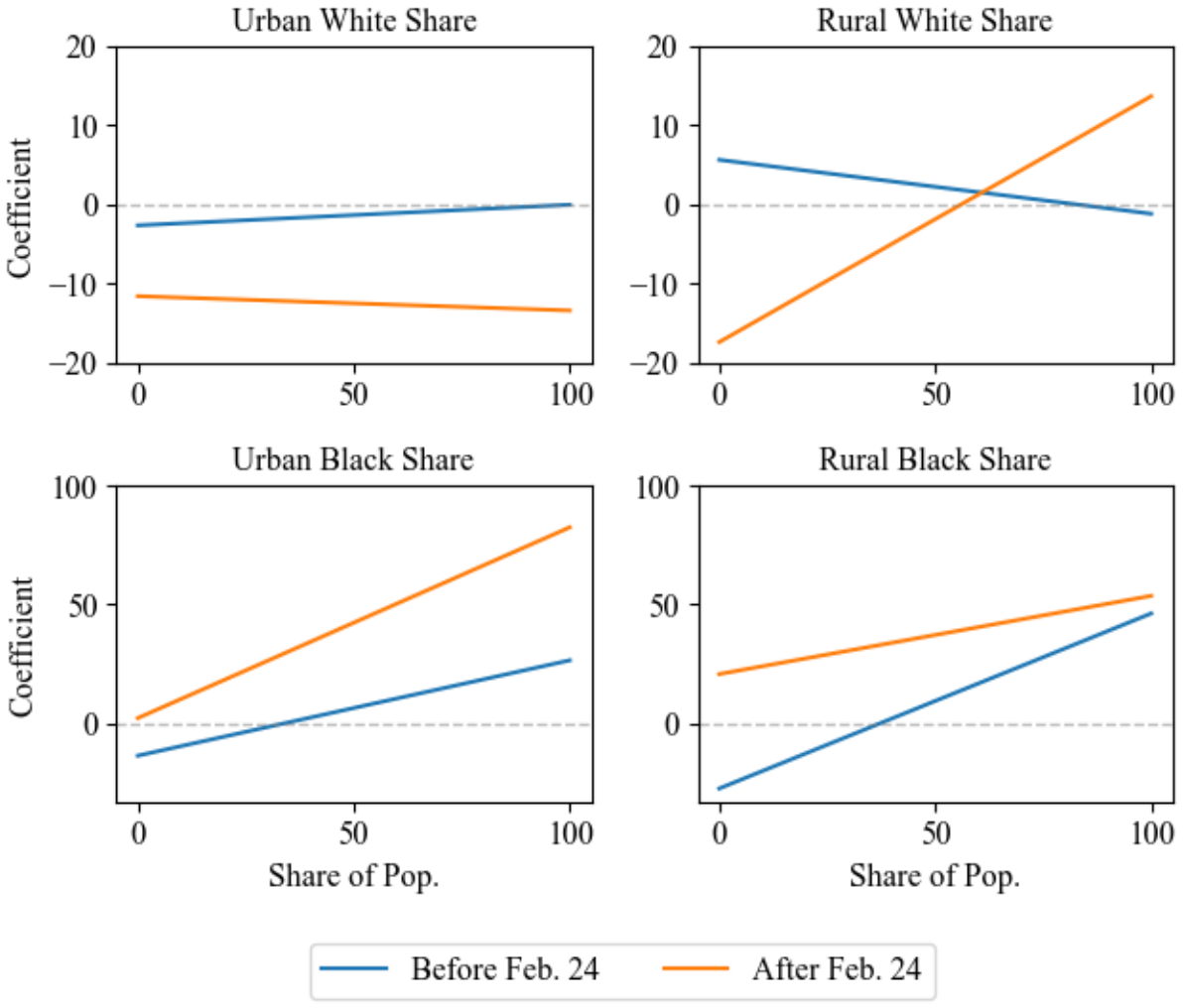

Figure 6.6. Derivatives of Cragg-Hurdle Model for Loan Amount – Before and After Feb. 24th, 2021

for *White Share* in rural ZIP codes become more negative by around $20 initially but are $15 more positive at the top end of *White Share*'s range. Coefficients for *Black Share* become more positive than they were negative before February 24th and remain more positive throughout.

Figures 6.7 and 6.8 show the coefficients for Urban White Share, Rural White Share, Urban Black Share, and Rural Black Share across seven two-week periods, the middle of which (termed "Period 0") is the period during which only businesses with less than 20 employees could apply for a loan.

Predicting loan number, the coefficients for Urban White Share are consistently negative across its range for every period except the first (where it begins slightly positive but quickly goes negative). The coefficients for Rural White Share begin negative in Periods -3 and -2 but increase at the high end (and decrease at the low end) of Rural White Share's range over the course of the next 5 periods, increasing in magnitude along the way. The coefficients for Urban Black Share display a monotonous pattern over the course of the seven periods. In the earliest two periods, the coefficients for Black Share start out near zero but increase quickly, ending significantly positive. This levels out over the next three periods with the exclusive application period being almost completely flat before starting more and more positive and decreasing faster and faster in the later periods. Rural Black Share largely follows this pattern but begins more negative (and ends more positive) in the first two periods. It is noteworthy that the period in which business size was explicitly considered is the period in which the coefficients have some of (if not) the smallest differences and magnitudes. The coefficients when predicting loan amounts, though they have some key differences in direction and movement, tell a similar story with regards the exclusive application period having the smallest differences between coefficients as well as some of the smallest coefficients across the board. Finally, it is

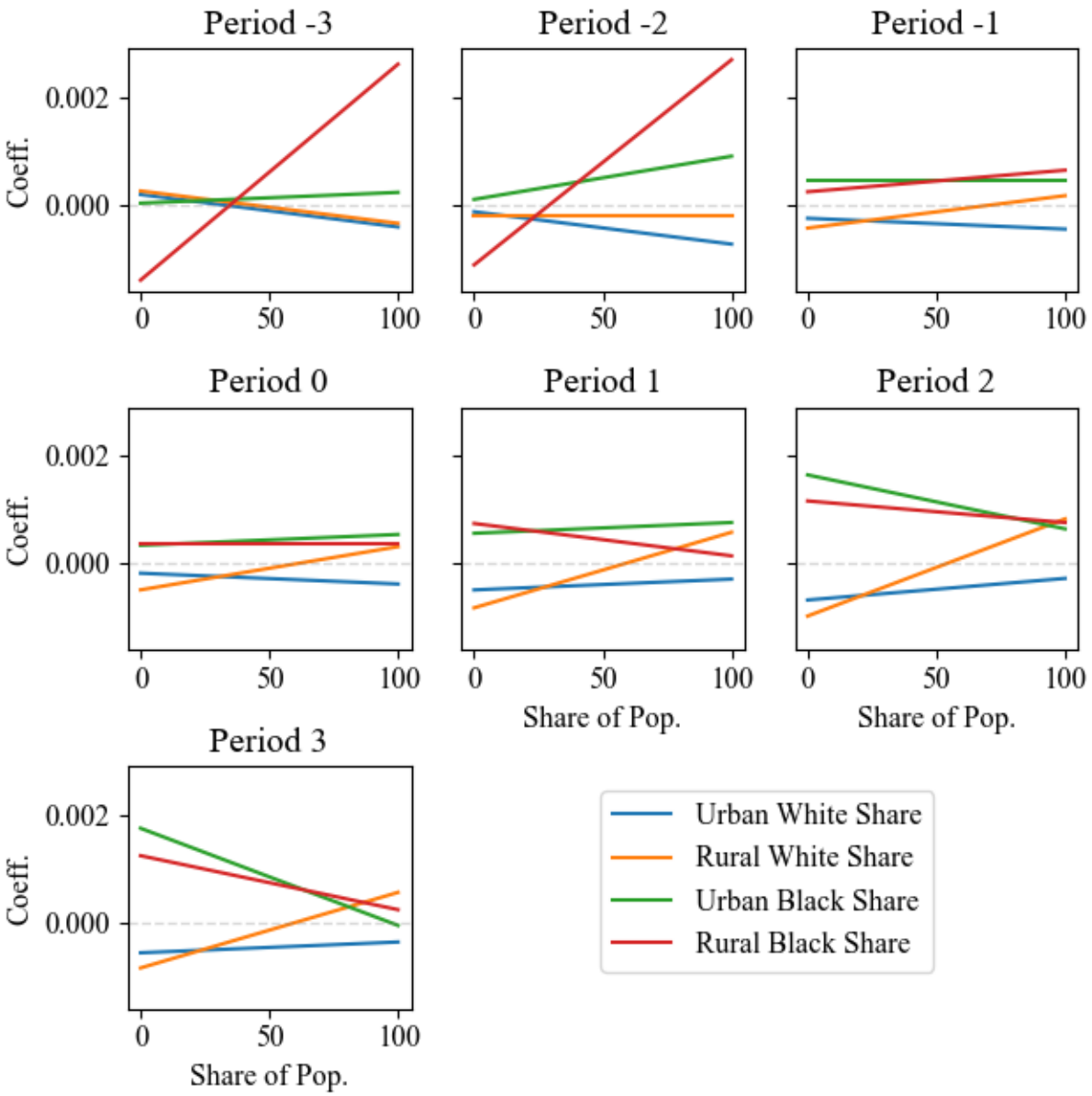

Figure 6.7. Derivatives of Cragg-Hurdle Model for Loan Number – Seven Two-Week Periods

noteworthy that the changes in the coefficients began before the actual implementation of the changes to the program (there are notable differences as early as the first tranche). Given these changes were announced a mere couple of days before going into effect, an anticipatory effect is unlikely, leaving the cause of these shifts presently unclear. I leave this to future researchers.

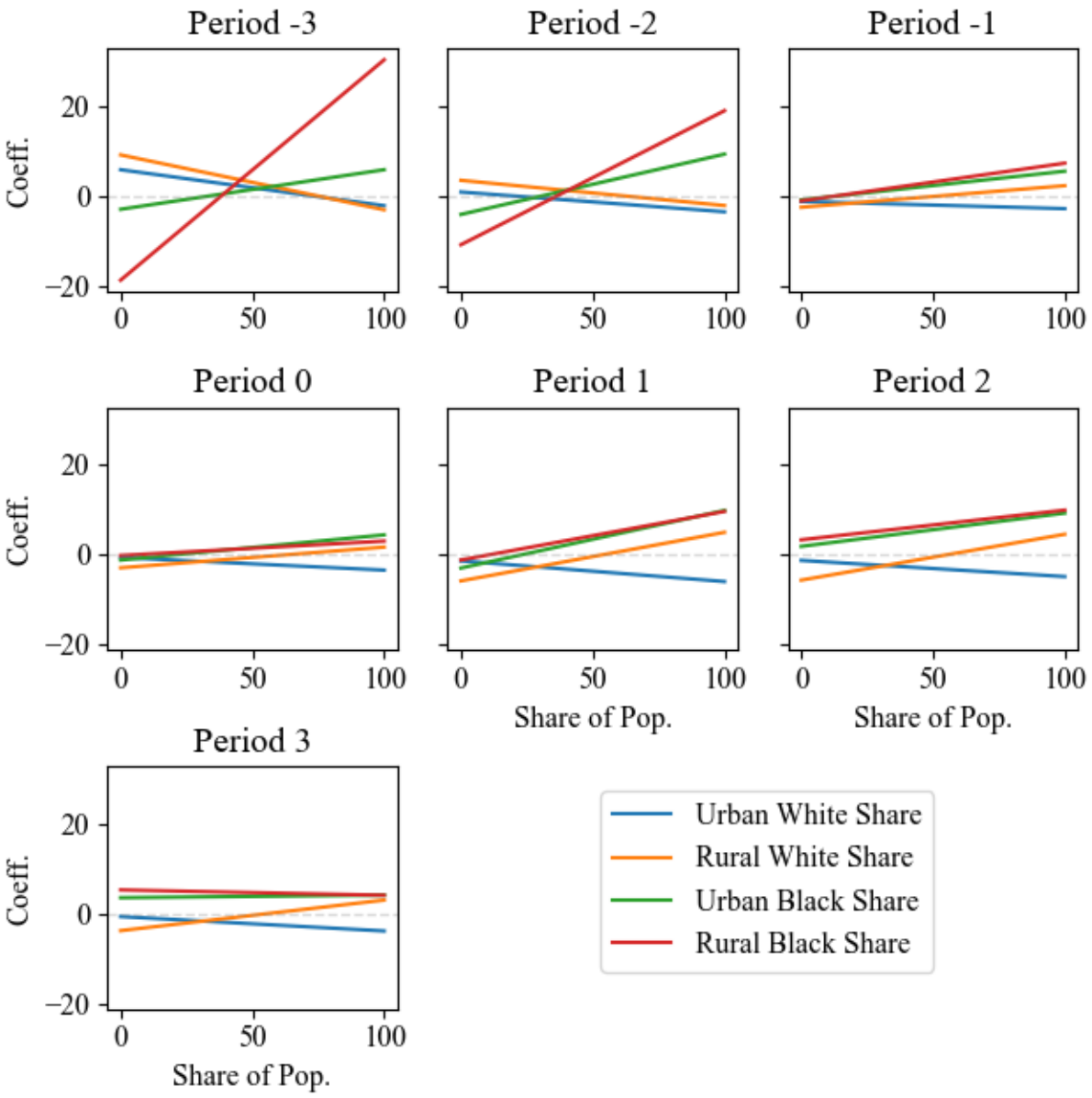

Figure 6.8. Derivatives of Cragg-Hurdle Model for Loan Amount – Seven Two-Week Periods

7. DISCUSSION

My findings in the first two tranches are largely consistent with the previous literature. I find a positive relationship between a Whiter population in urban areas and number of loans received per employer establishment and loan amounts per employee in the first tranche, but a mostly negative association for the same in the second tranche. One difference that I find is that *Black Share* is mostly positively associated (with similar magnitudes to *White Share*) with loan number and size in both of the first two tranches (compared to the 50% smaller loans in Atkins et al. (2022)). These results are not inherently contradictory, however, as it is possible for businesses in areas with a higher Black population to receive more and larger loans but for Black-owned business to still receive smaller ones. Splitting the effects of our predictors by rurality reveals significant differences. *White Share* in rural ZIP codes was not as negatively associated with loan receipt in the second and third tranches as in urban ZIP codes, making *White Share* in rural ZIP codes positively associated (and increasingly so) with both metrics of loan receipt in the program as a whole.

My main area of interest, the third tranche, is the most distinct of the tranches. For *Black Share* in urban ZIP codes, the third tranche brings the largest coefficients in any of the four variables of interest for an individual tranche. The coefficient for loan number is consistently around 2% of the mean outcome (0.01 more loans per employer establishment), and the coefficient for loan size reaches more than $128 per employee (around 4% of the mean). Keep in mind that this metric measures the sum of all PPP funding in a ZIP code divided by the full number of employees in that ZIP code (regardless of whether their employer received a loan. The third tranche (for the most part) also sets the tone for the program as a whole, indicating that the results of the previous investigations into the inequities of loan distribution which did not include

the third tranche are no longer representative of the program as a whole. The racial disparities found in the first and second tranches are relatively small compared to those in the third tranche and the entire program, but the delay in this funding to Black communities almost certainly caused irreparable damage that later funding may not be able to make up for. However, it is noteworthy that even the largest coefficients in my results may not be economically significant. 0.0185 loans per employer establishment and $212.92 per employee (the two largest coefficients both of which are for *Black Share* in urban ZIP codes during the full program) are still quite small. Though these numbers are substantially "deflated" by all those businesses which did not receive any loans, so precisely determining the economic significance of these numbers is challenging.

Removing nontraditional lenders from the sample goes mostly as expected. There is little difference in the coefficients during the first tranche, small differences in the second, and relatively large differences in the third. For *White Share*, the removal of nontraditional lenders boosts coefficients upwards, reflecting a relatively smaller reliance on nontraditional lenders in Whiter areas. The largest effects are on *Black Share*. As expected, based on the previous literature, removing loans from nontraditional lenders results in more negative coefficients across the board. The pattern of the directions and magnitudes of the coefficients, however, remains intact.

Comparing the results before and after the changes made by the Biden-Harris administration reveals striking differences. Coefficients before the changes look much more like those in previous tranches, and those after the changes are more extreme versions of those in the first part of the third tranche. Further breaking down the third tranche into two-week periods centered on a window during which only the smallest businesses could apply yields extremely

interesting results. There are significant differences in the coefficients for the portion of the population classified as White in urban and rural areas as well as for the portion of the population classified as Black in the periods leading up to and following the exclusive application window, but these differences (and the magnitudes of the coefficients themselves) are drastically reduced during this period. It is not immediately obvious why limiting business size in this way should affect the coefficients in this manner, and it would be worthwhile for future research to work toward understanding this shift. Additionally, the fact that these shifts begin before the changes were made suggests the changes made by the Biden-Harris Administration were not the sole cause of the different relationships observed when splitting the third tranche in two.

My results are limited by a number of factors. Primarily, I cannot say that the coefficients estimated herein are not impacted by unaccounted-for confounding factors; I am unable to analyze an experiment, natural or otherwise. I also do not have data on denied applications, an important part of the data. Data on denied applications would provide much stronger evidence of statistical discrimination in the program, but Autor et al.'s (2022) estimation that 94% of firms with fewer than 500 employees had received loans by the end of the second tranche would suggest the effects of this lack of data to be minimal. Finally, given the distribution of reported races across the tranches (see the appendix), it may be that my results are due to differences in application timing rather than discrimination by lenders or the SBA (though such a case would be problematic in its own right and other studies have found that Black- and minority-owned business were less likely to have their applications approved).

8. CONCLUSION

Racial inequities during the third tranche of the pandemic not only look drastically different than those in the first two tranches but largely define the program as a whole. I find that during the third tranche, Black share of the population is associated with both loan number and amount (aggregated the ZIP code) at positive rates unprecedented in magnitude during the earlier tranches. Removing the effects of nontraditional lenders reveals they played a large part in this change. I am (to the best of my knowledge) the first to separately study the role of White and Black share of the population in urban and rural areas on this topic. I find significant differences in the coefficients both in the individual tranches and (especially) in the full program for White share. In general, rural White share was less beneficial to loan receipt in the first tranche and less negatively associated with loan receipt in the second and third tranches, resulting in an overall positive relationship (compared to a negative one in urban ZIP codes). Again, removing the effects of nontraditional lenders suggests they too played a part in boosting White share of the population's relationship with loan receipt. I further study the third tranche by estimating my regressions both across several time periods and before and after the changes made by the Biden-Harris Administration. This reveals striking differences in inequities before and after the start of the White House's changes, but the analysis using more and smaller time periods reveals these shifts started before the announcement of the changes to the program's rules.

Much attention in the literature has focused on the program's racial inequities in funding distribution during the first and second tranches, but the effects of the third tranche on the full program have created the need for an updated literature on this subject. It is worth noting, however, that even if prior inequities were corrected, the delay in funding until much later into

the pandemic almost certainly caused irreparable damage to the small businesses and workers in those ZIP codes that later funding could not make up for.

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APPENDIX A

Figure A1 displays the shares of loans which reported race for each racial group (in blue) compared against the percentages of the same categories out of the U.S. population (in red). In terms of relative size, White loan recipients had the largest share of loans reporting race in all three tranches, taking up over half across the program as a whole. Whites are overrepresented in the first tranche but become underrepresented in the second and third tranches as well as the program as a whole. Blacks and African Americans start off severely underrepresented but hold a share of loans reporting race more than double their share of the U.S. population in the third tranche. It is worth noting that during the third tranche, the section of the form requesting information on business-owner race and ethnicity was moved to the front of the application.

While the over- and under-representation of these racial groups largely mirror the positive and negative relationships of the share of these racial groups in a ZIP code's population with the two measures of loan receipt, it is important to remember that these are measuring two different groups: loan applicants (business owners) and demographics. The positive relationship between one's race and the demographics of their location, however, makes the possibility that differences in application timing combined with the differences in funding between the tranches a possible and likely confounding factor which cannot be accounted for in our regression results.

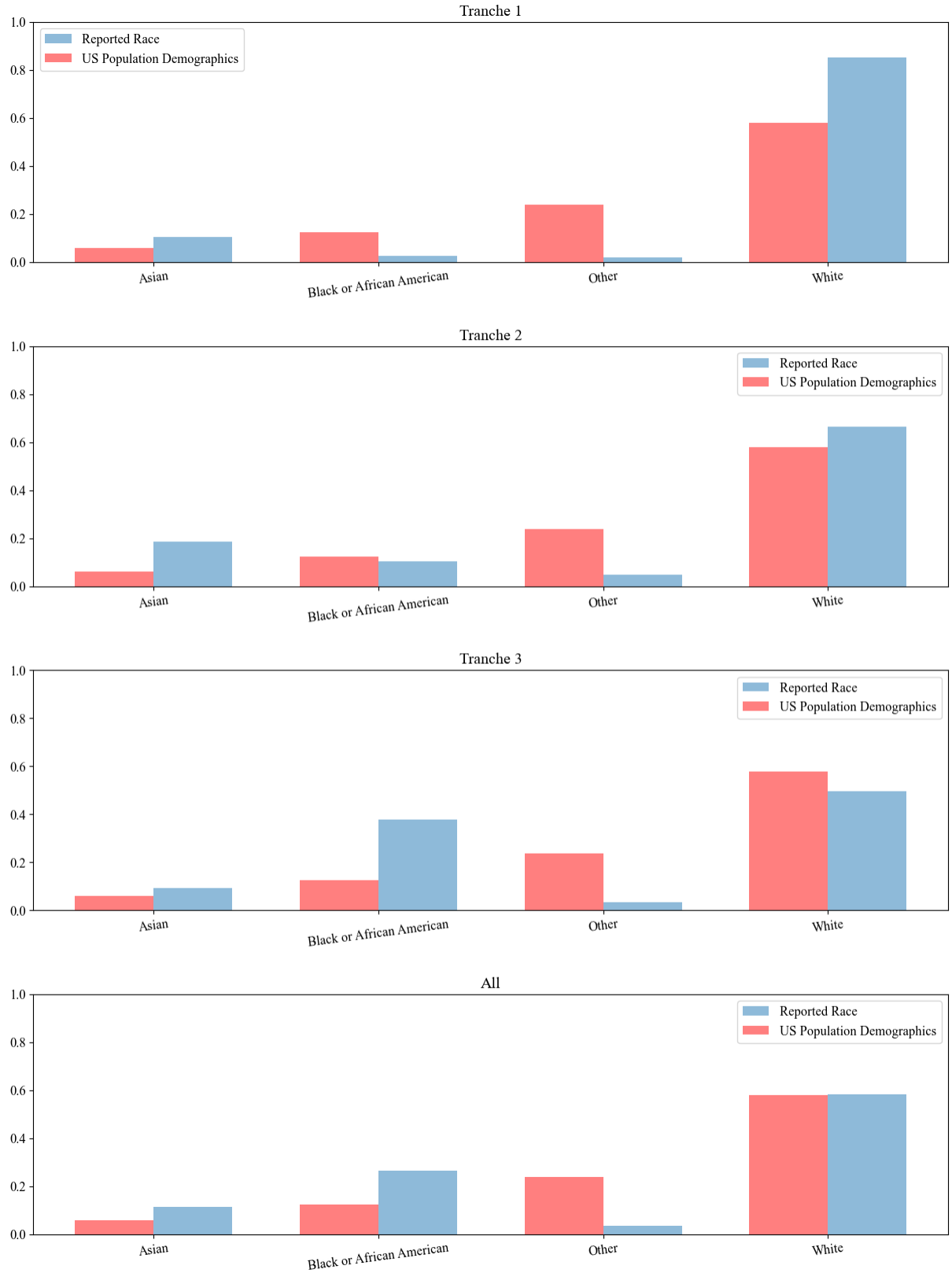

Figure A1. Percent of Reported Races Against U.S. Population Demographics

APPENDIX B

Table B1. Effects of Demographics on Number of Loans Received - Tobit

Loans per Employer Establishment	Tranche 1	Tranche 2	Trance 3	All
White Share	0.000551***	-0.002576***	-0.012440***	-0.015022***
	(0.000174)	(0.000280)	(0.001138)	(0.001293)
White Share^2	0.000006***	0.000009***	0.000083***	0.000103***
	(0.000002)	(0.000003)	(0.000011)	(0.000012)
White Share x Rural Ind.	0.001145***	0.000813**	0.006795***	0.008338***
	(0.000214)	(0.000323)	(0.000993)	(0.001184)
White Share^2 x Rural Ind.	-0.000017***	0.000004	-0.000040***	-0.000051***
	(0.000002)	(0.000003)	(0.000010)	(0.000012)
Black Share	0.001434***	-0.000127	0.001993	0.003350
	(0.000160)	(0.000304)	(0.002340)	(0.002533)
Black Share^2	-0.000012***	0.000018***	0.000328***	0.000332***
	(0.000002)	(0.000005)	(0.000046)	(0.000049)
Black Share x Rural Ind.	-0.000359	0.002473***	0.000533	0.002072
	(0.000270)	(0.000430)	(0.002717)	(0.002979)
Black Share^2 x Rural Ind.	0.000005	-0.000037***	-0.000204***	-0.000230***
	(0.000004)	(0.000007)	(0.000056)	(0.000060)
Rural	-0.000609***	-0.002383***	-0.003537***	-0.006145***
	(0.000054)	(0.000084)	(0.000211)	(0.000266)
Midwest	0.049925***	-0.011256***	0.216732***	0.239600***
	(0.001990)	(0.002967)	(0.008661)	(0.009994)
Northeast	0.058950***	0.032156***	0.011905*	0.096126***
	(0.002278)	(0.003445)	(0.006665)	(0.008776)
South	0.023274***	-0.019512***	0.025918***	0.025499***
	(0.001866)	(0.003008)	(0.007480)	(0.009082)
% ≥ Bachelor's	0.001256***	0.001740***	0.000748***	0.003490***
	(0.000089)	(0.000139)	(0.000219)	(0.000302)
Per Capita Income	-0.000001***	0.000002***	0.000001***	0.000003***
	(0.000000)	(0.000000)	(0.000000)	(0.000000)
Gini Coefficient	0.001123***	-0.000507***	0.000603	0.000003
	(0.000130)	(0.000179)	(0.000392)	(0.000488)
Unemployment Rate	-0.001011***	0.000553	-0.002590***	-0.002012**
	(0.000208)	(0.000339)	(0.000638)	(0.000796)
Constant	0.009572	0.372494***	0.714967***	1.166670***
	(0.006385)	(0.009834)	(0.029793)	(0.035406)
N	31,314	31,314	31,314	31,314
Mean Outcome	0.13	0.234	0.462	0.825
Log Likelihood	21280	12036	-18995	-24580

Note: Table displays coefficient estimates from Tobit regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B2. Effects of Demographics on Mean Loan Amount per Employee - Tobit

Mean Loan Amount per Employee	Tranche 1	Tranche 2	Trance 3	All
White Share	11.252**	-22.861***	-33.816***	-59.579***
	(4.888)	(4.717)	(6.897)	(11.263)
White Share^2	-0.009	0.106***	0.212***	0.430***
	(0.048)	(0.039)	(0.057)	(0.098)
White Share x Rural Ind.	3.900	16.810**	15.240*	30.815*
	(8.893)	(6.686)	(8.190)	(15.826)
White Share^2 x Rural Ind.	0.027	-0.131**	-0.071	-0.188
	(0.098)	(0.065)	(0.085)	(0.163)
Black Share	-11.028**	-10.831**	-22.353***	-39.988***
	(5.323)	(4.682)	(7.400)	(12.197)
Black Share^2	0.239***	0.167*	0.820***	1.133***
	(0.064)	(0.093)	(0.130)	(0.208)
Black Share x Rural Ind.	17.240	-1.717	-25.912	-28.783
	(11.843)	(8.661)	(16.189)	(24.422)
Black Share^2 x Rural Ind.	-0.228	-0.050	1.064***	1.016**
	(0.170)	(0.142)	(0.326)	(0.440)
Rural	-2.803*	1.651	9.174***	18.069***
	(1.702)	(1.701)	(2.545)	(4.019)
Midwest	1,104.531***	-804.537***	224.571*	151.894
	(108.883)	(70.944)	(133.303)	(219.329)
Northeast	849.478***	-319.366***	205.165	504.521**
	(103.021)	(77.986)	(128.669)	(224.724)
South	521.006***	-627.064***	113.926	-189.756
	(101.305)	(71.397)	(103.698)	(187.120)
% ≥ Bachelor's	14.876***	4.660*	4.926	18.757***
	(3.245)	(2.783)	(4.061)	(7.209)
Per Capita Income	-0.001	0.025***	0.024***	0.053***
	(0.004)	(0.004)	(0.005)	(0.009)
Gini Coefficient	17.692***	-15.401***	-10.201*	-34.509***
	(6.532)	(4.294)	(5.922)	(10.868)
Unemployment Rate	-47.475***	4.774	-13.979	-30.852*
	(11.019)	(6.856)	(9.628)	(17.032)
Constant	361.636	2,767.972***	2,660.773***	7,390.060***
	(267.860)	(219.214)	(291.628)	(507.273)
N	29,787	29,787	29,787	29,787
Mean Outcome	3,043.116	1,881.202	3,122.368	8,046.69
Log Likelihood	-276382	-272012	-289974	-312137

Note: Table displays coefficient estimates from Tobit regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B3. 1st Stage of Cragg-Hurdle Regression for Number of Loans Received

Loans per Employer Establishment	Tranche 1	Tranche 2	Trance 3	All
White Share	0.017173***	0.020506***	0.034241***	0.023424**
	(0.004334)	(0.005206)	(0.007402)	(0.009531)
White Share^2	-0.000170***	-0.000217***	-0.000359***	-0.000240**
	(0.000048)	(0.000058)	(0.000081)	(0.000106)
White Share x Rural Ind.	0.009049**	0.003531	-0.002107	0.006393
	(0.004589)	(0.005554)	(0.007835)	(0.010257)
White Share^2 x Rural Ind.	-0.000026	0.000036	0.000116	0.000020
	(0.000050)	(0.000061)	(0.000085)	(0.000113)
Black Share	-0.001357	-0.000612	-0.036534*	-0.064758***
	(0.005696)	(0.006785)	(0.019830)	(0.022273)
Black Share^2	0.000046	0.000058	0.001428**	0.002022***
	(0.000091)	(0.000107)	(0.000610)	(0.000701)
Black Share x Rural Ind.	0.020492***	0.023435***	0.038503*	0.065907***
	(0.006512)	(0.007800)	(0.020336)	(0.023323)
Black Share^2 x Rural Ind.	-0.000281***	-0.000301**	-0.001268**	-0.001829**
	(0.000103)	(0.000121)	(0.000615)	(0.000712)
Rural	-0.016168***	-0.013244***	-0.013091***	-0.014770***
	(0.000835)	(0.000975)	(0.001243)	(0.001953)
Midwest	0.665227***	0.448115***	0.624271***	0.510430***
	(0.037975)	(0.047441)	(0.057703)	(0.076287)
Northeast	0.369578***	0.161801***	0.071199	0.064201
	(0.042015)	(0.051018)	(0.057481)	(0.077306)
South	0.259169***	-0.006751	0.208411***	0.212175***
	(0.036309)	(0.044421)	(0.052977)	(0.069762)
% ≥ Bachelor's	0.015205***	0.012456***	0.009000***	0.009582**
	(0.001631)	(0.002111)	(0.002526)	(0.003895)
Per Capita Income	-0.000001	0.000005	0.000007*	0.000010
	(0.000002)	(0.000003)	(0.000004)	(0.000006)
Gini Coefficient	0.032913***	0.031601***	0.038361***	0.031190***
	(0.001741)	(0.002031)	(0.002370)	(0.003162)
Unemployment Rate	-0.016486***	-0.010318***	-0.015014***	-0.014462***
	(0.002018)	(0.002304)	(0.002556)	(0.002999)
Constant	0.065705	0.341881***	0.127099	0.942891***
	(0.106834)	(0.130558)	(0.161293)	(0.238522)
N	31,314	31,314	31,314	31,314
Log Likelihood	51601	44703	27512	13548

Note: Table displays coefficient estimates from the first stage of a Cragg-hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B4. 2nd Stage of Cragg-Hurdle Regression for Number of Loans Received

Loans per Employer Establishment	Tranche 1	Tranche 2	Trance 3	All
White Share	0.007758***	-0.008061***	-0.009365***	-0.005128***
	(0.001111)	(0.000916)	(0.001128)	(0.001020)
White Share^2	0.000010	0.000038***	0.000035***	0.000023***
	(0.000010)	(0.000008)	(0.000010)	(0.000009)
White Share x Rural Ind.	0.005535***	0.002585**	0.002865**	0.005480***
	(0.001390)	(0.001243)	(0.001348)	(0.001230)
White Share^2 x Rural Ind.	-0.000095***	0.000009	0.000029**	-0.000009
	(0.000014)	(0.000012)	(0.000013)	(0.000012)
Black Share	0.011284***	0.006428***	0.021128***	0.013312***
	(0.001059)	(0.000824)	(0.001066)	(0.000896)
Black Share^2	-0.000084***	-0.000029***	-0.000036**	0.000010
	(0.000014)	(0.000011)	(0.000015)	(0.000013)
Black Share x Rural Ind.	-0.004854**	0.010519***	-0.004938***	0.001108
	(0.001910)	(0.001574)	(0.001772)	(0.001558)
Black Share^2 x Rural Ind.	0.000084***	-0.000104***	0.000068**	0.000001
	(0.000030)	(0.000024)	(0.000028)	(0.000025)
Rural	-0.004010***	-0.009916***	-0.006528***	-0.008443***
	(0.000310)	(0.000313)	(0.000362)	(0.000342)
Midwest	0.332157***	-0.041365***	0.542321***	0.385888***
	(0.014118)	(0.012313)	(0.012665)	(0.011036)
Northeast	0.414480***	0.133328***	0.127313***	0.193341***
	(0.014631)	(0.012333)	(0.012423)	(0.011052)
South	0.147836***	-0.149098***	0.113416***	0.051242***
	(0.014029)	(0.012577)	(0.012835)	(0.011473)
% ≥ Bachelor's	0.008297***	0.006541***	0.002134***	0.004735***
	(0.000482)	(0.000518)	(0.000401)	(0.000377)
Per Capita Income	-0.000004***	0.000008***	0.000003***	0.000003***
	(0.000001)	(0.000001)	(0.000000)	(0.000000)
Gini Coefficient	-0.000194	-0.005771***	0.000125	0.001745***
	(0.000749)	(0.000681)	(0.000646)	(0.000591)
Unemployment Rate	-0.001034	0.004914***	-0.004537***	-0.003626***
	(0.001289)	(0.001087)	(0.001075)	(0.000999)
Constant	-2.803946***	-1.028383***	-0.871642***	-0.364657***
	(0.041078)	(0.035368)	(0.039003)	(0.034894)
N	31,314	31,314	31,314	31,314
Log Likelihood	51601	44703	27512	13548

Note: Table displays coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B5. Partial Derivatives of 2nd Stage of Cragg-Hurdle Regression for Number of Loans Received

Loans per Employer Establishment	Tranche 1	Tranche 2	Trance 3	All
White Share	0.001334***	-0.001688***	-0.003830***	-0.004079***
	(0.000167)	(0.000242)	(0.000555)	(0.000892)
White Share^2	-0.000001	0.000006***	0.000010**	0.000017**
	(0.000002)	(0.000002)	(0.000005)	(0.000008)
White Share x Rural Ind.	0.000900***	0.000699**	0.001328**	0.004839***
	(0.000204)	(0.000321)	(0.000660)	(0.001080)
White Share^2 x Rural Ind.	-0.000013***	0.000003	0.000016**	-0.000008
	(0.000002)	(0.000003)	(0.000006)	(0.000010)
Black Share	0.001518***	0.001592***	0.009401***	0.010530***
	(0.000172)	(0.000233)	(0.000636)	(0.000855)
Black Share^2	-0.000011***	-0.000006**	0.000010	0.000040**
	(0.000002)	(0.000003)	(0.000014)	(0.000016)
Black Share x Rural Ind.	-0.000335	0.002986***	-0.001637*	0.001965
	(0.000281)	(0.000411)	(0.000929)	(0.001396)
Black Share^2 x Rural Ind.	0.000007	-0.000031***	0.000009	-0.000027
	(0.000004)	(0.000006)	(0.000017)	(0.000024)
Rural	-0.000806***	-0.002677***	-0.003361***	-0.007531***
	(0.000044)	(0.000080)	(0.000177)	(0.000307)
Midwest	0.055974***	-0.003315	0.270538***	0.341686***
	(0.002024)	(0.003135)	(0.006379)	(0.009900)
Northeast	0.062478***	0.035733***	0.062101***	0.168272***
	(0.002162)	(0.003176)	(0.006026)	(0.009725)
South	0.024322***	-0.037243***	0.058035***	0.047576***
	(0.002002)	(0.003187)	(0.006215)	(0.009986)
% ≥ Bachelor's	0.001376***	0.001823***	0.001187***	0.004243***
	(0.000071)	(0.000132)	(0.000196)	(0.000330)
Per Capita Income	-0.000001***	0.000002***	0.000001***	0.000003***
	(0.000000)	(0.000000)	(0.000000)	(0.000000)
Gini Coefficient	0.000500***	-0.000945***	0.000778**	0.001986***
	(0.000107)	(0.000173)	(0.000309)	(0.000512)
Unemployment Rate	-0.000405**	0.001063***	-0.002447***	-0.003358***
	(0.000184)	(0.000275)	(0.000518)	(0.000869)
N	31,314	31,314	31,314	31,314
Mean Outcome	0.13	0.234	0.462	0.825
Log Likelihood	51601	44703	27512	13548

Note: Table displays derivatives of coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. Actual coefficient estimates are not directly interpretable, and the partial derivatives must be used instead.

Table B6. 1st Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee

Mean Loan Amount per Employee	Tranche 1	Tranche 2	Trance 3	All
White Share	0.018***	0.020***	0.041***	0.027***
	(0.004)	(0.005)	(0.008)	(0.010)
White Share^2	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
White Share x Rural Ind.	0.005	-0.001	-0.017**	0.000
	(0.005)	(0.006)	(0.008)	(0.011)
White Share^2 x Rural Ind.	0.000	0.000	0.000***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share	-0.009	-0.009	-0.055***	-0.080***
	(0.006)	(0.007)	(0.020)	(0.022)
Black Share^2	0.000	0.000	0.002***	0.002***
	(0.000)	(0.000)	(0.001)	(0.001)
Black Share x Rural Ind.	0.020***	0.027***	0.062***	0.080***
	(0.007)	(0.009)	(0.021)	(0.024)
Black Share^2 x Rural Ind.	-0.000**	-0.000**	-0.002***	-0.002***
	(0.000)	(0.000)	(0.001)	(0.001)
Rural	-0.015***	-0.011***	-0.012***	-0.013***
	(0.001)	(0.001)	(0.001)	(0.002)
Midwest	0.642***	0.332***	0.611***	0.597***
	(0.041)	(0.052)	(0.062)	(0.094)
Northeast	0.390***	0.175***	0.174***	0.203**
	(0.045)	(0.056)	(0.062)	(0.092)
South	0.374***	0.110**	0.264***	0.373***
	(0.040)	(0.051)	(0.058)	(0.091)
% ≥ Bachelor's	0.014***	0.009***	0.008***	0.006
	(0.002)	(0.002)	(0.003)	(0.005)
Per Capita Income	-0.000	0.000*	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Gini Coefficient	0.029***	0.027***	0.040***	0.033***
	(0.002)	(0.002)	(0.003)	(0.004)
Unemployment Rate	-0.014***	-0.009***	-0.013***	-0.015***
	(0.002)	(0.003)	(0.003)	(0.004)
Constant	0.241**	0.563***	0.121	0.913***
	(0.117)	(0.151)	(0.175)	(0.277)
N	29,787	29,787	29,787	29,787
Log Likelihood	-230683	-221848	-237120	-266886

Note: Table displays coefficient estimates from the first stage of a Cragg-hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B7. 2nd Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee

Mean Loan Amount per Employee	Tranche 1	Tranche 2	Trance 3	All
White Share	0.004**	-0.012***	-0.009***	-0.005***
	(0.002)	(0.001)	(0.001)	(0.001)
White Share^2	0.000	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
White Share x Rural Ind.	0.004*	0.004**	0.003*	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
White Share^2 x Rural Ind.	-0.000**	0.000	0.000	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share	-0.001	-0.005***	-0.002	-0.004***
	(0.002)	(0.002)	(0.001)	(0.001)
Black Share^2	0.000	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share x Rural Ind.	-0.006**	0.004	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.002)
Black Share^2 x Rural Ind.	0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Rural	0.000	-0.003***	0.000	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
Midwest	0.362***	-0.442***	0.104***	0.109***
	(0.021)	(0.021)	(0.020)	(0.018)
Northeast	0.251***	-0.201***	0.102***	0.089***
	(0.022)	(0.021)	(0.020)	(0.018)
South	0.195***	-0.305***	0.035*	-0.002
	(0.021)	(0.020)	(0.020)	(0.018)
% ≥ Bachelor's	0.004***	0.002*	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Per Capita Income	0.000**	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Gini Coefficient	0.001	-0.004***	-0.000	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Unemployment Rate	-0.008***	0.004*	-0.001	-0.005***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	6.977***	7.582***	7.407***	8.305***
	(0.059)	(0.059)	(0.057)	(0.050)
N	29,787	29,787	29,787	29,787
Log Likelihood	-230683	-221848	-237120	-266886

Note: Table displays coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B8. Partial Derivatives of 2nd Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee

Mean Loan Amount per Employee	Tranche 1	Tranche 2	Trance 3	All
White Share	19.816***	-21.081***	-23.259***	-41.427***
	(5.255)	(3.251)	(4.670)	(10.678)
White Share^2	-0.048	0.072**	0.114**	0.316***
	(0.051)	(0.030)	(0.044)	(0.100)
White Share x Rural Ind.	14.555**	8.227*	7.751	51.274***
	(6.838)	(4.262)	(6.214)	(14.381)
White Share^2 x Rural Ind.	-0.137**	0.014	0.058	-0.272*
	(0.070)	(0.043)	(0.063)	(0.144)
Black Share	-5.999	-12.081***	-14.278***	-45.510***
	(5.648)	(3.242)	(5.377)	(10.699)
Black Share^2	0.159*	0.141***	0.716***	1.291***
	(0.083)	(0.044)	(0.116)	(0.165)
Black Share x Rural Ind.	-12.305	11.695**	12.148	16.886
	(9.808)	(5.887)	(9.093)	(19.793)
Black Share^2 x Rural Ind.	0.083	-0.182*	-0.047	0.010
	(0.158)	(0.093)	(0.168)	(0.327)
Rural	-5.884***	-6.759***	-1.740	-9.589***
	(1.457)	(0.951)	(1.386)	(3.326)
Midwest	1,440.469***	-859.983***	422.682***	1,002.088***
	(70.783)	(47.180)	(64.318)	(149.951)
Northeast	976.191***	-388.457***	352.201***	781.279***
	(72.867)	(45.770)	(65.018)	(153.037)
South	788.088***	-610.689***	151.535**	31.616
	(68.829)	(43.542)	(62.910)	(148.951)
% ≥ Bachelor's	19.542***	5.354***	9.694***	28.878***
	(2.463)	(2.061)	(2.611)	(6.231)
Per Capita Income	0.006**	0.030***	0.028***	0.059***
	(0.003)	(0.004)	(0.003)	(0.008)
Gini Coefficient	16.461***	-4.533*	4.388	31.541***
	(3.646)	(2.578)	(3.547)	(8.455)
Unemployment Rate	-31.681***	6.743	-4.843	-43.668***
	(6.717)	(4.197)	(5.864)	(14.379)
N	29,787	29,787	29,787	29,787
Mean Outcome	3,043.116	1,881.202	3,122.368	8,046.69
Log Likelihood	-230683	-221848	-237120	-266886

Note: Table displays derivatives of coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. Actual coefficient estimates are not directly interpretable, and the partial derivatives must be used instead.

Table B9. 1st Stage of Cragg-Hurdle Regression for Number of Loans Received – Traditional Lenders Only

Loans per Employer Establishment	Tranche 1	Tranche 2	Trance 3	All
White Share	0.016217***	0.019464***	0.027760***	0.021789**
	(0.004274)	(0.004894)	(0.006521)	(0.008978)
White Share^2	-0.000160***	-0.000207***	-0.000290***	-0.000219**
	(0.000047)	(0.000054)	(0.000071)	(0.000099)
White Share x Rural Ind.	0.008695*	0.004144	0.002609	0.009680
	(0.004525)	(0.005237)	(0.006902)	(0.009523)
White Share^2 x Rural Ind.	-0.000022	0.000034	0.000072	-0.000013
	(0.000050)	(0.000058)	(0.000075)	(0.000104)
Black Share	-0.002885	-0.002315	-0.040938**	-0.057943***
	(0.005667)	(0.006245)	(0.017863)	(0.021624)
Black Share^2	0.000065	0.000071	0.001683***	0.001921***
	(0.000091)	(0.000097)	(0.000589)	(0.000697)
Black Share x Rural Ind.	0.022608***	0.023838***	0.045737**	0.058430***
	(0.006459)	(0.007269)	(0.018234)	(0.022149)
Black Share^2 x Rural Ind.	-0.000305***	-0.000305***	-0.001645***	-0.001847***
	(0.000103)	(0.000111)	(0.000591)	(0.000699)
Rural	-0.016227***	-0.013750***	-0.014250***	-0.014980***
	(0.000824)	(0.000939)	(0.001152)	(0.001790)
Midwest	0.680510***	0.479695***	0.676504***	0.607028***
	(0.037485)	(0.046199)	(0.054725)	(0.071449)
Northeast	0.371026***	0.128221***	0.052681	0.085613
	(0.041486)	(0.049031)	(0.054242)	(0.070353)
South	0.269893***	-0.000744	0.208385***	0.242983***
	(0.035832)	(0.042988)	(0.048941)	(0.064642)
% ≥ Bachelor's	0.015371***	0.012765***	0.010166***	0.011081***
	(0.001603)	(0.001997)	(0.002342)	(0.003513)
Per Capita Income	-0.000001	0.000003	0.000006*	0.000005
	(0.000002)	(0.000003)	(0.000003)	(0.000005)
Gini Coefficient	0.033027***	0.032595***	0.038337***	0.031970***
	(0.001722)	(0.001976)	(0.002236)	(0.002887)
Unemployment Rate	-0.016609***	-0.010354***	-0.014800***	-0.013404***
	(0.002010)	(0.002272)	(0.002481)	(0.002900)
Constant	0.051333	0.325074***	0.126605	0.854790***
	(0.105773)	(0.124454)	(0.147097)	(0.210707)
N	31,314	31,314	31,314	31,314
Log Likelihood	51636	47682	33367	18038

Note: Table displays coefficient estimates from the first stage of a Cragg-hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B10. 2nd Stage of Cragg-Hurdle Regression for Number of Loans Received – Traditional Lenders Only

Loans per Employer Establishment	Tranche 1	Tranche 2	Trance 3	All
White Share	0.007793***	-0.006060***	-0.005933***	-0.001683*
	(0.001172)	(0.000868)	(0.001023)	(0.000948)
White Share^2	0.000018*	0.000033***	0.000028***	0.000011
	(0.000011)	(0.000008)	(0.000009)	(0.000008)
White Share x Rural Ind.	0.006640***	0.001485	0.000660	0.003506***
	(0.001434)	(0.001210)	(0.001303)	(0.001201)
White Share^2 x Rural Ind.	-0.000112***	0.000012	0.000033***	-0.000002
	(0.000014)	(0.000012)	(0.000013)	(0.000011)
Black Share	0.012096***	0.004450***	0.005905***	0.004320***
	(0.001126)	(0.000749)	(0.000931)	(0.000779)
Black Share^2	-0.000090***	-0.000031***	0.000059***	0.000043***
	(0.000015)	(0.000009)	(0.000013)	(0.000011)
Black Share x Rural Ind.	-0.007303***	0.010438***	-0.002985*	0.002569*
	(0.001960)	(0.001551)	(0.001650)	(0.001457)
Black Share^2 x Rural Ind.	0.000113***	-0.000080***	0.000057**	-0.000003
	(0.000030)	(0.000024)	(0.000025)	(0.000023)
Rural	-0.003417***	-0.008737***	-0.003816***	-0.006579***
	(0.000319)	(0.000304)	(0.000345)	(0.000334)
Midwest	0.384394***	-0.003820	0.626393***	0.449541***
	(0.014565)	(0.012173)	(0.012734)	(0.011088)
Northeast	0.455867***	0.118897***	0.169478***	0.216803***
	(0.015212)	(0.012201)	(0.012392)	(0.011105)
South	0.192933***	-0.139606***	0.166052***	0.089626***
	(0.014531)	(0.012362)	(0.012762)	(0.011435)
% ≥ Bachelor's	0.008199***	0.006110***	0.003279***	0.005279***
	(0.000505)	(0.000496)	(0.000394)	(0.000371)
Per Capita Income	-0.000004***	0.000007***	0.000002***	0.000002***
	(0.000001)	(0.000001)	(0.000000)	(0.000000)
Gini Coefficient	-0.000041	-0.005623***	0.001105*	0.002580***
	(0.000765)	(0.000668)	(0.000643)	(0.000587)
Unemployment Rate	-0.001453	0.004878***	-0.005861***	-0.004198***
	(0.001317)	(0.001108)	(0.001092)	(0.000992)
Constant	-2.935407***	-1.275588***	-1.379295***	-0.759483***
	(0.042601)	(0.034460)	(0.037112)	(0.033517)
N	31,314	31,314	31,314	31,314
Log Likelihood	51636	47682	33367	18038

Note: Table displays coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B11. Partial Derivatives of 2nd Stage of Cragg-Hurdle Regression for Number of Loans Received – Traditional Lenders Only

Loans per Employer Establishment	Tranche 1	Tranche 2	Trance 3	All
White Share	0.001290***	-0.001005***	-0.001624***	-0.000840
	(0.000170)	(0.000201)	(0.000390)	(0.000691)
White Share^2	-0.000000	0.000004**	0.000005	0.000005
	(0.000002)	(0.000002)	(0.000003)	(0.000006)
White Share x Rural Ind.	0.001016***	0.000383	0.000289	0.002658***
	(0.000204)	(0.000272)	(0.000489)	(0.000872)
White Share^2 x Rural Ind.	-0.000015***	0.000003	0.000013***	-0.000002
	(0.000002)	(0.000003)	(0.000005)	(0.000008)
Black Share	0.001548***	0.000921***	0.001364***	0.002124***
	(0.000175)	(0.000188)	(0.000480)	(0.000665)
Black Share^2	-0.000011***	-0.000006**	0.000053***	0.000062***
	(0.000002)	(0.000002)	(0.000012)	(0.000014)
Black Share x Rural Ind.	-0.000597**	0.002609***	-0.000214	0.002794**
	(0.000280)	(0.000352)	(0.000692)	(0.001102)
Black Share^2 x Rural Ind.	0.000010**	-0.000022***	-0.000011	-0.000033
	(0.000004)	(0.000005)	(0.000014)	(0.000020)
Rural	-0.000713***	-0.002089***	-0.001654***	-0.004935***
	(0.000044)	(0.000067)	(0.000127)	(0.000245)
Midwest	0.061712***	0.006528**	0.239942***	0.330354***
	(0.002021)	(0.002693)	(0.004944)	(0.008265)
Northeast	0.066126***	0.027523***	0.062446***	0.155909***
	(0.002172)	(0.002729)	(0.004615)	(0.008087)
South	0.029814***	-0.030021***	0.064158***	0.067872***
	(0.002007)	(0.002720)	(0.004744)	(0.008232)
% ≥ Bachelor's	0.001330***	0.001509***	0.001382***	0.003945***
	(0.000072)	(0.000110)	(0.000149)	(0.000269)
Per Capita Income	-0.000001***	0.000002***	0.000001***	0.000002***
	(0.000000)	(0.000000)	(0.000000)	(0.000000)
Gini Coefficient	0.000529***	-0.000709***	0.001128***	0.002365***
	(0.000106)	(0.000147)	(0.000235)	(0.000419)
Unemployment Rate	-0.000461**	0.000890***	-0.002406***	-0.003213***
	(0.000182)	(0.000243)	(0.000403)	(0.000712)
N	31,314	31,314	31,314	31,314
Mean Outcome	0.126	0.203	0.35	0.678
Log Likelihood	51636	47682	33367	18038

Note: Table displays derivatives of coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. Actual coefficient estimates are not directly interpretable, and the partial derivatives must be used instead.

Table B12. 1st Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee – Traditional Lenders Only

Mean Loan Amount per Employee	Tranche 1	Tranche 2	Trance 3	All
White Share	0.017***	0.019***	0.032***	0.024**
	(0.004)	(0.005)	(0.007)	(0.009)
White Share^2	-0.000***	-0.000***	-0.000***	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
White Share x Rural Ind.	0.005	-0.001	-0.012*	0.004
	(0.005)	(0.005)	(0.007)	(0.010)
White Share^2 x Rural Ind.	0.000	0.000	0.000***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share	-0.010*	-0.011*	-0.055***	-0.069***
	(0.006)	(0.007)	(0.018)	(0.022)
Black Share^2	0.000	0.000*	0.002***	0.002***
	(0.000)	(0.000)	(0.001)	(0.001)
Black Share x Rural Ind.	0.022***	0.026***	0.063***	0.064***
	(0.007)	(0.008)	(0.019)	(0.022)
Black Share^2 x Rural Ind.	-0.000**	-0.000***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.001)	(0.001)
Rural	-0.015***	-0.012***	-0.013***	-0.013***
	(0.001)	(0.001)	(0.001)	(0.002)
Midwest	0.659***	0.361***	0.660***	0.678***
	(0.040)	(0.050)	(0.058)	(0.088)
Northeast	0.390***	0.139***	0.150***	0.168**
	(0.044)	(0.053)	(0.058)	(0.082)
South	0.388***	0.124**	0.264***	0.350***
	(0.039)	(0.049)	(0.053)	(0.081)
% ≥ Bachelor's	0.014***	0.010***	0.009***	0.007*
	(0.002)	(0.002)	(0.003)	(0.004)
Per Capita Income	-0.000	0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Gini Coefficient	0.030***	0.028***	0.039***	0.033***
	(0.002)	(0.002)	(0.003)	(0.004)
Unemployment Rate	-0.015***	-0.009***	-0.013***	-0.016***
	(0.002)	(0.003)	(0.003)	(0.004)
Constant	0.217*	0.572***	0.138	0.907***
	(0.116)	(0.143)	(0.161)	(0.245)
N	29,787	29,787	29,787	29,787
Log Likelihood	-229637	-218700	-232716	-264604

Note: Table displays coefficient estimates from the first stage of a Cragg-hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B13. 2nd Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee – Traditional Lenders Only

Mean Loan Amount per Employee	Tranche 1	Tranche 2	Trance 3	All
White Share	0.004***	-0.011***	-0.007***	-0.004***
	(0.002)	(0.001)	(0.001)	(0.001)
White Share^2	0.000	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
White Share x Rural Ind.	0.004**	0.004*	0.003	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
White Share^2 x Rural Ind.	-0.000***	-0.000	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share	-0.000	-0.005***	-0.008***	-0.006***
	(0.002)	(0.002)	(0.001)	(0.001)
Black Share^2	0.000	0.000**	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share x Rural Ind.	-0.008***	0.003	-0.004	-0.001
	(0.003)	(0.003)	(0.003)	(0.002)
Black Share^2 x Rural Ind.	0.000*	-0.000	0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Rural	0.001	-0.002***	0.001**	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Midwest	0.394***	-0.415***	0.164***	0.150***
	(0.022)	(0.021)	(0.020)	(0.018)
Northeast	0.274***	-0.210***	0.135***	0.101***
	(0.022)	(0.021)	(0.021)	(0.018)
South	0.226***	-0.307***	0.066***	0.015
	(0.021)	(0.020)	(0.020)	(0.018)
% ≥ Bachelor's	0.004***	0.002*	0.003***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Per Capita Income	0.000*	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Gini Coefficient	0.001	-0.004***	0.001	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Unemployment Rate	-0.008***	0.004*	-0.001	-0.005***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	6.902***	7.427***	7.099***	8.086***
	(0.061)	(0.059)	(0.058)	(0.051)
N	29,787	29,787	29,787	29,787
Log Likelihood	-229637	-218700	-232716	-264604

Note: Table displays coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B14. Partial Derivatives of 2nd Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee – Traditional Lenders Only

Mean Loan Amount per Employee	Tranche 1	Tranche 2	Trance 3	All
White Share	20.283***	-17.310***	-15.161***	-28.862***
	(5.268)	(2.856)	(4.105)	(10.028)
White Share^2	-0.040	0.064**	0.090**	0.286***
	(0.051)	(0.027)	(0.039)	(0.094)
White Share x Rural Ind.	16.302**	6.765*	6.941	43.955***
	(6.808)	(3.870)	(5.544)	(13.683)
White Share^2 x Rural Ind.	-0.169**	0.010	0.031	-0.255*
	(0.070)	(0.039)	(0.057)	(0.138)
Black Share	-4.599	-11.854***	-32.046***	-57.823***
	(5.774)	(2.932)	(4.830)	(10.301)
Black Share^2	0.148*	0.104***	0.721***	1.098***
	(0.085)	(0.040)	(0.113)	(0.168)
Black Share x Rural Ind.	-17.090*	8.493	-2.169	5.381
	(9.774)	(5.491)	(8.137)	(18.985)
Black Share^2 x Rural Ind.	0.135	-0.139	-0.030	-0.138
	(0.157)	(0.089)	(0.156)	(0.321)
Rural	-4.532***	-5.246***	0.457	-4.661
	(1.435)	(0.846)	(1.231)	(3.115)
Midwest	1,536.493***	-717.345***	564.683***	1,284.495***
	(71.706)	(41.603)	(57.851)	(142.398)
Northeast	1,037.533***	-369.440***	402.247***	820.353***
	(73.833)	(41.092)	(58.546)	(145.422)
South	884.215***	-551.336***	227.456***	174.118
	(69.692)	(39.168)	(56.883)	(142.258)
% ≥ Bachelor's	19.582***	4.853***	11.287***	29.929***
	(2.447)	(1.850)	(2.293)	(5.779)
Per Capita Income	0.004	0.026***	0.023***	0.050***
	(0.003)	(0.003)	(0.003)	(0.007)
Gini Coefficient	16.578***	-2.872	8.429***	39.733***
	(3.631)	(2.314)	(3.156)	(8.050)
Unemployment Rate	-31.961***	5.320	-5.332	-40.362***
	(6.672)	(3.841)	(5.259)	(13.760)
N	29,787	29,787	29,787	29,787
Mean Outcome	2,983.82	1,722.136	2,723.671	7,429.627
Log Likelihood	-229637	-218700	-232716	-264604

Note: Table displays derivatives of coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. Actual coefficient estimates are not directly interpretable, and the partial derivatives must be used instead.

Table B15. 1st and 2nd Stages of Cragg-Hurdle Regression for Number of Loans Received – Before and After Feb. 24th, 2021

Loans per Employer Establishment	Before Stage 1	Before Stage 2	After Stage 1	After Stage 2
White Share	0.026210***	-0.006132***	0.039440***	-0.012360***
	(0.004389)	(0.000943)	(0.005842)	(0.001172)
White Share^2	-0.000294***	0.000023***	-0.000413***	0.000046***
	(0.000048)	(0.000008)	(0.000063)	(0.000010)
White Share x Rural Ind.	0.004978	0.002106	-0.012603**	0.000603
	(0.004693)	(0.001339)	(0.006259)	(0.001386)
White Share^2 x Rural Ind.	0.000052	0.000005	0.000219***	0.000057***
	(0.000051)	(0.000013)	(0.000067)	(0.000013)
Black Share	-0.005205	0.002672***	-0.031004*	0.030491***
	(0.005592)	(0.000894)	(0.016506)	(0.001183)
Black Share^2	0.000096	0.000036***	0.001460***	-0.000113***
	(0.000081)	(0.000013)	(0.000535)	(0.000016)
Black Share x Rural Ind.	0.004940	-0.015247***	0.041384**	-0.003144*
	(0.006375)	(0.001820)	(0.016951)	(0.001873)
Black Share^2 x Rural Ind.	-0.000057	0.000191***	-0.001415***	0.000036
	(0.000094)	(0.000028)	(0.000538)	(0.000029)
Rural	-0.015592***	-0.004116***	-0.011131***	-0.006021***
	(0.000835)	(0.000326)	(0.001045)	(0.000364)
Midwest	0.839352***	0.604682***	0.642346***	0.439745***
	(0.042315)	(0.013812)	(0.048381)	(0.012991)
Northeast	0.189358***	0.210314***	0.023068	0.063676***
	(0.042376)	(0.013123)	(0.047956)	(0.013177)
South	0.177623***	0.028869**	0.185563***	0.147405***
	(0.038048)	(0.013553)	(0.044622)	(0.013205)
% ≥ Bachelor's	0.014506***	0.006860***	0.008014***	-0.001004**
	(0.001845)	(0.000426)	(0.001944)	(0.000410)
Per Capita Income	0.000004*	0.000003***	0.000001	0.000003***
	(0.000002)	(0.000000)	(0.000003)	(0.000000)
Gini Coefficient	0.036692***	-0.002895***	0.040656***	-0.003170***
	(0.001855)	(0.000704)	(0.002085)	(0.000673)
Unemployment Rate	-0.015143***	-0.006427***	-0.015226***	-0.001520
	(0.002098)	(0.001365)	(0.002341)	(0.001139)
Constant	-0.175492	-1.907814***	-0.173626	-1.053884***
	(0.113839)	(0.037599)	(0.132018)	(0.040729)
N	31,314	31,314	31,314	31,314
Log Likelihood	48368	48368	39052	39052

Note: Table displays coefficient estimates from the first and second stages of a Cragg-hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B16. Partial Derivatives of 2nd Stage of Cragg-Hurdle Regression for Number of Loans Received – Before and After Feb. 24th, 2021

Loans per Employer Establishment	Before	After
White Share	-0.000571***	-0.003046***
	(0.000174)	(0.000376)
White Share^2	-0.000001	0.000006*
	(0.000002)	(0.000003)
White Share x Rural Ind.	0.000437*	-0.000050
	(0.000237)	(0.000439)
White Share^2 x Rural Ind.	0.000002	0.000022***
	(0.000002)	(0.000004)
Black Share	0.000356**	0.008748***
	(0.000179)	(0.000482)
Black Share^2	0.000008***	-0.000007
	(0.000003)	(0.000011)
Black Share x Rural Ind.	-0.002457***	-0.000191
	(0.000324)	(0.000654)
Black Share^2 x Rural Ind.	0.000031***	-0.000015
	(0.000005)	(0.000013)
Rural	-0.000954***	-0.002049***
	(0.000055)	(0.000114)
Midwest	0.115230***	0.146447***
	(0.002521)	(0.004140)
Northeast	0.038314***	0.019904***
	(0.002307)	(0.004119)
South	0.007867***	0.048536***
	(0.002354)	(0.004126)
% ≥ Bachelor's	0.001393***	-0.000158
	(0.000078)	(0.000131)
Per Capita Income	0.000001***	0.000001***
	(0.000000)	(0.000000)
Gini Coefficient	0.000148	-0.000213
	(0.000122)	(0.000207)
Unemployment Rate	-0.001332***	-0.000748**
	(0.000237)	(0.000352)
N	31,314	31,314
Mean Outcome	0.159	0.303
Log Likelihood	48368	39052

Note: Table displays derivatives of coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. Actual coefficient estimates are not directly interpretable, and the partial derivatives must be used instead.

Table B17. 1st and 2nd Stages of Cragg-Hurdle Regression for Mean Loan Amount per Employee – Before and After Feb. 24th, 2021

Mean Loan Amount per Employee	Before Stage 1	Before Stage 2	After Stage 1	After Stage 2
White Share	0.026***	-0.005***	0.043***	-0.011***
	(0.004)	(0.001)	(0.006)	(0.002)
White Share^2	-0.000***	0.000***	-0.000***	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
White Share x Rural Ind.	-0.004	0.006***	-0.023***	-0.002
	(0.005)	(0.002)	(0.007)	(0.002)
White Share^2 x Rural Ind.	0.000***	-0.000**	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share	-0.012**	-0.007***	-0.049***	0.005***
	(0.006)	(0.001)	(0.017)	(0.002)
Black Share^2	0.000**	0.000***	0.002***	0.000***
	(0.000)	(0.000)	(0.001)	(0.000)
Black Share x Rural Ind.	0.013**	-0.010***	0.065***	0.006**
	(0.006)	(0.003)	(0.017)	(0.003)
Black Share^2 x Rural Ind.	-0.000	0.000**	-0.002***	0.000
	(0.000)	(0.000)	(0.001)	(0.000)
Rural	-0.015***	-0.001	-0.011***	0.001**
	(0.001)	(0.000)	(0.001)	(0.000)
Midwest	0.599***	0.029	0.660***	0.091***
	(0.041)	(0.023)	(0.051)	(0.021)
Northeast	0.314***	0.167***	0.123**	-0.016
	(0.044)	(0.022)	(0.050)	(0.022)
South	0.230***	-0.041*	0.251***	0.082***
	(0.040)	(0.022)	(0.047)	(0.021)
% ≥ Bachelor's	0.014***	0.005***	0.008***	-0.001
	(0.002)	(0.001)	(0.002)	(0.001)
Per Capita Income	0.000**	0.000***	-0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Gini Coefficient	0.033***	-0.003**	0.041***	-0.005***
	(0.002)	(0.001)	(0.002)	(0.001)
Unemployment Rate	-0.010***	0.002	-0.014***	0.001
	(0.002)	(0.002)	(0.003)	(0.002)
Constant	0.006	6.671***	-0.040	6.961***
	(0.120)	(0.065)	(0.143)	(0.061)
N	29,787	29,787	29,787	29,787
Log Likelihood	-209277	-209277	-213962	-213962

Note: Table displays coefficient estimates from the first stage and second of a Cragg-hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B18. Partial Derivatives of 2nd Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee – Before and After Feb. 24th, 2021

Mean Loan Amount per Employee	Before	After
White Share	-2.657	-11.587***
	(2.541)	(2.584)
White Share^2	0.013	-0.009
	(0.024)	(0.025)
White Share x Rural Ind.	8.267**	-5.789*
	(3.591)	(3.397)
White Share^2 x Rural Ind.	-0.047	0.164***
	(0.037)	(0.034)
Black Share	-13.443***	2.324
	(2.641)	(3.293)
Black Share^2	0.200***	0.400***
	(0.036)	(0.081)
Black Share x Rural Ind.	-13.756***	18.459***
	(5.248)	(5.087)
Black Share^2 x Rural Ind.	0.167**	-0.236**
	(0.082)	(0.103)
Rural	-4.302***	0.127
	(0.752)	(0.764)
Midwest	174.774***	228.334***
	(36.765)	(34.286)
Northeast	330.872***	-10.282
	(36.784)	(35.305)
South	-15.403	161.779***
	(35.906)	(33.331)
% ≥ Bachelor's	10.941***	-0.299
	(1.427)	(1.456)
Per Capita Income	0.015***	0.015***
	(0.002)	(0.002)
Gini Coefficient	2.447	-3.283*
	(2.076)	(1.900)
Unemployment Rate	0.765	-0.573
	(3.798)	(2.996)
N	29,787	29,787
Mean Outcome	1,499.87	1,622.50
Log Likelihood	-209277	-213962

Note: Table displays derivatives of coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. Actual coefficient estimates are not directly interpretable, and the partial derivatives must be used instead.

Table B19. 1st Stage of Cragg-Hurdle Regression for Number of Loans Received – First Four Periods

Loans per Employer Establishment	Period -3	Period -2	Period -1	Period 0
White Share	0.024035***	0.028955***	0.026977***	0.030588***
	(0.003374)	(0.003538)	(0.003480)	(0.003357)
White Share^2	-0.000288***	-0.000326***	-0.000303***	-0.000346***
	(0.000036)	(0.000038)	(0.000037)	(0.000036)
White Share x Rural Ind.	-0.003390	-0.002368	-0.006432*	-0.014178***
	(0.003592)	(0.003827)	(0.003727)	(0.003611)
White Share^2 x Rural Ind.	0.000114***	0.000108***	0.000147***	0.000223***
	(0.000039)	(0.000041)	(0.000040)	(0.000039)
Black Share	0.003145	-0.004396	0.003351	0.002446
	(0.004535)	(0.004676)	(0.004861)	(0.004833)
Black Share^2	-0.000010	0.000113*	0.000024	0.000031
	(0.000064)	(0.000068)	(0.000069)	(0.000071)
Black Share x Rural Ind.	-0.010812**	-0.000000	0.005295	0.007665
	(0.005148)	(0.005380)	(0.005497)	(0.005471)
Black Share^2 x Rural Ind.	0.000037	-0.000050	-0.000091	-0.000124
	(0.000076)	(0.000080)	(0.000080)	(0.000082)
Rural	-0.015766***	-0.014650***	-0.015603***	-0.013948***
	(0.000685)	(0.000725)	(0.000703)	(0.000688)
Midwest	1.050265***	0.906979***	0.715828***	0.776567***
	(0.032892)	(0.035533)	(0.033736)	(0.032479)
Northeast	0.324439***	0.152182***	-0.032039	-0.013462
	(0.034097)	(0.036058)	(0.034478)	(0.033238)
South	0.265463***	0.224175***	0.082513***	0.227315***
	(0.030236)	(0.032562)	(0.031660)	(0.030798)
% ≥ Bachelor's	0.014412***	0.015878***	0.013808***	0.011236***
	(0.001252)	(0.001419)	(0.001291)	(0.001210)
Per Capita Income	0.000001	0.000001	-0.000002	-0.000000
	(0.000002)	(0.000002)	(0.000002)	(0.000001)
Gini Coefficient	0.033887***	0.035479***	0.033380***	0.034916***
	(0.001446)	(0.001584)	(0.001495)	(0.001473)
Unemployment Rate	-0.017128***	-0.016809***	-0.018534***	-0.017294***
	(0.001798)	(0.001870)	(0.001907)	(0.001935)
Constant	-0.452622***	-0.423535***	-0.152650*	-0.422696***
	(0.090847)	(0.096747)	(0.092018)	(0.090628)
N	31,314	31,314	31,314	31,314
Log Likelihood	59744	61206	66795	68782

Note: Table displays coefficient estimates from the first stage of a Cragg-hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B20. 1st Stage of Cragg-Hurdle Regression for Number of Loans Received – Last Three Periods

Loans per Employer Establishment	Period 1	Period 2	Period 3
White Share	0.033884***	0.035786***	0.034694***
	(0.003566)	(0.003562)	(0.003348)
White Share^2	-0.000378***	-0.000398***	-0.000385***
	(0.000038)	(0.000038)	(0.000036)
White Share x Rural Ind.	-0.011831***	-0.014676***	-0.015778***
	(0.003837)	(0.003823)	(0.003587)
White Share^2 x Rural Ind.	0.000210***	0.000244***	0.000246***
	(0.000041)	(0.000041)	(0.000038)
Black Share	-0.005580	0.000105	0.007777
	(0.005099)	(0.005098)	(0.004975)
Black Share^2	0.000156*	0.000113	0.000009
	(0.000081)	(0.000078)	(0.000070)
Black Share x Rural Ind.	0.014536**	0.012728**	0.009626*
	(0.005781)	(0.005825)	(0.005623)
Black Share^2 x Rural Ind.	-0.000225**	-0.000187**	-0.000139*
	(0.000091)	(0.000090)	(0.000081)
Rural	-0.014050***	-0.013442***	-0.014035***
	(0.000727)	(0.000723)	(0.000681)
Midwest	0.835660***	0.775313***	0.760297***
	(0.034700)	(0.034270)	(0.031670)
Northeast	0.085098**	0.080094**	0.027592
	(0.035229)	(0.034921)	(0.032901)
South	0.290588***	0.277971***	0.362073***
	(0.032605)	(0.032467)	(0.030619)
% ≥ Bachelor's	0.011602***	0.010594***	0.008000***
	(0.001327)	(0.001277)	(0.001134)
Per Capita Income	-0.000001	-0.000002*	-0.000002
	(0.000002)	(0.000001)	(0.000001)
Gini Coefficient	0.035573***	0.037186***	0.036036***
	(0.001556)	(0.001567)	(0.001432)
Unemployment Rate	-0.016261***	-0.016426***	-0.015533***
	(0.001916)	(0.001988)	(0.001801)
Constant	-0.364132***	-0.435273***	-0.533324***
	(0.096834)	(0.094884)	(0.089488)
N	31,314	31,314	31,314
Log Likelihood	66689	64772	11355

Note: Table displays coefficient estimates from the first stage of a Cragg-hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B21. 2nd Stage of Cragg-Hurdle Regression for Number of Loans Received – First Four Periods

Loans per Employer Establishment	Period -3	Period -2	Period -1	Period 0
White Share	-0.002010*	-0.007232***	-0.011450***	-0.012730***
	(0.001102)	(0.000959)	(0.001021)	(0.001062)
White Share^2	0.000017	0.000024***	0.000056***	0.000057***
	(0.000010)	(0.000009)	(0.000009)	(0.000010)
White Share x Rural Ind.	0.002254	-0.000476	-0.002466*	-0.004535***
	(0.001795)	(0.001434)	(0.001468)	(0.001532)
White Share^2 x Rural Ind.	-0.000023	0.000030**	0.000058***	0.000081***
	(0.000018)	(0.000014)	(0.000015)	(0.000015)
Black Share	-0.000141	0.002281**	0.008984***	0.008479***
	(0.001108)	(0.000946)	(0.001042)	(0.001124)
Black Share^2	0.000025*	0.000031**	-0.000008	0.000005
	(0.000014)	(0.000013)	(0.000015)	(0.000016)
Black Share x Rural Ind.	-0.027419***	-0.017508***	-0.005686***	-0.001351
	(0.002660)	(0.001995)	(0.002061)	(0.002102)
Black Share^2 x Rural Ind.	0.000392***	0.000230***	0.000072**	0.000007
	(0.000045)	(0.000031)	(0.000032)	(0.000032)
Rural	-0.000363	-0.002316***	-0.002910***	-0.000821**
	(0.000405)	(0.000339)	(0.000349)	(0.000352)
Midwest	0.685658***	0.465805***	0.227445***	0.272750***
	(0.016911)	(0.014749)	(0.014861)	(0.015165)
Northeast	0.396190***	0.134546***	0.056705***	0.045774***
	(0.016274)	(0.014172)	(0.014638)	(0.015151)
South	0.097446***	0.013807	-0.137890***	0.004995
	(0.016922)	(0.014111)	(0.014255)	(0.014556)
% ≥ Bachelor's	0.007316***	0.005911***	0.004562***	0.001944***
	(0.000516)	(0.000484)	(0.000559)	(0.000626)
Per Capita Income	0.000001**	0.000004***	0.000006***	0.000006***
	(0.000001)	(0.000001)	(0.000001)	(0.000001)
Gini Coefficient	-0.006387***	-0.005840***	-0.010100***	-0.009489***
	(0.000915)	(0.000779)	(0.000827)	(0.000880)
Unemployment Rate	-0.004836**	-0.004105***	0.001011	-0.000418
	(0.002005)	(0.001559)	(0.001721)	(0.001624)
Constant	-3.353131***	-2.558446***	-2.557411***	-2.799289***
	(0.046469)	(0.039866)	(0.042310)	(0.043520)
N	31,314	31,314	31,314	31,314
Log Likelihood	59744	61206	66795	68782

Note: Table displays coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B22. 2nd Stage of Cragg-Hurdle Regression for Number of Loans Received – Last Three Periods

Loans per Employer Establishment	Period 1	Period 2	Period 3
White Share	-0.015553***	-0.017816***	-0.020716***
	(0.001032)	(0.001159)	(0.001262)
White Share^2	0.000087***	0.000104***	0.000106***
	(0.000010)	(0.000011)	(0.000012)
White Share x Rural Ind.	-0.003422**	-0.001859	-0.002553
	(0.001432)	(0.001511)	(0.001678)
White Share^2 x Rural Ind.	0.000070***	0.000059***	0.000075***
	(0.000014)	(0.000015)	(0.000017)
Black Share	0.011080***	0.026295***	0.037176***
	(0.001088)	(0.001267)	(0.001371)
Black Share^2	-0.000009	-0.000098***	-0.000196***
	(0.000015)	(0.000018)	(0.000019)
Black Share x Rural Ind.	0.000225	-0.010238***	-0.013619***
	(0.001940)	(0.002071)	(0.002256)
Black Share^2 x Rural Ind.	-0.000019	0.000089***	0.000131***
	(0.000029)	(0.000031)	(0.000033)
Rural	-0.001653***	-0.001475***	-0.001897***
	(0.000340)	(0.000357)	(0.000390)
Midwest	0.304879***	0.316870***	0.304832***
	(0.014386)	(0.015022)	(0.016601)
Northeast	0.086141***	0.039444***	0.047428***
	(0.014470)	(0.015145)	(0.016919)
South	0.075711***	0.095126***	0.155632***
	(0.013955)	(0.014652)	(0.016258)
% ≥ Bachelor's	0.001570***	-0.000990**	-0.004373***
	(0.000509)	(0.000493)	(0.000604)
Per Capita Income	0.000004***	0.000002***	0.000004***
	(0.000001)	(0.000001)	(0.000001)
Gini Coefficient	-0.009325***	-0.009257***	-0.013509***
	(0.000781)	(0.000816)	(0.000935)
Unemployment Rate	-0.000854	0.000421	0.007129***
	(0.001592)	(0.001492)	(0.001658)
Constant	-2.342284***	-2.276563***	-2.358798***
	(0.041150)	(0.044836)	(0.050580)
N	31,314	31,314	31,314
Log Likelihood	66689	64772	11355

Note: Table displays coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B23. Partial Derivatives of 2nd Stage of Cragg-Hurdle Regression for Number of Loans Received – First Four Periods

Loans per Employer Establishment	Period -3	Period -2	Period -1	Period 0
White Share	0.000191***	-0.000128	-0.000249***	-0.000176***
	(0.000066)	(0.000080)	(0.000059)	(0.000052)
White Share^2	-0.000003***	-0.000003***	-0.000001	-0.000001**
	(0.000001)	(0.000001)	(0.000001)	(0.000001)
White Share x Rural Ind.	0.000066	-0.000063	-0.000181**	-0.000309***
	(0.000094)	(0.000110)	(0.000078)	(0.000067)
White Share^2 x Rural Ind.	0.000000	0.000003***	0.000004***	0.000005***
	(0.000001)	(0.000001)	(0.000001)	(0.000001)
Black Share	0.000031	0.000101	0.000450***	0.000341***
	(0.000075)	(0.000090)	(0.000070)	(0.000063)
Black Share^2	0.000001	0.000004***	-0.000000	0.000001
	(0.000001)	(0.000001)	(0.000001)	(0.000001)
Black Share x Rural Ind.	-0.001425***	-0.001213***	-0.000208*	0.000025
	(0.000142)	(0.000156)	(0.000111)	(0.000095)
Black Share^2 x Rural Ind.	0.000019***	0.000015***	0.000002	-0.000001
	(0.000002)	(0.000002)	(0.000002)	(0.000001)
Rural	-0.000205***	-0.000349***	-0.000297***	-0.000168***
	(0.000020)	(0.000024)	(0.000017)	(0.000014)
Midwest	0.044904***	0.043940***	0.017969***	0.017836***
	(0.000947)	(0.001146)	(0.000776)	(0.000654)
Northeast	0.022590***	0.011279***	0.002289***	0.001581**
	(0.000891)	(0.001083)	(0.000766)	(0.000655)
South	0.007763***	0.003841***	-0.005517***	0.002420***
	(0.000890)	(0.001063)	(0.000741)	(0.000626)
% ≥ Bachelor's	0.000517***	0.000614***	0.000355***	0.000183***
	(0.000029)	(0.000038)	(0.000029)	(0.000026)
Per Capita Income	0.000000**	0.000000***	0.000000***	0.000000***
	(0.000000)	(0.000000)	(0.000000)	(0.000000)
Gini Coefficient	0.000101**	0.000052	-0.000120***	-0.000012
	(0.000048)	(0.000059)	(0.000043)	(0.000037)
Unemployment Rate	-0.000432***	-0.000501***	-0.000146*	-0.000186***
	(0.000103)	(0.000116)	(0.000088)	(0.000068)
N	31,314	31,314	31,314	31,314
Mean Outcome	0.046	0.067	0.045	0.037
Log Likelihood	59744	61206	66795	68782

Note: Table displays derivatives of coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. Actual coefficient estimates are not directly interpretable, and the partial derivatives must be used instead.

Table B24. Partial Derivatives of 2nd Stage of Cragg-Hurdle Regression for Number of Loans Received – Last Three Periods

Loans per Employer Establishment	Period 1	Period 2	Period 3
White Share	-0.000486***	-0.000673***	-0.000561***
	(0.000072)	(0.000085)	(0.000067)
White Share^2	0.000001	0.000002*	0.000001
	(0.000001)	(0.000001)	(0.000001)
White Share x Rural Ind.	-0.000332***	-0.000297***	-0.000281***
	(0.000092)	(0.000105)	(0.000083)
White Share^2 x Rural Ind.	0.000006***	0.000007***	0.000006***
	(0.000001)	(0.000001)	(0.000001)
Black Share	0.000563***	0.001645***	0.001746***
	(0.000086)	(0.000102)	(0.000082)
Black Share^2	0.000001	-0.000005***	-0.000009***
	(0.000001)	(0.000001)	(0.000001)
Black Share x Rural Ind.	0.000182	-0.000483***	-0.000508***
	(0.000130)	(0.000149)	(0.000118)
Black Share^2 x Rural Ind.	-0.000004*	0.000003	0.000004**
	(0.000002)	(0.000002)	(0.000002)
Rural	-0.000257***	-0.000258***	-0.000233***
	(0.000020)	(0.000023)	(0.000018)
Midwest	0.027003***	0.029349***	0.021670***
	(0.000902)	(0.001027)	(0.000820)
Northeast	0.005870***	0.003451***	0.002414***
	(0.000914)	(0.001040)	(0.000837)
South	0.007673***	0.009367***	0.010788***
	(0.000874)	(0.001001)	(0.000803)
% ≥ Bachelor's	0.000224***	0.000068*	-0.000111***
	(0.000033)	(0.000035)	(0.000030)
Per Capita Income	0.000000***	0.000000***	0.000000***
	(0.000000)	(0.000000)	(0.000000)
Gini Coefficient	-0.000114**	-0.000121**	-0.000224***
	(0.000049)	(0.000055)	(0.000045)
Unemployment Rate	-0.000238**	-0.000176*	0.000155*
	(0.000098)	(0.000099)	(0.000080)
N	31,314	31,314	31,314
Mean Outcome	0.056	0.063	0.045
Log Likelihood	66689	64772	11355

Note: Table displays derivatives of coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. Actual coefficient estimates are not directly interpretable, and the partial derivatives must be used instead.

Table B25. 1st Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee – First Four Periods

Mean Loan Amount per Employee	Period -3	Period -2	Period -1	Period 0
White Share	0.021***	0.027***	0.023***	0.027***
	(0.003)	(0.004)	(0.004)	(0.003)
White Share^2	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
White Share x Rural Ind.	-0.004	-0.007*	-0.009**	-0.014***
	(0.004)	(0.004)	(0.004)	(0.004)
White Share^2 x Rural Ind.	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share	0.003	-0.010**	0.001	-0.002
	(0.004)	(0.005)	(0.005)	(0.005)
Black Share^2	-0.000	0.000***	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share x Rural Ind.	-0.006	0.008	0.012**	0.012**
	(0.005)	(0.005)	(0.006)	(0.005)
Black Share^2 x Rural Ind.	-0.000	-0.000*	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Rural	-0.017***	-0.015***	-0.017***	-0.016***
	(0.001)	(0.001)	(0.001)	(0.001)
Midwest	0.585***	0.567***	0.360***	0.521***
	(0.032)	(0.034)	(0.033)	(0.032)
Northeast	0.372***	0.304***	0.109***	0.165***
	(0.035)	(0.037)	(0.036)	(0.034)
South	0.258***	0.255***	0.097***	0.272***
	(0.031)	(0.034)	(0.033)	(0.032)
% ≥ Bachelor's	0.014***	0.015***	0.014***	0.012***
	(0.001)	(0.001)	(0.001)	(0.001)
Per Capita Income	0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Gini Coefficient	0.029***	0.031***	0.030***	0.031***
	(0.002)	(0.002)	(0.002)	(0.002)
Unemployment Rate	-0.011***	-0.011***	-0.013***	-0.014***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	-0.223**	-0.203**	0.028	-0.196**
	(0.094)	(0.099)	(0.096)	(0.093)
N	29,787	29,787	29,787	29,787
Log Likelihood	-157966	-172278	-152206	-139513

Note: Table displays coefficient estimates from the first stage of a Cragg-hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B26. 1st Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee – Last Three Periods

Mean Loan Amount per Employee	Period 1	Period 2	Period 3
White Share	0.034***	0.033***	0.032***
	(0.004)	(0.004)	(0.003)
White Share^2	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
White Share x Rural Ind.	-0.018***	-0.017***	-0.018***
	(0.004)	(0.004)	(0.004)
White Share^2 x Rural Ind.	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Black Share	-0.013**	-0.004	0.004
	(0.005)	(0.005)	(0.005)
Black Share^2	0.000***	0.000*	0.000
	(0.000)	(0.000)	(0.000)
Black Share x Rural Ind.	0.022***	0.017***	0.016***
	(0.006)	(0.006)	(0.006)
Black Share^2 x Rural Ind.	-0.000***	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)
Rural	-0.014***	-0.014***	-0.015***
	(0.001)	(0.001)	(0.001)
Midwest	0.732***	0.612***	0.508***
	(0.035)	(0.034)	(0.032)
Northeast	0.199***	0.144***	0.085**
	(0.036)	(0.036)	(0.034)
South	0.384***	0.327***	0.391***
	(0.034)	(0.034)	(0.032)
% ≥ Bachelor's	0.012***	0.012***	0.008***
	(0.001)	(0.001)	(0.001)
Per Capita Income	-0.000*	-0.000**	-0.000***
	(0.000)	(0.000)	(0.000)
Gini Coefficient	0.032***	0.033***	0.034***
	(0.002)	(0.002)	(0.002)
Unemployment Rate	-0.013***	-0.012***	-0.013***
	(0.002)	(0.002)	(0.002)
Constant	-0.189*	-0.210**	-0.328***
	(0.101)	(0.100)	(0.093)
N	29,787	29,787	29,787
Log Likelihood	-161732	-157120	-134753

Note: Table displays coefficient estimates from the first stage of a Cragg-hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B27. 2nd Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee – First Four Periods

Mean Loan Amount per Employee	Period -3	Period -2	Period -1	Period 0
White Share	0.004**	-0.005***	-0.010***	-0.012***
	(0.002)	(0.002)	(0.002)	(0.002)
White Share^2	0.000	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
White Share x Rural Ind.	0.008**	0.006**	-0.001	-0.005*
	(0.003)	(0.003)	(0.003)	(0.003)
White Share^2 x Rural Ind.	-0.000**	-0.000	0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share	-0.007***	-0.004**	-0.003	-0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Black Share^2	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Black Share x Rural Ind.	-0.028***	-0.013***	-0.004	-0.000
	(0.005)	(0.004)	(0.004)	(0.004)
Black Share^2 x Rural Ind.	0.000***	0.000***	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Rural	0.001*	-0.001	-0.001	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Midwest	0.238***	-0.165***	-0.299***	-0.149***
	(0.029)	(0.026)	(0.028)	(0.028)
Northeast	0.278***	0.009	-0.010	-0.032
	(0.028)	(0.026)	(0.028)	(0.028)
South	0.034	-0.111***	-0.232***	-0.079***
	(0.028)	(0.024)	(0.026)	(0.026)
% ≥ Bachelor's	0.004***	0.005***	0.005***	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Per Capita Income	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Gini Coefficient	-0.011***	-0.006***	-0.010***	-0.012***
	(0.002)	(0.002)	(0.002)	(0.002)
Unemployment Rate	0.003	0.006*	0.007**	0.002
	(0.004)	(0.003)	(0.003)	(0.003)
Constant	5.388***	5.953***	5.773***	5.466***
	(0.084)	(0.076)	(0.079)	(0.080)
N	29,787	29,787	29,787	29,787
Log Likelihood	-157966	-172278	-152206	-139513

Note: Table displays coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B28. 2nd Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee – Last Three Periods

Mean Loan Amount per Employee	Period 1	Period 2	Period 3
White Share	-0.013***	-0.013***	-0.015***
	(0.002)	(0.002)	(0.002)
White Share^2	0.000**	0.000***	0.000**
	(0.000)	(0.000)	(0.000)
White Share x Rural Ind.	-0.007***	-0.009***	-0.010***
	(0.003)	(0.003)	(0.003)
White Share^2 x Rural Ind.	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Black Share	-0.004**	0.007***	0.017***
	(0.002)	(0.002)	(0.002)
Black Share^2	0.000***	0.000***	0.000
	(0.000)	(0.000)	(0.000)
Black Share x Rural Ind.	-0.001	-0.000	0.004
	(0.004)	(0.004)	(0.004)
Black Share^2 x Rural Ind.	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Rural	0.002***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)
Midwest	0.026	-0.000	-0.007
	(0.027)	(0.027)	(0.029)
Northeast	0.013	-0.108***	-0.095***
	(0.027)	(0.027)	(0.030)
South	0.045*	0.000	0.071***
	(0.025)	(0.025)	(0.028)
% ≥ Bachelor's	0.001	-0.002	-0.006***
	(0.001)	(0.001)	(0.001)
Per Capita Income	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Gini Coefficient	-0.011***	-0.012***	-0.017***
	(0.002)	(0.002)	(0.002)
Unemployment Rate	-0.003	0.005**	0.008**
	(0.003)	(0.003)	(0.003)
Constant	5.823***	5.590***	5.311***
	(0.075)	(0.076)	(0.083)
N	29,787	29,787	29,787
Log Likelihood	-161732	-157120	-134753

Note: Table displays coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate.

Table B29. Partial Derivatives of 2nd Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee – First Four Periods

Mean Loan Amount per Employee	Period -3	Period -2	Period -1	Period 0
White Share	5.795***	0.838	-1.264	-0.638
	(1.181)	(1.190)	(0.769)	(0.520)
White Share^2	-0.040***	-0.022*	-0.008	-0.014***
	(0.011)	(0.012)	(0.008)	(0.005)
White Share x Rural Ind.	3.288*	2.594	-1.293	-2.286***
	(1.725)	(1.701)	(1.120)	(0.725)
White Share^2 x Rural Ind.	-0.021	-0.006	0.032***	0.037***
	(0.018)	(0.017)	(0.012)	(0.008)
Black Share	-3.001**	-4.149***	-0.933	-1.200**
	(1.297)	(1.272)	(0.853)	(0.593)
Black Share^2	0.044**	0.067***	0.032***	0.028***
	(0.017)	(0.018)	(0.012)	(0.008)
Black Share x Rural Ind.	-15.758***	-6.738***	-0.215	1.016
	(2.699)	(2.497)	(1.651)	(1.038)
Black Share^2 x Rural Ind.	0.201***	0.082**	0.010	-0.012
	(0.044)	(0.039)	(0.026)	(0.016)
Rural	-2.364***	-2.764***	-2.050***	-0.697***
	(0.357)	(0.355)	(0.229)	(0.150)
Midwest	230.961***	-15.950	-71.017***	8.766
	(16.461)	(16.838)	(11.041)	(6.966)
Northeast	212.814***	52.220***	7.978	6.397
	(16.490)	(16.912)	(10.873)	(7.082)
South	64.831***	-30.416*	-74.913***	4.417
	(15.988)	(16.007)	(10.416)	(6.623)
% ≥ Bachelor's	4.845***	5.641***	3.346***	1.522***
	(0.570)	(0.709)	(0.456)	(0.317)
Per Capita Income	0.003***	0.006***	0.004***	0.003***
	(0.001)	(0.001)	(0.001)	(0.000)
Gini Coefficient	-0.353	0.778	-0.379	-0.231
	(0.916)	(1.003)	(0.643)	(0.429)
Unemployment Rate	-0.232	1.731	1.007	-0.761
	(1.987)	(1.842)	(1.240)	(0.758)
N	29,787	29,787	29,787	29,787
Mean Outcome	524.39	607.85	367.63	253.48
Log Likelihood	-157966	-172278	-152206	-139513

Note: Table displays derivatives of coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. Actual coefficient estimates are not directly interpretable, and the partial derivatives must be used instead.

Table B30. Partial Derivatives of 2nd Stage of Cragg-Hurdle Regression for Mean Loan Amount per Employee – Last Three Periods

Mean Loan Amount per Employee	Period 1	Period 2	Period 3
White Share	-1.380*	-1.278*	-0.678
	(0.771)	(0.672)	(0.436)
White Share^2	-0.023***	-0.018***	-0.016***
	(0.008)	(0.007)	(0.004)
White Share x Rural Ind.	-4.456***	-4.388***	-3.127***
	(1.075)	(0.938)	(0.602)
White Share^2 x Rural Ind.	0.077***	0.069***	0.050***
	(0.011)	(0.010)	(0.006)
Black Share	-2.980***	1.840**	3.518***
	(0.866)	(0.764)	(0.516)
Black Share^2	0.064***	0.037***	0.003
	(0.013)	(0.011)	(0.007)
Black Share x Rural Ind.	1.788	1.460	1.737**
	(1.477)	(1.288)	(0.839)
Black Share^2 x Rural Ind.	-0.010	-0.004	-0.009
	(0.023)	(0.020)	(0.012)
Rural	-0.793***	0.217	-0.087
	(0.233)	(0.198)	(0.125)
Midwest	83.578***	55.023***	32.774***
	(10.582)	(9.130)	(5.987)
Northeast	25.067**	-22.054**	-12.402**
	(10.871)	(9.436)	(6.125)
South	55.626***	29.571***	39.764***
	(10.210)	(8.803)	(5.706)
% ≥ Bachelor's	1.481***	0.533	-0.682**
	(0.481)	(0.370)	(0.271)
Per Capita Income	0.004***	0.003***	0.002***
	(0.001)	(0.000)	(0.000)
Gini Coefficient	-0.850	-0.962*	-1.012***
	(0.611)	(0.517)	(0.343)
Unemployment Rate	-2.444**	0.620	0.600
	(1.022)	(0.853)	(0.621)
N	29,787	29,787	29,787
Mean Outcome	408.04	354.57	205.29
Log Likelihood	-161732	-157120	-134753

Note: Table displays derivatives of coefficient estimates from the second stage of Cragg-Hurdle regression with * denoting p<0.1, ** denoting p<0.05, and *** denoting p<0.01. Robust standard errors are shown in parentheses below each coefficient estimate. Actual coefficient estimates are not directly interpretable, and the partial derivatives must be used instead.