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The 421-a tax abatement program: Affordable housing policy and its effect on characterizing Brooklyn communities

Jonathan Hong
Vassar College, johong@vassar.edu

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The 421-a Tax Abatement Program:

Affordable Housing Policy and its Effect on characterizing Brooklyn
Communities

Jonathan Hong, Vassar College

25 April 2016

Senior Thesis

Submitted in partial fulfillment of the requirements

For the Bachelor of Arts in Urban Studies

Adviser, Dustin Frye

Adviser, Tyrone Simpson

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Abstract

This paper focuses on the 421-a Tax Abatement Policy by analyzing data on Brooklyn communities in New York City. The paper is motivated by my experience as an Urban Studies Major attempting to incorporate my Economics background as well as my passion for New York City and its urban development. I will use regression analysis to look at the Geographic Exclusion Area (GEA) designated by the city, which requires creation of affordable housing in order to receive important tax benefits towards the development projects. The data analysis shows that although there exists an initial positive outcome from the policy treatment, in the long term there appears to be larger negative effects that work against the goals of the 421-a Program. The variables of interest are Household Income, Minority Status, English Ability, and Citizenship. One of the major assumptions of the paper is that once a space is designated as GEA, there is an intangible change that signals to the community that the space is more affluent. This paper finds that the Geographic Exclusion Area plays an important role in its designation of a space and the fact that GEA spaces are empirically wealthier.

Introduction.

New York City, the Big Apple, one of the largest economic hubs in the world and an icon of Western Development, known by many names and titles – it is nearly indescribable in its diversity and influence. New York City is constantly expanding upward in economic as well as developmental growth. One cannot experience New York City and the urban jungle without also experiencing the growth process. Walking down Broadway as well as countless other major avenues, construction and renovation relentlessly expel hammer strikes into the atmosphere lending character to the city. One specific construction project just off Broadway - 45 East 22nd Street in the Flatiron District, a luxury condominium Tower - is a project where I had the privilege to experience the inner workings of its development at the Continuum Company. Another project in the pipeline for this firm was a building in Harlem that qualified for the 421-a Tax Abatement Program. It was in this office where I was exposed to the concept of affordable housing tax abatement programs; often containing requirements of a certain proportion of the building to be market rate housing and a certain proportion to be affordable, both of which had to be in the same structure in order to receive the tax abatements.

Originally created as a housing development program in New York City, it became an affordable housing program that developers utilized in order to receive tax abatements towards market rate projects in return for the subsidization of affordable housing units. Many government policies have a specific focus aimed to encourage particular behavior in the market by providing economic benefits – however there also exist incalculable externalities that result, indirectly or not, in changing the shape of the

city. What does The City look like? This question could be asked to thousands of individuals - tourists, families, entrepreneurs, minorities, and children - every single response could and likely would be completely different.

In analyzing the role of and development of the 421-a tax abatement program, I hope to understand a little more about the part it has played in the shaping of the contemporary city. One of the major tools that I will use to help me analyze Brooklyn will be what is known as the Geographic Exclusion Area (GEA). The GEA is important because by understanding how political boundaries are labeled as such, this gives us information as to where developers can develop buildings that receive tax abatements but more importantly, information as to where developers are incentivized to build.

Essentially, spaces that are labeled as GEA require the developers to build affordable housing in new buildings that are developed. This designation is central to the economic analysis of this paper as it tells me multiple pieces of important information. First, it labels the geographic area in New York City where developers are required to implement additional affordable housing program requirements. This allows me to generalize that because developers are bound to follow certain rules in these spaces, statistics in the data are representative of overall trends in the population. Second and arguably more important is the significance of the name in itself. One of the assumptions of this paper is that by designating a space as part of the Geographic Exclusion Area, it signals to residents that certain qualities of community are thereafter expected in that space. I think that it's an important assumption to make in understanding the change of movement through spaces.

To reiterate, what does it mean for a space to be labeled GEA and what implications follow from that reasoning. Are spaces that are already affluent labeled as GEA in order to increase the amount of mandatory inclusionary housing developed in the neighborhood? If so, what possible motives might there be for this? Or do spaces change after the designation of GEA to more affluent spaces? I think it important to understand the designation of tax abatement areas because questions similar to those that I have listed previously will help create discourse to improve future policies. The data shows that communities in the Geographic Exclusion Area on average have a higher household income and hourly wage. I think it relevant to explore possible reasons for this outcome.

There are a few empirical challenges in measuring the effects of GEA areas that I have had to work through. In other words, there can exist a decent amount of noise that will make it a little more difficult for me to answer my question because there could be other factors affecting income distribution for example, other than the GEA designation. One thought is that although existing spaces in Brooklyn may have been labeled GEA because of their affluence, others may have been labeled so because of their proximity to these already affluent spaces in Brooklyn where policymakers are making the assumption that in the near future, these peripheral spaces will rapidly gentrify. GEA designation does not necessarily stimulate 421-a development in the area because there are a variety of factors that go into the developer's decision to build a building. However from a cost-benefit perspective, developers want to build in the GEA because they can expect higher profit margins after accounting for the tax abatements.

What the label may cause is a change in marketing of the area. If landlords see that their community has been labeled as GEA, and the rent is currently lower than other

areas in Brooklyn, they may assume that policymakers are anticipating a rise in affluence in the area. This has the potential to create a self-reinforcing system where landlords now see the space as more valuable, and raise rents or slowly start renting to and attracting individuals with higher incomes and potentially less racial diversity (Reiss, 2016).

However, in contrast but yielding a similar outcome, young urban professionals see the designation as a sign that the neighborhood is up and coming and move in those directions offering higher rent.

To give the reader further background on what I mean by the shape of the city it is relevant to understand spaces of exclusion within cities and I think it is pertinent to bring in my own personal experience to establish relevance of this research to my interests. For the majority of my life and my time as a student at Vassar I experienced New York City as a tourist. Every event that I attended or restaurant that I went to could be easily found on the Internet, I had no real connection to any of these places and although my ability to navigate the subway and streets increased, my knowledge of the city was tremendously limited. Not that I knew this at the time however, it only became clear to me during my internship experience this past summer while living in New York City. A list of notable city experiences will likely serve to illustrate this point in the most powerful and concise manner. Over the course of 2 short months:

- I became close to the family that owned the whole-in-the-wall breakfast and convenience shop adjacent to the building that I worked in. Every morning I would walk in to buy breakfast and I would converse with them for a few minutes. I heard about their vacation plans and the sports teams that they followed. One of the men told me about his best experiences going to Mets games

at Citi Field. The mother of the family told me about how they had owned the shop for decades and how the Flatiron District had changed around them.

- I found a small Asian market on 57th and 6th which I frequented about once a week because of its proximity to my place of residence. This was a place that I would never have walked into otherwise.
- I became close to the owners of the small ramen shop near where I was living.
- The people that I frequented the gym with at 6 am became an instant community. Getting close with the trainer that ran the 6 am class, I learned a lot about the inside of the Broadway industry as he was an actor as well as a trainer. I learned of his hour long commute to the gym at 56th and 10th from Queens and how he would wake up at 4:45 AM to get to work on time.

All of these personal experiences have one thing in common – I was able to *intimately* relate to the people within Manhattan that were previously excluded to me before that. It should be clear that all of these anecdotes are notable largely because of their relation to human beings highlighting the fact that by and large it is the people that make the space what is it. Without understanding that, one will never be able to understand the city. By getting to know and understand the daily rituals and lives of these people, I slowly started to scratch the surface of truly experiencing a space. Understanding the character of the city is of integral importance to the motivation of this thesis because although this paper is largely understood through data analysis and regressions, I think it important to always keep in mind the goals and the fundamental human relationships that we aim to produce in policy implementation.

This thesis aims to dissect and compare the Brooklyn Community in regards to government policy and its effect on shaping communities. The reason I introduced what will largely be a paper supported by economic analysis with anecdotes in an unorthodox manner is because my motivation for understanding affordable housing policy has stemmed from the theory and conversations that I have had in my classes with the Urban Studies department. As a thesis for the Urban Studies Department, I feel it necessary to outline some of the key motivation for my thought process. With that being said, economic regression analysis will be a large part of the ongoing paper and I will talk in more detail about how I went about setting up and maneuvering through the data. Furthermore, I had the pleasure of meeting with a Brooklyn Law Professor and talking through the change in spaces over time as well as his thoughts on 421-a as an affordable housing development program. As I have no personal experience in any of the spaces that I will be studying, it seems pertinent to receive firsthand understanding of people and how they view their communities. Aggregating this information will shed light on the specific question that I intend to answer, *how does the 421-a tax abatement program change the shape of the city and the communities within?*

421-a.

The 421-a Tax Abatement Program was put in place in 1971 to prompt development of residential buildings during a relatively sluggish housing market (ANHD, 2015). In essence, tax abatements are government spending over time as it is simply creating an economic incentive process for certain groups and organizations to follow policies by waving the need to pay taxes. Over time this program developed into a certificate based program where market rate developers were able to purchase affordable housing certificates in order to receive tax abatements. The cash used to purchase the certificates would then go directly to affordable housing developers within New York City and directly subsidize the construction of affordable housing units. The benefits granted to market rate developers are essentially that as the value of the property grows over the construction period, the developer will be exempt – depending on the program – from paying taxes on the property for a given period of time; either 10 years, 15 years or 25 years (See Figure 1 for details). From this revised program spawned the argument that the tax breaks given to market rate developers and the benefits that they were receiving (or costs to the city) far outweighed the benefits that affordable housing developers were receiving.

BENEFITS GRANTED	<p>Construction period exemption (up to 3 years) plus 10-year (2 years full + 8 years phase out), 15-year (11 years full + 4 years phase out), 20-year (12 years full + 8 years phase out), or 25-year (21 years full + 4 years phase out) post-construction exemption from the increase in real estate taxes resulting from the work.</p> <p>The longer exemption periods apply in northern Manhattan, the other boroughs, other designated areas, and to projects that receive governmental assistance or contain 20% affordable units.</p> <p>All market rate rental units become subject to rent stabilization for the duration of the benefits, with initial rents approved by the Tax Incentive Programs (TIP). Affordable rental units are rent stabilized for 35 years.</p>
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Figure 1 - (NYC, HPD)

In response to critics of these programs the rules were revised July 1, 2008 to expand what is called the Geographic Exclusion Area (GEA), which essentially delineates the area where additional affordable housing requirements must be met in order to receive tax abatements. To restate a key connection of this paper, the GEA and its relation to the 421-a program is that the developer is required to provide affordable housing in order to receive the benefits listed in Figure 1, essentially incentivizing the creation of affordable housing in geographic locations that would otherwise be higher rent real estate. Major changes from the previous system are as follows:

- The elimination of as-of-right 25 year benefits
- Limit on tax benefits that Market-Rate Developer can receive (AV Cap)
- Elimination of Negotiable Certificate Program; must provide on-site affordable housing in order to receive tax benefits
- Major expansion of the GEA into areas in Brooklyn and Queens
- Authorizes HPD to create a dedicated fund for affordable housing
- Reserves 421-a tax benefits for buildings with a minimum of four units
- Community preference for affordable units in GEA
- Specified unit and bedroom mix

- 35-year affordability and rent stabilization requirements
- Prevailing wage requirement
- Creates a Boundary Review Commission

(NYC HPD, Updated 7 February 2013)

The idea behind analyzing the major changes to the 421-a Program is that I can see whether the program succeeded in achieving any of these clearly outlined goals. From this list the main regression equation will focus on the Household income within the new GEA because of the elimination of the Certificate Program. The rent of units in the GEA should decrease on average, as there is rent stabilization for up to 35 years.

The current system is now known as the 80/20 Program. From the perspective of an urban theorist, this new policy places a much larger importance on the value of space. The 80/20 Program requires that the developer provide at least 20 percent of the development at an affordable housing rate within the same building, usually at a rate that is affordable for 60 percent of the Area Median Income (AMI). The distinguishing factor is that the affordable housing must be provided onsite. In addition, there has been an implementation of a new program that goes into effect for projects under construction after January 1st, 2016. The new program would give rental projects and developers the option to choose between three different variations of affordability levels in order to receive the benefits of the program.

New Program - 421-a Changes in effect January 1, 2016

Option A	
Benefit Provided	100% exemption up to three years
Required Affordable Units	25%
Affordability Level	10% at 40% AMI, 10% at 60% AMI, 5% at 130% AMI
Additional Requirements	Cannot receive government subsidies except for tax exempt bonds
Duration of Affordability	35 years

Option B	
Benefit Provided	100% exemption up to three years
Required Affordable Units	30%
Affordability Level	10% at 70% AMI, 20% at 130% AMI
Duration of Affordability	35 years

Option C	
Benefit Provided	100% exemption up to three years
Required Affordable Units	30%
Affordability Level	30% at 130% AMI
Additional Requirements	Cannot receive government subsidies or be located south of 96th Street, Manhattan
Duration of Affordability	35 years

Data used to create the table taken from NYCHPD website.

At a glance, we can see the difference between the three options. Option A would give a wide range in terms of the types of ‘affordable tenants’ that the rental property would attract, Option B has more affordable units required overall but a larger portion of them would be able to be rented to individuals that make 130% of the of Area Median Income, and lastly Option C would require the developer to again have a larger proportion of affordable units but be able to rent at a higher rate to individuals with higher incomes with the condition that they receive no other government subsidies. The

type of developer as well as what type of unit they would be hoping to create would largely dictate the option that a developer would choose. What they all have in common however is that developers are still being incentivized to build in these areas after accounting for the tax abatements and number of affordable units.

This effort to integrate and diversify the communities in regards to socioeconomic status (which often correlates highly with ethnicity/race) is what I would like to focus on. The policy that is being implemented has a specific goal and I would like to understand exactly how this policy changes the space in these communities. What is it like to walk down the streets? Have there been drastic changes in the characteristics of the community after policy implementation? Variables such as commute time, quality of public schools, etc. differ considerably depending on their location within New York City. A relatively new development, One57 on Central Park South is not in the least comparable to the South Bronx. Having discussed these changes and keeping them in mind I will now turn my focus to similar papers done previously to give a better sense of affordable housing policy in the academic world.

Literature Review.

The Pratt Center for Community Development released a paper on “Understanding the NYC ‘421-a’ Property Tax Exemption Program”. In summary, the Pratt Center takes a very negative viewpoint on the Tax Abatement Program and its true benefits to the communities in New York City. It highlights that 421-a costs the city government over \$300 million dollars in forgone tax revenue per year. Furthermore, the paper focuses on 1985 – 2002 where only 36% of the units in New York City built in that time frame utilized the 421-a program. The last few sections of the paper focus on the lack of merit that the program has towards achieving the goals set forth by policymakers. Specifically emphasizing that it benefits the market rate developers in more ways than affordable housing recipients benefit. Lastly the Pratt Center questions the validity of the off-site ‘certificate’ system which can be better understood in an analysis of One57, a luxury tower on Central Park South and beneficiary of the certificate 421-a program.

The One57 tower has received criticism because of the tax benefits that it received while also setting record sales with the most expensive penthouse in New York City. This particular study is interesting and relevant because of the overall outcome that the study finds. The Independent Budget Office acknowledges that it’s important to remember that the building is not representative of the buildings that have historically received 421-a benefits. An important point to take away from the study is the fact that it breaks down the financing of the developments down to the cost per unit for the city that I think is very valuable analysis. “The 421-a abatement for One57 is generating 66 units of affordable housing in the Bronx at a cost of \$905,000 per apartment. Had the city provided an affordable housing developer with a cash grant equal to the amount of

One57's 421-a tax expenditure, IBO estimates that nearly 370 affordable apartments at a cost of \$179,000 per unit could have been produced" (IBO, 2015). As mentioned earlier, the study ultimately finds that in this particular case study, the 421-a program was not utilized to maximize affordable housing within the city. However the study also raises important questions in regards to the thesis of this paper in terms of policy implications.

"Many of the arguments for and against 421-a overlook important elements of the city's property tax system that if acknowledged could inform public debate. For instance, the argument that 421-a should be abolished or reformed because it is not a cost-effective means of producing affordable housing often fails to consider whether there are alternative policies that are more cost-effective than 421-a in its current form. Moreover, much of the criticism leveled at One57 and its 421-a benefit – that the building's wealthy condo owners enjoy lower taxes than property owners who are less well off – has in fact less to do with 421-a than with how the city is required to value condos and coops for tax purposes" (IBO, 2015).

Understanding this argument is an instrumental piece in understanding the paper on One57 as it aims to use census data to validate some of the arguments that are made against 421-a but more importantly to provide perspective from which to suggest policy recommendations.

The NYU Furman Center released a State of Land Use and Built Environment report following 2014. In this report we see a general overview of building developments throughout New York City. Relevant to this paper is the fact that the number of

affordable units generated through the Inclusionary Housing Program more than doubled from the previous year and reached an all time high since the 2008 financial crisis.

Furthermore the paper introduces the concept of the Inclusionary Housing Program in New York City. This is highly pertinent to understanding the 421-a tax abatement program because there are certain parallels than can be drawn between the two. In some cases, developers are allowed to implement both programs in a single building development.

NYC Inclusionary Housing Program – Why It’s Different and Where It’s Similar

Part of understanding the incentive process for creating affordable housing in New York City is looking at the other options that are available to developers should they want to get the most leverage for their money. The Inclusionary Housing Program is the other main option that many market rate developers utilize in order to receive benefits in their development projects. The space that it is available is slightly different than the Geographic Exclusion Area because off-site affordable housing is allowable whereas in order to receive 421-a tax abatements, the affordable housing must be provided on-site. In addition, the Inclusionary Housing Program provides additional zoning density and FAR (Floor-Area-Ratio) for the development as opposed to tax abatements. In other words, instead of minimizing future payments, it increases the opportunity for developers to receive income. Specifically, instead of having legal zoning rights to build no more than 100 units on a specific piece of land, should the developer provide the maximum amount of affordable housing units off-site, they would be eligible to increase their FAR up to an additional 20 percent. In this case, the developer would be allowed to build a further 20 units and likely profit heavily from the high rent per square footage. Furthermore the Inclusionary Housing Program allows the affordable housing projects to be made affordable to households that are making at least 80% Area Median Income as opposed to 421-a which requires the on-site affordable housing to be made available to households that make 60% of the Area Median Income (Madar, 2015). This comparison is delineated clearly in the following table. The important piece to understand from this comparison is the idea that although the Inclusionary Housing Program is more accessible and does not forgo the needed tax revenue, it stretches the definition of

‘affordable’ and creates a policy that potentially encourages socioeconomic segregation within New York City.

Summary of 421-a and Inclusionary Housing Program

	421-a	Inclusionary Housing Program
Benefit Provided	Property Tax Exemption	Additional Zoning Density
Required Set-Aside	20%	20%
Affordability Level	60% AMI	80% AMI
Duration of Affordability	35 years	Permanent
Off-Site Option	No	Yes

Source: Madar, 2015. Inclusionary Housing Policy in New York City. NYU Furman Center.

This is relevant in the data analysis in thinking about how to sample the number of inclusionary housing projects in the area, as this will probably affect the household income distribution regressions that I will be looking at. As I mentioned earlier, because buildings with the inclusionary housing program are likely to have higher overall incomes, the average income of the non-GEA spaces will increase because you are incentivized to use the 421-a program. Acknowledging this policy as congruent to the 421-a GEA poses an issue in the data, as there is no specific time in which the Inclusionary Housing Policy was expanded. It is however helpful to understand other government policies in action around the same time as 421-a and this will be reflected in the data.

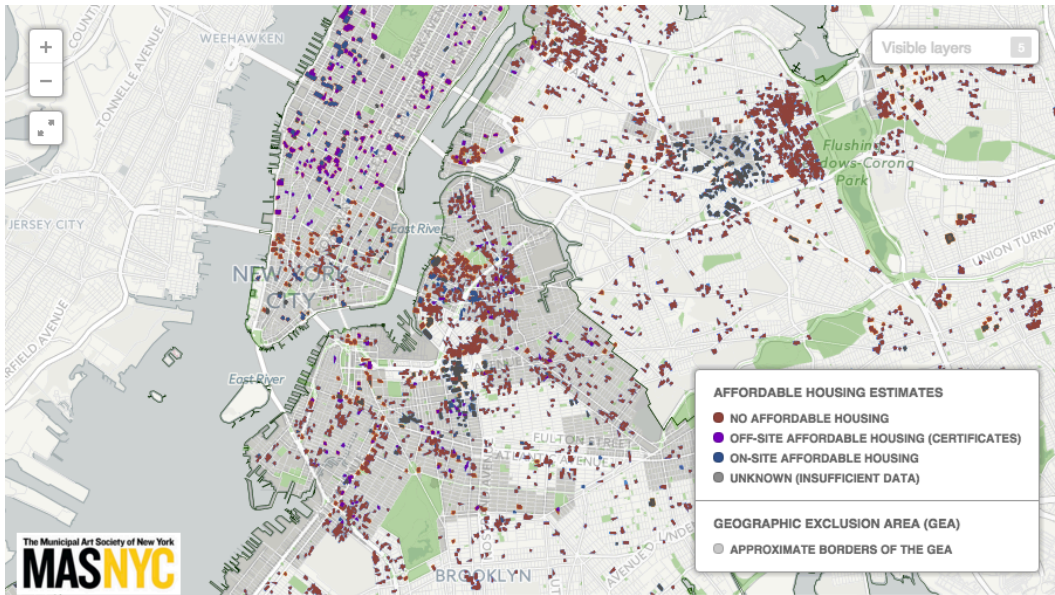


Figure 2.
(MAS, New York)

In the image above, we see buildings under the certificate program in purple and buildings created with 421-a in blue. Focusing on Brooklyn, it is clear that many of these affordable housing buildings are spread throughout the borough without any strong concentration in any one spot. Again, this is why it is important that I make the central assumption that the designation of the space as GEA plays a causal role in understanding the types of people that live there and the types of households that will develop after its designation.

Methods.

The key idea behind the empirical design of the paper is that I am comparing GEA areas to non-GEA areas in Brooklyn. I am comparing places that are geographically very similar and assuming that the growth rates of these PUMAs¹ should be roughly the same in terms of income. When the geographic exclusion area is implemented in parts of

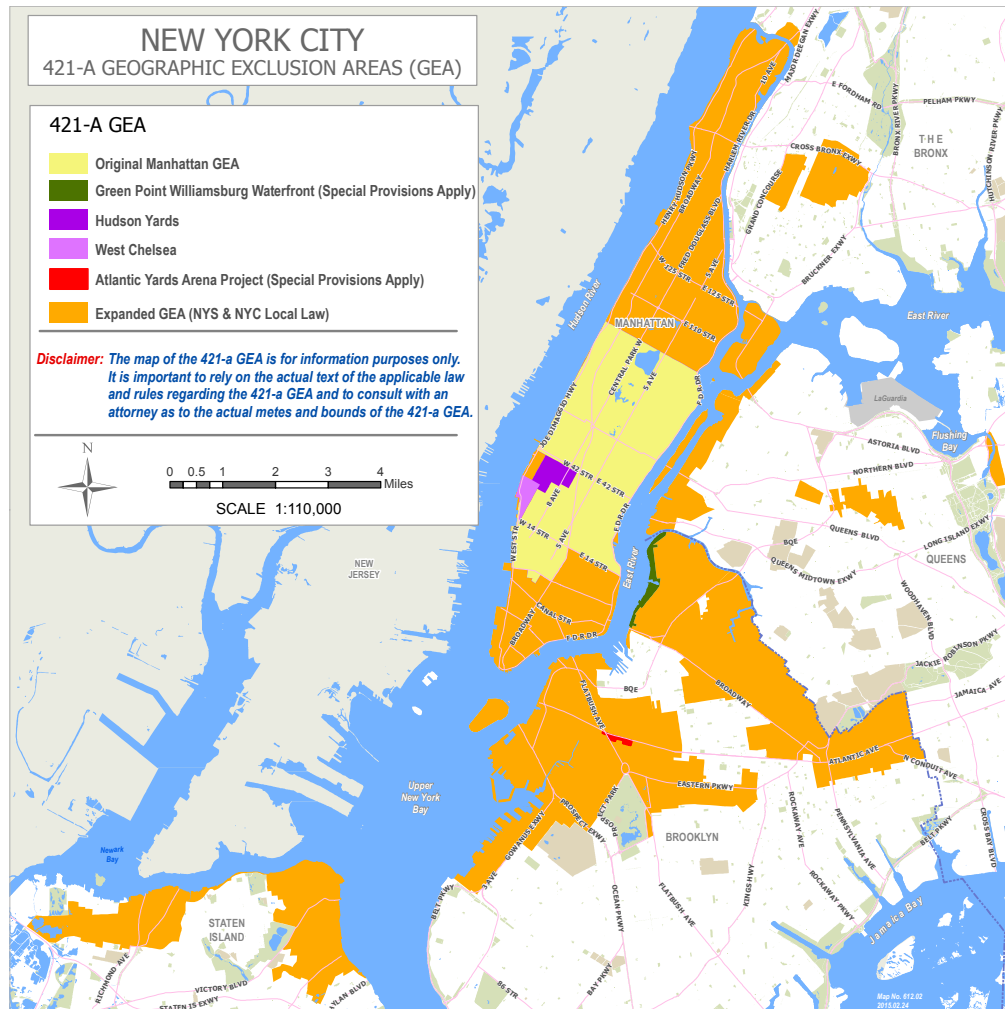


Figure 3 – GEA as of July 1, 2008 (NYC, HPD 2008)

Notes: This map shows the expanded GEA in Brooklyn in the color orange. This is the space where additional 421-a tax abatement programs apply.

¹ The census data year selections are based on the PUMA availability and the census years that the ACS recorded the PUMA variable. PUMA stands for Public Use Microdata Area and is the main variable of focus in this paper as it aims to describe the change in characteristic composition between different spaces that may or may not have been affected by the GEA.

Brooklyn, this changes the way in which residents view the neighborhoods. I argue that because of this designation, residents and building owners alike feel the need to fulfill the expectations of what they think the space should look like. I believe that there exist some causality effects between the GEA designation and the increase in income of those particular spaces. I acknowledge that it is possible there is something intrinsically different about a GEA space before it is designated as such. The timeline that I am operating on is that the GEA spaces in Brooklyn were designated as such in the middle of 2008. What I expect to find is that prior to 2008, the two groups trend similarly and then when the designation happens in 2008, the two spaces start to trend differently.² Basically I will compare two different spaces that theoretically have similar growth rates and are very close geographically to one another. After looking at the time when the treatment is put in place, the two growth rates should change. This gives a strong implication that the treatment, in this case the implementation of the 421-a tax abatement program in parts of Brooklyn, caused or at least is highly correlated with the change in trend. A large confounding factor in this analysis is the fact that the financial crisis occurred around that same time that the GEA was put in place. Theoretically this exogenous event should affect both sets of incomes in roughly the same way however an argument could be made that those with lower income would be hit harder than others. I have done my best to minimize this effect as I accounted for inflation in all of my variables. The regression that I will be using will follow a simple linear format:

² Data is taken from the American Community Survey from the Integrated Public Use Microdata Series (IPUMS) from the census years 1990, 2000, 2005-2014.

$$(1) \text{HouseHoldIncome} = \beta_0 + \beta_1 \text{brooklyn_GEA} + \beta_2 \text{GEA_After} + d_t + x'\gamma + \varepsilon_0$$

The regression analysis will focus on the effect of GEA space on the House Hold income of residents living in these spaces accounting for different time horizons, before and after the implementation of the GEA in Brooklyn.³ The Household Income Variable follows the household income of residents living in the Brooklyn PUMAs from the years 2000, 2005 – 2013. The Brooklyn_GEA variable describes the Brooklyn PUMAs that were designated at any point in time as GEA and those that are not. Lastly the GEA_After variable describes the before and after 2008 and the implementation of this policy for the relevant Brooklyn PUMAs. The x' variable denotes the controls that are accounted for in the regression; among them are minority status, immigrant status, citizenship, good English ability and family size. The d_t are dummy variables for the time which are accounting for in the regression and the ε_0 is the error term.

³ Top Coding the super rich will be an issue in focusing on income studies and home values of extremely wealthy individuals have 9,999,999 listed as their income/home value. For the proportion of residents that maintain household incomes and individual incomes that are extremely high, the ACS enters an extremely large number for those data points. These numbers are not truly representative of their correct values and so must be listed as missing in the cleaned data. In some of the variable sets based on PUMA location, upwards of the top 15 percent of people had missing values.

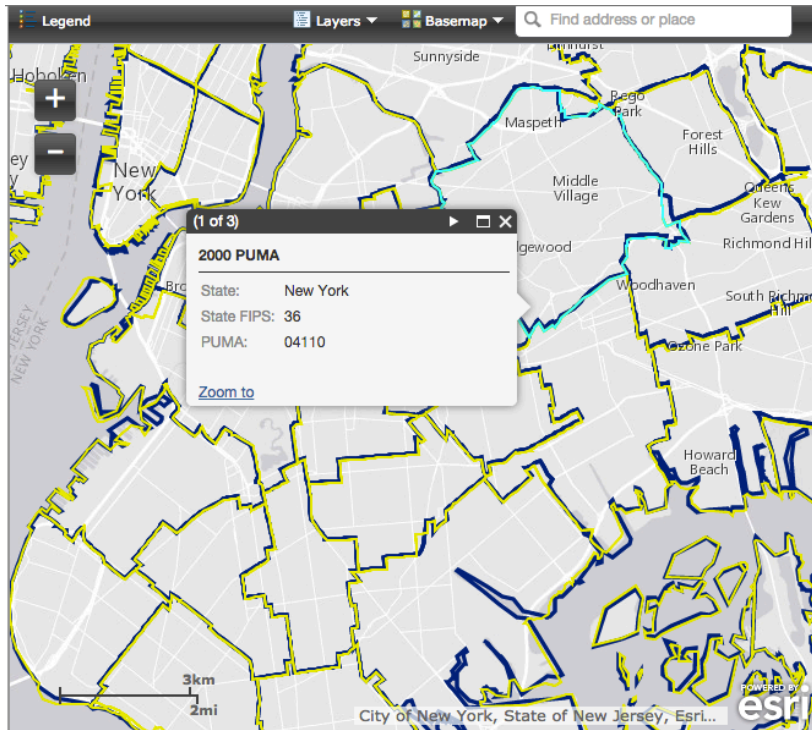


Figure 4.
(IPUMS, PUMA 2010)

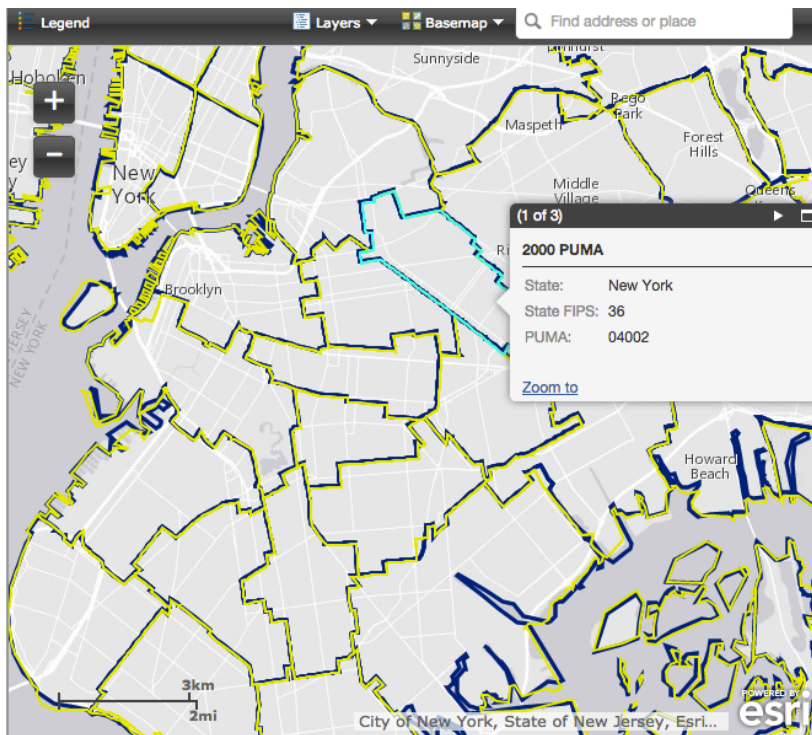


Figure 5.
(IPUMS, PUMA 2010)

By focusing on the new GEA as of 2008, I will concentrate on the question in regards to the how inclusionary housing zoning has affected the space and shape of the city. The PUMA's shown above, PUMA 04002 and PUMA 04110 are geographic areas in Brooklyn, New York. They are of specific interest because Brooklyn is a location where 421-a is relatively constant throughout the entire space as opposed to Manhattan. In addition they straddle the line between new GEA and not, rendering it a comparable choice to show differences between community demographics. The foremost dependent variable that I will be focusing on is the household income of people living in these neighborhoods.

The economic analysis of this paper is supported by a number of preliminary steps that are necessary to formulate the variables I will focus on in the dataset. I analyzed Figure 3, the map of the GEA as of 2008 and matched the map with the PUMA variable map from the IPUMS website shown in Figures 4 and 5. This gives me a relative understanding of the equivalent IPUMS PUMA delineations that are currently labeled as GEA spaces. From this analysis I found that the entirety of PUMA locations 4001, 4002, and 4005 in Brooklyn were made part of the new GEA in 2008. I trimmed the dataset down to PUMA locations that only represented locations in Brooklyn and created a random variable *brooklynGEA* that highlights the previously mentioned PUMA locations. I also created random variables for Good English, Citizenship, Employment Status, and Immigrants, which I will use as controls.

Data.

I will be using the American Community Survey (ACS) Data with specific geographic focus on the PUMA Variable. PUMA stands for Public Use Microdata Area – in other words, where the housing unit is located (IPUMS, 2015).

Sample Restrictions

- Individuals Born abroad to American Parents
- Immigrants who's age of immigration is less than 0
- Individuals with Top Coded Household Income will be listed as missing
- Individuals with Top Coded Total Individual Income will be listed as missing

The reasoning behind listing top-coded individuals as missing instead of simply dropping them from the data is because since this is not an income study and I am not focusing directly on income, many of these individuals may serve as important pieces of data in terms of other variables. The controls that I chose for the regression are important because of their clear social effects on income. They control the regression so that the focus on the change of Brooklyn GEA is highlighted and accounted for.

Part of understanding the data is also the fact that the 170,000 of the 330,00 people in the data set are not working. This is probably due to the fact that the bottom quartile of the data is under the age of 20 and is therefore not likely to be working full-time jobs or at least reporting any income. This is one of the reasons that I will be looking at the Household Income variable primarily, as it encompasses a larger portion of the people represented in the data. I decided to keep individuals in the data set under the age of 20 that are not reporting income because although they may bring down the average income significantly, they play an important role in analyzing households in Brooklyn. I

am trying to answer a question that focuses on the affordable housing programs and the extent to which they are effective at introducing families and people of lower socioeconomic status to the neighborhood. I also created an age of immigration variable and dropped anyone whose age of immigration was negative as this means they misreported data. I want to see how well the policy changes diversity in the neighborhood and immigrants are more likely to have lower incomes on average however I also want people that are considered first generation and not misreported so that my immigrant summary statistics are not skewed in any way. One of the regressions will account for the differences between household income and the natural log of household income. Taking the natural log of the wage is necessary because it accounts for the difference in scale between individuals highlighting percentage change instead of actual dollar amounts.⁴

⁴ For example, \$100 dollars does not hold much significance to someone that is making over a million dollars a year, however for someone living paycheck-to-paycheck, \$100 dollars can be extremely significant.

Summary Statistics.

Brooklyn Population	
GEA	48,348
Outside GEA	275,032

	Good English	Poor English
GEA	33,099	15,249
Outside GEA	197,190	77,842

	Immigrant	Native
GEA	16,274	32,074
Outside GEA	115,340	159,692

	Employed	Unemployed
GEA	22,227	26,121
Outside GEA	111,005	164,027

	Citizenship	Not Citizen
GEA	40,983	7,365
Outside GEA	229,684	45,348

	Minority	Caucasian
GEA	19,466	28,882
Outside GEA	154,228	120,804

House Hold Income	Average	SD
GEA	78,131.95	101,291.70
Outside GEA	67,821.42	75,648.82

Value of House	Average	SD
GEA	734,725.50	742,332.70
Outside GEA	507,291.50	440,194.80

Hourly Wage	Average	SD
GEA	23.49	37.21
Outside GEA	21.3	47.73

Rent Gross/Month	Average	SD
GEA	809.05	798.94
Outside GEA	574.43	631.64

Bedrooms	Average	SD
GEA	3.24	1.30
Outside GEA	3.42	1.47

Family Size	Average	SD
GEA	3.26	2.23
Outside GEA	3.49	2.12

The summary statistics generally align with the basic hypothesis that GEA areas are more affluent than non-GEA areas. Many of these variables will be used as controls in the regression that I will run so it is helpful to introduce them.⁵ The first column of the statistics is all dummy variables that I created in order to have a more general description of Brooklyn and GEA areas. I want to draw attention to the Household income statistics in the right column simply because that is the main focus of the regression that I will be using. There is a relatively large standard deviation with average household incomes in GEA spaces to be about \$10,000 dollars more than households in non-GEA spaces. The fact that from looking at the summary statistics, I can see that GEA spaces are clearly more highly valued, and more citizens live in them I can infer reasons for why this may be. This also further supports the assumption that the designation of a space as GEA may give it a greater possibility of having more affluent people live there.

⁵ Although these variables that I have generated as controls for the regression are not explanatory, they still serve an important purpose in leveling out the results. I want to take into account different angles and perspectives that could potentially have large effects on the Household Income – by accounting for these in the regression, I have a larger likelihood of getting statistically significant results.

Table 1 – Household Income

(1)	
VARIABLES	Effect on HouseHold Income in respect to Brooklyn GEA w/ Controls
brooklynGEA	5011.0327501*** (784.3175345)
GEA_After	1.14289e+04*** (1211.0890732)
minority	-2.23887e+04*** (368.3743057)
Immigrant	2379.7730369*** (424.6178243)
GoodEnglish	2.22593e+04*** (410.3111275)
2000	6880.6498095*** (664.5728566)
2005	1.00338e+04*** (537.5867836)
2006	1.42564e+04*** (608.8437174)
2007	1.82654e+04*** (652.9773500)
2008	1.72240e+04*** (659.1498753)
2009	1.55577e+04*** (643.8772336)
2010	1.56290e+04*** (619.2291815)
2011	1.74602e+04*** (595.0533019)
2012	2.48400e+04*** (707.0704935)
2013	2.77475e+04*** (700.1714159)
citizenship	6646.2524325*** (460.6050138)
famsize	3988.4246341*** (85.1337264)
Observations	310,501
R-squared	0.0578614

Notes: The instrument list is Brooklyn GEA designation at any point in time, Whether the PUMA was designated as GEA after 2008, Minority Status, Immigrant Status, English Proficiency, Family Size. standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Results.

In this section I will discuss the results of the regression run, shown in the table above. The covariates listed show the effect of the given variable in the form of a quantitative change on household income. The variables in the left column of the summary statistics are generated dummy variables. From the regression table above, I can see that in moving to spaces that were or are at one point designated in the Geographic Exclusion Area, from spaces that have not been designated under the GEA, we see that Household income increases by more than \$5,000 dollars with significance at the 99% level. This data simply reaffirms the previous hypotheses that areas designated under the Geographic Exclusion Area are more affluent. The question that remains is whether or not it was more affluent before or after the implementation of the GEA. It is very possible that because the amount of income that the area was receiving was so high, the policy that created the GEA was aimed at diversifying that space by at least 20 percent through the 80/20 program.

After running a regression of the effect on House Hold Income in respect to the Brooklyn GEA, I found that Household Income increases by \$5,011 dollars in moving from PUMA's not in the Brooklyn GEA at any point to PUMA's in the Brooklyn GEA. This does not necessarily account for the timing of the July 1, 2008 implementation of the Brooklyn GEA however it does shed light on the fact that wealthier households on average live in the Geographic Exclusion Areas. In the least, these numbers could provide evidence as to original reasoning for the NYCHUD to implement the GEA into these areas of Brooklyn – because they hold more desirable real estate. Furthermore, this regression controls for the fact that minority status, immigrant status, English ability,

citizenship and family size all play a role in how much household income can change. As we can see from Table 1, minorities make more than \$22,000 dollars less than Caucasians.

The year variables denotes the ACS census years that are used in the data and shows the development of Household income in relation to the base year of 2000. I have also gone through and accounted for inflation such that the incomes are relative to the last year of recorded data, 2013. The income information shows the difference between 2008-2009, the exact timing of the financial crisis. It is important to maintain the year variable in relation to the Household Income over time because it accounts for the financial crisis, the major event that would also be affecting income numbers other than the GEA status of a PUMA.

Table 2 – Hourly Wage

VARIABLES	(1)	(2)
	Effect on Hourly Wage with respect to Brooklyn GEA w/ Controls	Effect on Log Hourly Wage with respect to Brooklyn GEA w/ Controls
brooklynGEA	-0.5067519 (1.0229139)	-0.0142841 (0.0137213)
GEA_After	2.2419024** (1.0955939)	0.0089779 (0.0182772)
sex	-2.3182837*** (0.7947261)	-0.0188300*** (0.0063589)
age	1.2459713*** (0.0630930)	0.0578981*** (0.0013927)
agesquared	-0.0122537*** (0.0008042)	-0.0006054*** (0.0000166)
minority	-4.1786703*** (0.7004888)	-0.1377667*** (0.0067119)
Immigrant	-0.0843832 (1.4448280)	0.0157477* (0.0082775)
GoodEnglish	7.8644130*** (0.5690978)	0.3215225*** (0.0088538)
2000	6.5574543 (4.2323384)	0.0402387*** (0.0145722)
2005	1.2492484** (0.5929140)	0.0740482*** (0.0111493)
2006	1.6997896*** (0.3519824)	0.0755522*** (0.0116065)
2007	1.9160450*** (0.3395204)	0.1160194*** (0.0113591)
2008	1.7253947*** (0.3429749)	0.1074497*** (0.0120259)
2009	2.9453686*** (0.5922596)	0.1178578*** (0.0120346)
2010	2.0666638*** (0.3665971)	0.1148427*** (0.0121549)
2011	2.5860341*** (0.4441759)	0.1393905*** (0.0111770)
2012	4.2082576*** (0.4057788)	0.1822414*** (0.0113906)
2013	3.7990577*** (0.3869163)	0.1772315*** (0.0114488)
citizenship	4.9020352*** (1.1175685)	0.2675412*** (0.0096281)
famsize	-0.6666936** (0.2624085)	-0.0173793*** (0.0017011)
Observations	150,033	150,033
R-squared	0.0088388	0.0702865

*** p<0.01, ** p<0.05, * p<0.1

All of these factors help to characterize these community districts in Brooklyn and give us a better picture of exactly what types of people make up the neighborhood. The regression table describing the hourly wage, which we can see above, reaffirms the increase in wage and decline after the 2008 financial crisis. The first column in the table represents the affect on Hourly Wage that each of those variables contributes. The second column is the same affect however on the log of the hourly wage. This is important to show the contrast between the two because log hourly wage accounts for the difference in proportionality in income. By taking the log of the hourly wage, this change shows that difference and it is helpful to see the distinction between the two regressions. It is disappointing to see that by moving from PUMA's that are not GEA to PUMA's that have GEA status, the resulting change in Hourly Wage is negative and statistically insignificant. For the focus of this paper this regression is still important to understand but definitely not the result that I was looking for from the data.

These results are somewhat significant however in understanding these communities in Brooklyn. What could it possibly mean for the statistics to be significant before accounting for the natural log and then after, no longer holding any significance? One possible explanation could be that most of the income growth and gap was made at the top half of the income distribution. Basically, the super rich got richer – this could explain why when looking at the increase proportionally, the results no longer mean as much. Making \$5,000 dollars more means a lot more to a household making \$60,000 dollars as opposed to a household making \$200,000 dollars.

During my visit to Brooklyn Law School, I met with Professor David Reiss to talk about my thesis and the potential ways in which I can understand Brooklyn. Having spent

a lot of time in the area and raising his children there, Professor Reiss has colloquial knowledge of Brooklyn and told me of his perception of Bushwick and Middle Village. To paraphrase he noted that, “Bushwick was a relatively rough neighborhood growing up and has now gentrified to a place where many young urban professionals have started to settle. There was one instance when I was driving my son through Bushwick to Middle Village for a sports game – you could immediately tell when you crossed between the two because Bushwick is like a rapidly gentrifying movie scene of a city with small streets and Middle Village is more of a suburban feel. It doesn’t really feel like New York and there is far less population density.”

This conversation gave a lot of color to my understanding of the space and how an individual can perceive the stark changes in atmosphere by crossing a street. Furthermore seeing the space through the data, I will pick out some of the important points of the regression that are relevant to my question. From Table 2 we see that minorities make more than \$4 dollars less per hour than Caucasians. People that speak Good English make almost \$8 dollars more per hour and having citizenship in the United States allows an individual to make \$5 dollars more per hour. As I just mentioned, it is significant to note that the majority of these differences go away after taking the natural log of the hourly wage. It is still important to notice the differences in income between racial minorities and non-English speakers because these are the people that are being driven out of the neighborhoods. In fact, the difference between the GEA spaces before they were designated so and after shows a \$2.24 dollar increase in hourly wage. This means that after the space was designated as GEA, the hourly wage increased by \$2.24 dollars.

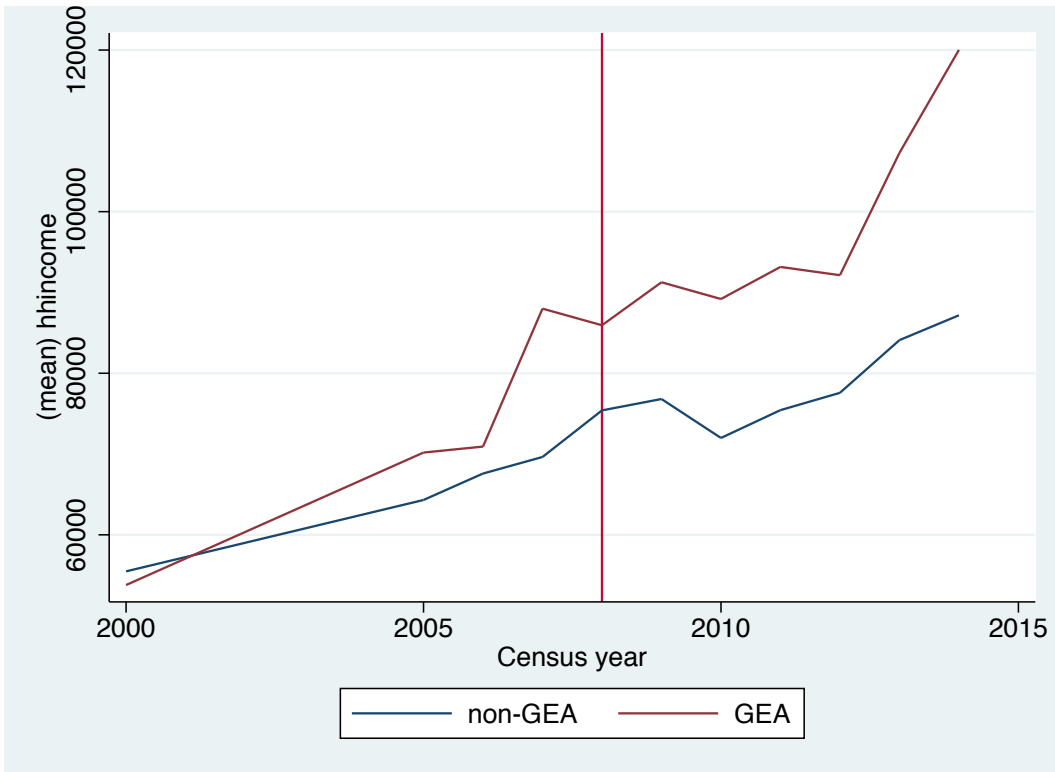


Figure 6 – Household Income

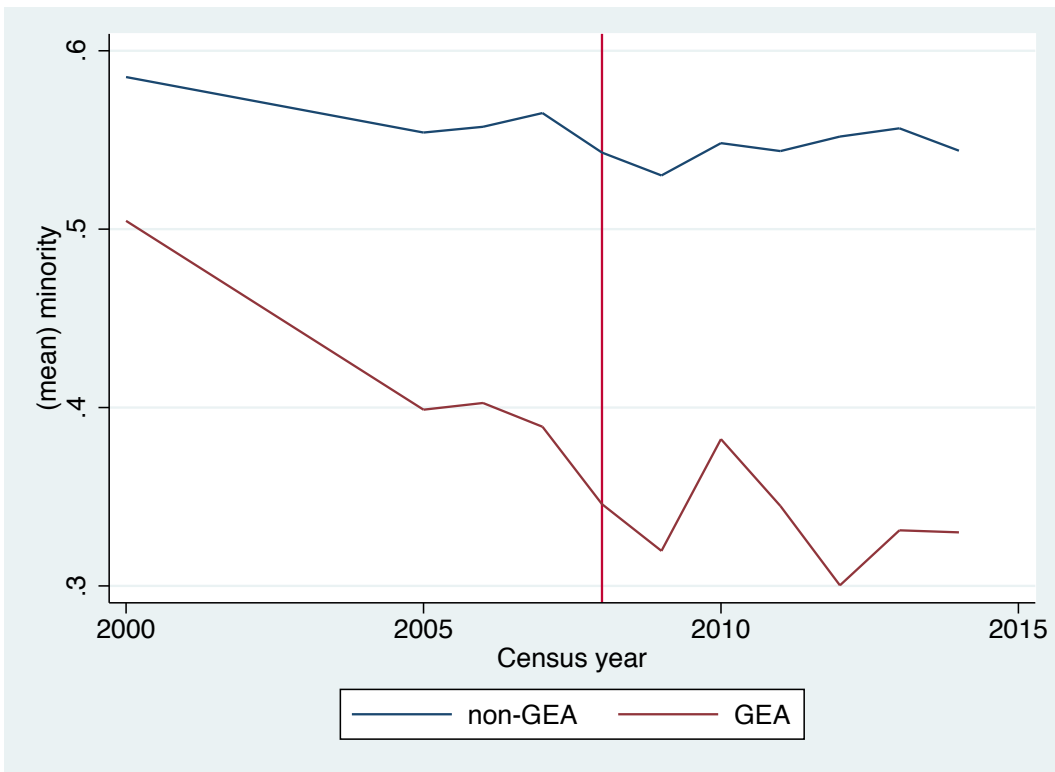


Figure 7 – Proportion of Minorities

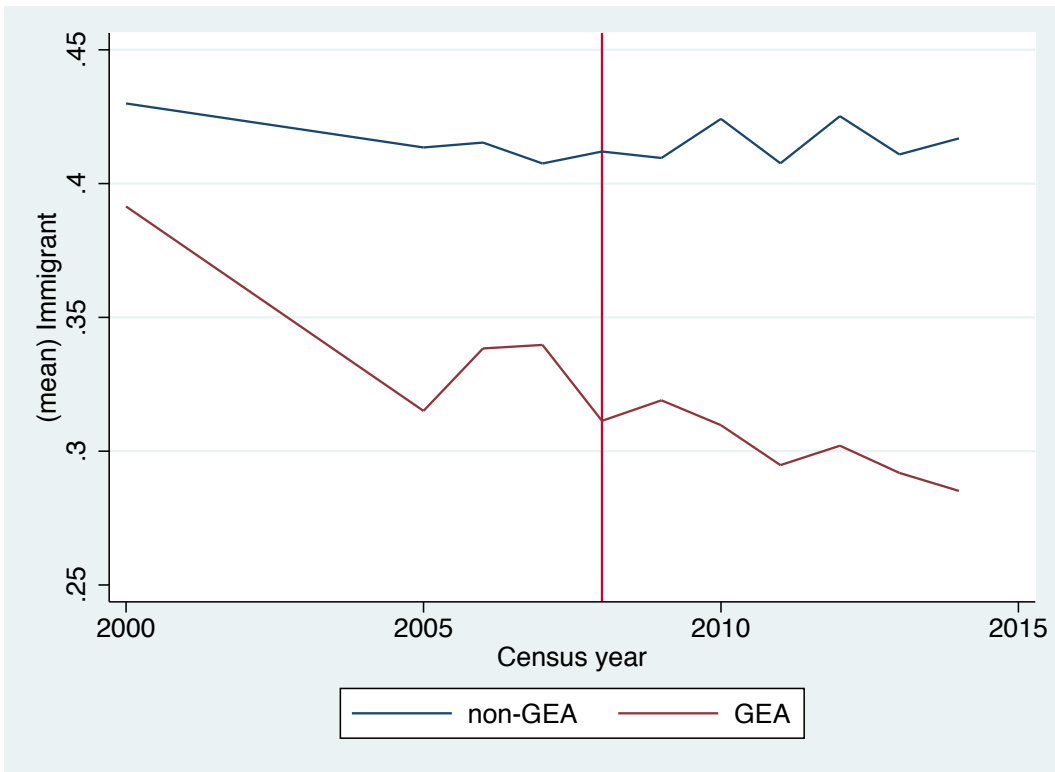


Figure 8 – Proportion of Immigrants

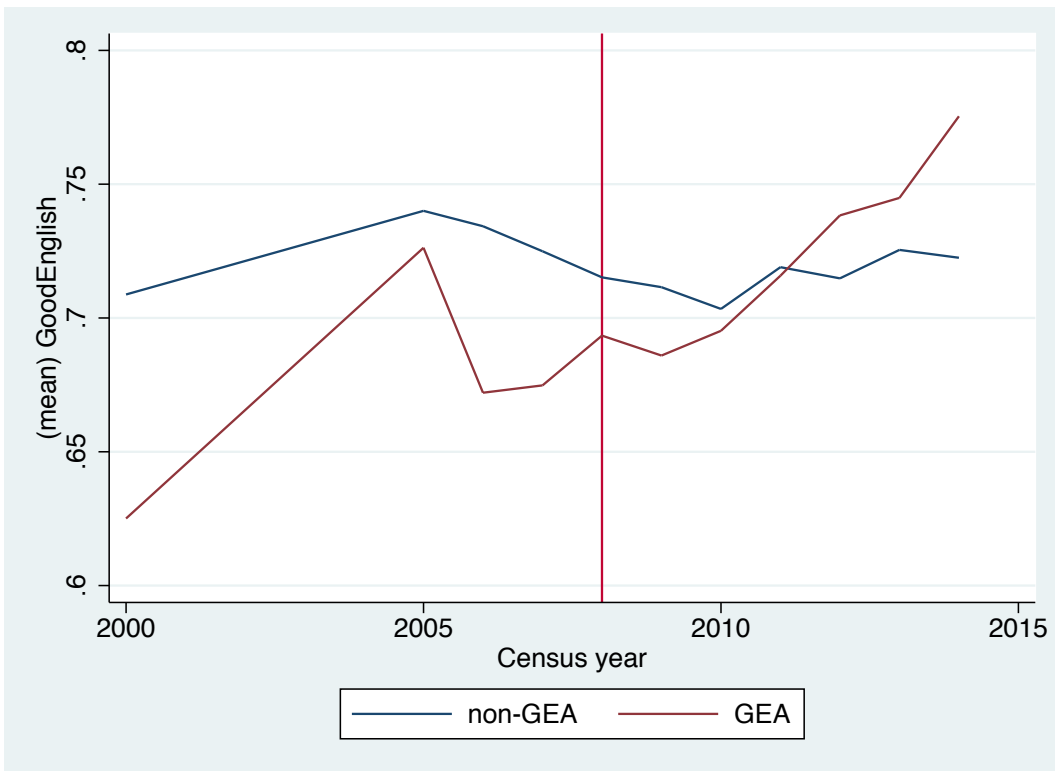


Figure 9 – Proportion of people speaking good English

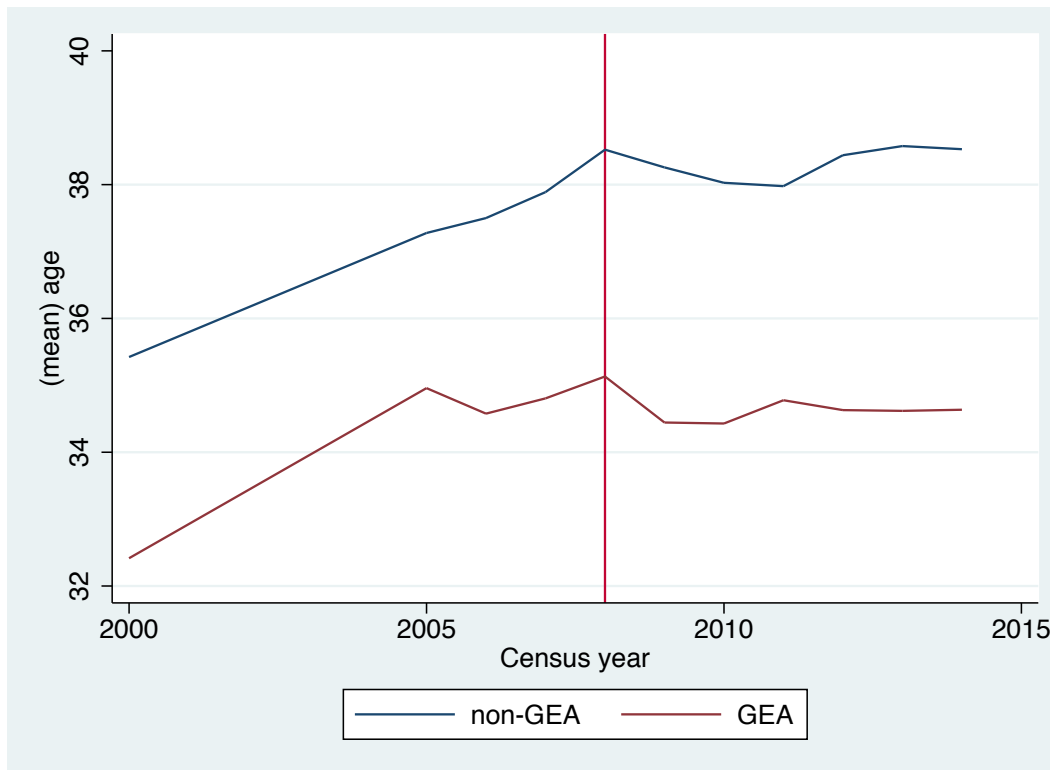


Figure 10 – Average Age

After establishing that there is a large gap between the incomes of the GEA spaces and the non-GEA spaces I create the difference-in-difference graphs, measuring the average household income adjusted for inflation first so I can see the difference between the GEA incomes and the Non-GEA incomes. In the household income graph we see that both incomes are trending at a relatively similar pace before the 421-a GEA treatment is implemented at the vertical red line in 2008. After the treatment is enacted, the lines slowly start to get wider and trend differently.⁶ This data gives the implication that the divergence of household income is at the least highly correlated with 421-a policy if not also containing a causal relationship. I have also included difference-in-

⁶ One large flaw in these graphs is the fact that there does not exist PUMA data for the years between 2000 and 2005. This means that we have to take the growth or decline of these variables between those times as constant; we see this clearly in the graphs where the difference is represented clearly as a straight line.

difference graphs for proportion of minorities, proportion of immigrants, proportion of people that speak good English, and the average overall age. These graphs use the data to help tell an interesting story about GEA implementation and the Brooklyn population.

After taking this into account, once the treatment is applied in 2008 there exists a slight bump in each of the graphs over time signifying that the affordable housing policy had some sort of positive effect. In the graph of the proportion of minorities for example, we can see in the GEA graph (red line) that the proportion of minorities in the Brooklyn GEA increases in around 2010. We also see a slight increase in proportion of minorities in about 2009. A possible narrative to summarize this data is that it is difficult to keep people in the neighborhood once you get them in with affordable housing. Even though a household can afford to live in the unit, policy still needs to account for other major areas of spending such as groceries, accessible public transport, and good public schools.

One point that I observed from the good English variable is that it increases in the GEA. I would expect from this increase that this statistic would coincide with proportionally fewer immigrants in the GEA, which we do observe from the immigrant graph. To formally conclude this analysis, I think that it is possible that the 421-a Tax Abatement Policy has a positive effect in the short term. It gives lower income households the ability to rent in neighborhoods that are disproportionately more expensive. What the policy fails to account for which I suppose no single policy could do, is also to help these households with other major expenditures and considerations. People choose to live in places for very specific reasons and yes - rent is a very important one. But access to a grocery store that has affordable prices is another large monthly expenditure that may not be available if the rental unit is in an expensive neighborhood.

Furthermore, it might be difficult to have access to good public schools and consistent public transportation. Although the 421-a Tax Abatement Policy was created in efforts to increase diversity while stimulating affordable housing development, I think that ultimately the data is telling me that at best, this policy must work in conjunction with other public policies.

Future Policy Recommendations

The data shows that there is a definite increase in wage as we move from looking at a space that is not designated as GEA to one that is. In both regressions on Household income and hourly wage, we were able to see distinct differences in wage when looking at minorities, English speakers, and citizens. This reaffirms the notion that GEA spaces simply hold more valuable real estate. The city sees the designation as an opportunity to create larger amounts of affordable housing within the city while still be able to incentivize its creation through policy. Most studies find that tax abatement policies such as 421-a are largely ineffective in achieving their goals. After going through this data and learning more about the policies themselves I think that I can understand why. It is not simple enough to create policy to incentivize change through the market. The policies had to be designed such that developers would still be incentivized to use them – in other words, the developers would still make some sort of profit after going through the arduous process of actually developing real estate. Many people would argue that the profit margins on some of these real estate properties are unjustifiable and that the policies should tighten the profit margins. I think that there may be an alternate reasoning for the large profit margins of some of these developments. Real Estate Development is a lot of stress and hard work. During my time at The Continuum Company, I realized the amount of pressure and loss of sleep that the project could bring to project managers. These projects are run at a high anxiety level and need constant attention day to day. Because of this it is possible that developers may not be willing to develop at lower profit margins. In conclusion I think that one of the major reasons for the general ineffectiveness of government policies such as 421-a, is that the attempt to manipulate

market incentives is simply not strong enough to effectuate a substantial change in community. It seems clear from this data that after the implementation of the GEA and incentives given to utilize the 421-a tax abatement program, income increased in GEA spaces at a larger rate than non-GEA. In addition, the regression results support that notion that the Brooklyn GEA is less diverse and inclusive. There are fewer minorities in the spaces as well as fewer people that speak good English. It appears that although the policy aims to create a more inclusive community, the data shows that over time the Brooklyn GEA is increasingly whiter and contains higher incomes on average.

The findings of this paper are based on the major assumption that GEA designation of a space changes the attitude that people have towards it and therefore effectuates change in the space itself. An important question to be verified is whether or not the GEA name changes people's perception. From the difference-in-difference graph, we also found saw that it appeared most of the deviation in trend between GEA and non-GEA spaces happened before 2008. Additional research on whether information was released in the news about the future policy of changing the GEA in Brooklyn in 2007 would support the early deviation. Lastly, an interesting and important missing piece of analysis would be to look at other major policies working in conjunction with 421-a. As I was interested specifically in the history of this one affordable housing policy, I am only able to show a correlation between its implementation and the data – obviously there is no way to prove that this is a causal relationship. Furthermore although the data shows results that would not support the further implementation of this policy, it has the potential to achieve its goals if other similar and supporting policies are put in place.

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