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On The Effects of The Butler County Land Bank's Blight Removal Program

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Project Origination

In 2015, members of the Board of Directors of the Butler County Land Bank (officially the Butler County Land Reutilization Corporation) became interested in conducting a study to measure the impact of the Butler County Land Bank where it has been utilized. The Executive Director of the Land Bank was contacted by Miami University faculty from the Center for Analytic and Data Science as well as the Center for Public Management and Regional Affairs. These Miami University entities partnered in order to facilitate a quality analysis of the effects of the Butler county Land Bank.

Background

In 2008, the Ohio General Assembly passed legislation allowing for the creation of Ohio's first land bank in Cuyahoga County. In 2010, additional legislation expanded the opportunity for the creation of land banks in Ohio's 42 most populous counties.

In June 2012, Commissioners in Butler County passed a resolution to allow for the incorporation of Butler County's Land Bank led by the efforts of Butler County Treasurer Nancy Nix. The limited purpose of the Butler County Land Bank in 2012 was to act as the Lead Entity to apply for funds from the Ohio Attorney General's Moving Ohio forward blight elimination grant.

The creation of the Land Bank resulted in the cities of Middletown and Hamilton each signing a Memorandum of Understanding (MOU) with the Land Bank to seek the Moving Ohio Forward Funds. \$2.7 million dollars was awarded through this grant to Butler County (\$2.2 million of which was matching funds for demolition). Through the Moving Ohio Forward grant and matching funds from the cities, Butler County used \$4,613,568.30 to remove 511 separately addressed units in Middletown and Hamilton.

During the period between June 2012 and October 2014, the Land Bank was not funded through Butler County. Land Banks can be funded by up to 5% of Delinquent Tax Assessment Collections (DTAC) from the County Treasurer's annual property tax collections. Many Ohio land banks are funded at this 5% DTAC level. Butler County was unfunded meaning no DTAC income supported the operations of the land bank. Matching funds were provided directly by each city. The operations of the Butler County Land Bank were based in the County Treasurer's office with existing staff.

The function of the Butler County Land Bank was merely to act as a conduit for grant funds from other entities for the purpose of blight elimination. The Board of the Land Bank chose not to hold long-term title to properties, so any property acquisition through the Land Bank was executed as a conduit transaction meaning the city wishing to take ownership of properties did so through simultaneous transfer from the owner (or forfeit land list), to the Land Bank, and then to the city. The city of Hamilton was the sole acquirer of property through 2014. Middletown used funds to demolish blighted properties, but the city never took ownership opting instead to place a lien on the property.

In 2014, the Butler County Land Bank applied for funds from the Ohio Housing Finance Agency's Hardest Hit Funds initiative. This is a blight elimination program that also involves the U.S. Department of Treasury. The requirements of this program include the necessity of the Land Bank to take ownership of the property (through the MOU, anything the Land Bank takes

title to will eventually transfer to the city). Therefore, Middletown began to acquire properties through the Land Bank beginning in 2015.

In 2014, Butler County Commissioners agreed to fund the Butler County Land Bank with DTAC funds. However, instead of fully funding at the 5% DTAC rate, Commissioners opted to fund at 1% DTAC. This results in an estimated \$130,000 per year (full funding at 5% would yield approximately \$650-\$750,000 per year). The Commissioners placed a three year sunset on this funding in order to have time to gather information and evaluate if the Land Bank is an entity they wish to continue funding beyond 2017 or to fund at a different level.

The original goal was to utilize this new DTAC funding outside the cities of Hamilton and Middletown despite the fact that no other local governments in Butler County had engaged in MOUs with the Land Bank. In April 2015, Ross Township executed an MOU with the Land Bank as did the City of Trenton. In May 2015, Fairfield Township passed a resolution to engage with the Land Bank. As of May 2016, the following communities have executed a MOU with the Butler County Land Bank:

- City of Hamilton
- City of Middletown
- City of Trenton
- Fairfield Township
- Hanover Township
- Liberty Township
- Madison Township
- Oxford Township
- Ross Township
- Wayne Township

Because of the increased demands of the Land Bank, the Butler County Treasurer, who had been the President and Chairman of the Land Bank since June 2012, requested that the Commissioners dedicate an employee to the Land Bank. The Commissioners created a new position in the Department of Development of “Development Administrator” and hired the Chief Deputy of the Butler County Treasurer’s office to that position. In April 2015, the Land Bank Board appointed Michael McNamara, the new Development Administrator, as the President of the Land Bank.

In addition to being President of the Land Bank, McNamara also serves as Executive Director of the Butler County Port Authority and works as a member of the County’s development team in the Department of Development. His duties are divided by the Land Bank, Port Authority and Department of Development. He is officially a County employee who is working with the two quasi-governmental agencies through a MOU between each agency and the Butler County Commissioners.

Scope

The original scope of the study was to assess the effects of blight elimination conducted by the Butler County Land Bank. Since the City of Hamilton and the City of Middletown have taken different approaches regarding blight (the City of Hamilton actively seeks to place properties back into the stream of commerce while Middletown has chosen a less hands-on approach), results are provided collectively as well as segregated by city. The Miami University team set out to gather a wide array of data from multiple sources in order to determine what data is most pertinent and measurable.

Executive Summary

The executive summary provides a high-level overview of each aspect of the project. Additional detail can be found in the corresponding sections below in the full paper.

Compiling of Data

The datasets used throughout the entirety of this project were collected in cooperation with a number of different governmental organizations within Butler County including:

- Butler County Auditor
- Butler County Clerk of Courts
- Butler County Coroner
- Butler County Treasurer
- City of Hamilton Health Department
- City of Hamilton Police Department
- City of Hamilton Community Development Department
- City of Middletown Department of Public Safety
- City of Hamilton Health Department
- City of Hamilton Community Development Department

Data Cleaning

In order to prepare the data for use in the database, GIS map and economic analysis, it required “cleaning” or standardization among the various different sources. Measures taken to clean and process the data included standardizing abbreviations, merging files, removing duplicates, splitting address fields and correcting typographical errors. Cleaning and processing the data took approximately 150 man hours.

Database Construction

Once the data was cleaned, it was loaded into a database running on MySQL. The database serves as a central location for the data used throughout the project. By using MySQL, the database can be installed for free and data can be easily retrieved from the database for future use. The database construction took approximately 15 man hours to complete.

Geographic Information Systems

The data was assigned geographic coordinates to allow visual representation on a map as well as aid in the exploration of the spatial relationships between the various collected data points and the blight removal activities within Hamilton and Middletown. The GIS data processing, geocoding and analysis required approximately 150 man hours.

Interactive Application

The interactive web application was developed using HTML, CSS, JavaScript, and the ArcGIS API. It allows a user to interactively select layers of data and visualize them on the map. Development of this application took approximately 70 man hours.

Economic Analysis

In our secondary data analysis, we used least squares and logistic regression to analyze the impact of blight removal on housing values and the incidence of foreclosure. The results

suggest blight removal may be associated with higher housing values and lower incidences of foreclosure. This analysis required approximately 80 man hours.

Recommendations

In order to conduct further analyses regarding the effectiveness of the Land Bank, the project team would suggest that each department within the county adopt shared data recording and storage methodologies. This level of standardization would significantly ease any efforts to collect and analyze data by ensuring that each organization uses a standardized set of addresses and Parcel ID numbers. Using shared data recording and storage will likely reduce human error that occurs when multiple agencies are creating multiple records for the same parcel, court case, or individual.

Utility of the Land Bank

Economic Protection and Revitalization

Land banks across Ohio are utilizing extensive funding mechanisms to remove blight, which suppresses economic recovery, garnering attention from both city leaders and state officials. Ohio was hit particularly hard by the recent recession and the decline in the manufacturing sector, which gives rise to the rate of foreclosures. The Federal Reserve Board of Cleveland has stated “Foreclosures are tremendously costly to the neighborhoods in which they concentrate, and their impact is long lasting. Spillover costs, which mushroom as houses remain vacant, are borne by neighbors, local government, and philanthropic organizations” (Facing the Foreclosure Crisis, 2010). Larger cities such as Hamilton and Middletown are especially susceptible to these effects. Land banks have become instruments to alleviate the negative economic spillover that comes from having abandoned houses in a neighborhood. The Butler County Land Bank, operating from the generous funding Ohio has received from the Hardest Hit Fund, joins Counties across Ohio with high levels of blighted structures that have created land banks to assist their cities’ crises. The Butler County Land Bank has already spent \$7 million in local, state, and federal funds to demolish over 600 blighted structures (Callahan, 2016). Overall, Ohio has received a total of \$80 million from federal funds, and only counties operating incorporated land banks can utilize these funds (Balusik, 2016).

Blight and Pollutants

Pollutants stemming from dwellings are a vital concern for leaders in Hamilton, Middletown and the Land Bank. Harm from pollutants such as lead and asbestos pose significant community health risks, as well as an issue with public health equity given that many of the dilapidated structures with which the land bank engages come from low income areas. The presence of lead and asbestos related hazards can indicate that a structure was not well maintained and presents a wide array of health threats to its occupants. One of the risks to be mitigated from improved housing is lead poisoning, which can be harmful to all occupants in a house, but more so with children growing up in a lead tainted housing complex (Jacobs et al., 2009). Along these same lines, lead or asbestos tainted structures are a danger to the neighborhoods where they reside, and residents in and around these structures are at risk. A survey conducted by the city of Hamilton between 1990 and 1994 reported major lead poisoning cases in low-income neighborhoods and several national studies have come to the conclusion that 35% of homes located in low income areas have recorded positive signs of lead contamination (City of Hamilton, 2016 & Jacobs et al., 2009). The Land Bank has the capability to target houses harboring these and other potential health hazards in its effort to staunch the

negative repercussions stemming from abandoned properties. Given the evidence within Hamilton and Middletown, and the generally understood risks of these toxic substances, the removal of these buildings by the Land Bank will present an opportunity to reduce and eliminate certain health hazards impacting the community as a whole.

Origins of the Project Data

The data that was used in this project was collected over a three week period where a team member served as an intern at the Butler County Land Bank. This team member solicited the necessary data from the Butler County Treasurer, Auditor and Coroner, as well as the Police and Fire departments in the cities of Hamilton and Middletown. Gathering this information took approximately 36 man hours of the 120 hours spent at the internship. Additionally, during the course of the rest of the project, numerous questions regarding the format of the data, missing information, and additional data needs generated an additional 8 man hours of work in contacting and working with these governmental organizations to answer such questions and retrieve the needed information. The compiling of data in total took 44 man hours.

- The office of the Butler County Auditor provided detailed documents on assessed property values and house addresses for the entire county.
- The office of the Butler County Treasurer provided information about tax delinquent properties throughout the county and assisted in providing data on the demolished properties throughout the region.
- The office of the Butler County Clerk of Courts provided data on the locations of foreclosed properties within the county (data was publicly accessible through the Clerk of Courts website).
- The Butler County Land Bank provided the addresses and information regarding buildings demolished as part of the Land Bank program.
- The office of the Butler County Coroner provided data regarding the number and location of deaths due to drug overdoses in the county.
- The City of Hamilton Police, Fire and Emergency Medical Services provided information regarding the locations of calls for emergency services as well as data on which calls were related to drug crimes or injuries.
- The City of Middletown Police, Fire and Emergency Medical Services provided information regarding the locations of calls for emergency services as well as data on which calls were related to drug crimes or injuries, as well as GIS map data for these locations.

The project team would like to extend our appreciation to these organizations and their incredible staff for making this project possible.

Data Cleaning

Once the data was obtained, the cleaning process began. The purpose of cleaning, standardizing and processing data is to better prepare the data for implementation into a database, enable accurate and meaningful statistical analysis and determine quality-based limitations in terms of analysis. Data cleaning is a crucial aspect of any data related project, as nothing can be done until the data is in a usable form. For the Land Bank project, the data cleaning process took an estimated 150 man hours. The points below will summarize the cleaning actions performed on each dataset we received.

- Demolition data for both Hamilton and Middletown was cleaned by standardizing address abbreviations, adding street suffixes, correcting typographical entry errors, merging addresses and demo dates and removing duplicates.
- Tax delinquency data for both Hamilton and Middletown was cleaned by removing the dashes from the Parcel ID field and filtering the dataset to only include records for Hamilton and Middletown as distinguished by the beginning of the Parcel ID number.
- Coroner data for both Hamilton and Middletown was cleaned by dropping observations with missing values, removing duplicate records, splitting addresses into street, city, state and zip code, standardizing abbreviations and changing intersections to the first full address that returned a Parcel ID number.
- Foreclosure data for both Hamilton and Middletown was cleaned by filtering to only include Hamilton and Middletown, splitting addresses into street, city, state and zip code, standardizing abbreviations and changing ranges of house numbers to the lowest one that returned a Parcel ID number.
- Hamilton police and fire data was cleaned by standardizing address abbreviations and merging the file with the parcels data to return a Parcel ID number.
- Middletown police and fire data was cleaned by removing special characters from addresses, standardizing address abbreviations and merging the file with the parcels data to return a Parcel ID number.

Database Construction

After all of the data was collect and cleaned, it was compiled into a database. The purpose of the database is to serve as a centralized location for the variety of data used throughout the project. We used my MySQL to create the database because it is a free and open source tool that anyone can download and access. While it was initially our hope to create relationships between the datasets within the database, it was not possible due to the inconsistency of record-keeping systems across the departments from which the data was obtained. The database allows for queries to retrieve a subset of information. The results can be used for a variety of purposes, such as looking at a specific event, or doing economic analysis.

The database construction took approximately 15 man hours to complete.

Several deliverables were created in the database construction process, including:

- An instruction manual for installing MySQL on a computer and setting it up to handle the database is available upon request.
- A SQL dump of the database. This is used to create a replica of the database as we created it. It is loaded into MySQL during the installation process. Due to the size of the file, it is being delivered via flash drive.
- A list of pre-written queries have been provided to the project sponsor. These can be copied and pasted to easily retrieve data from the database. In addition, anyone with minimal knowledge of SQL can create additional queries.

Geographic Information Systems

The GIS work on this project was a dynamic process which initially began as an attempt to take GIS data from the county and spatially join the various data sets gathered by using the Parcel ID number. This technique proved to be problematic due to incomplete or missing Parcel ID numbers, as well as the size limitations for displaying the data in the interactive web application map. The focus then became to actually geocode the data by adding geographic

coordinates to the data sets, allowing for the data to be displayed on a map. Geocoding and spatial analysis (including buffers for economic study) was accomplished using ArcMap software as well as Geocode by Awesome Table, a free tool for the Google Sheets that uses a Google Maps API to generate longitude and latitude coordinates for the data tables.

Interactive Web Application

The interactive web application allows a user to select different layers of data and view them on a map. The data is plotted as points based on latitude and longitude. For example, a user may visualize all of the tax delinquencies in Hamilton in 2013, and overlay this with the foreclosures in Hamilton in 2014. Any such combination is allowed by the app. This app is built upon the ArcGIS JavaScript API and utilizes HTML, CSS, and JavaScript. There were some limitations encountered, mainly the API's inability to process large data files. As a result, we decided to forego visualizing Police data. The size of the data was such that the application's performance suffered significant degradation.

Economic Analysis

In this analysis, we examine the potential effects of the Land Bank blight removal program in Hamilton and Middletown with regard to housing values and the incidence of foreclosure. Our primary research questions are as follows:

RI: What is the effect of blight removal on housing values in Hamilton and Middletown over the years 2013-2015?

RII: What is the effect of blight removal on the incidence of foreclosure in Hamilton and Middletown over the years 2013-2015?

We begin by describing the data and variables used in the analysis. This is followed by a discussion of the summary statistics by our two groups: the treatment group (within 500 feet of a demolition) and the comparison group (all other houses in Hamilton and Middletown). Next we discuss the results of our study of RI and RII and conclude with recommendations for further analysis.

Data Sources. We received data from various departments within the cities of Hamilton and Middletown as well as Butler County (see "Origins of the Project Data"). For both of our research questions, the primary dataset was provided by the Butler County GIS Auditor. We will refer to this dataset as our Auditor data. The document contained parcel-level data on key housing characteristics including assessed value, acreage, square footage, and neighborhood. While the data included years 2007-2015, our conclusions are limited to 2013-2015. We omitted the data from 2007-2009 from our analysis to remove the immediate effects of the economic recession on our results. We used the data from 2010-2012 for initial investigation of the data, and we base our conclusions on the data from 2013-2015. We limited the sample to parcels in Hamilton and Middletown which were classified as residential as the blight removal program has focused on residential blight in these two cities.

In addition to the data from the Butler County GIS Auditor, we obtained foreclosure information from the Butler County Clerk of Courts website to address RII. We limited this data to only parcels in Hamilton and Middletown and excluded 168 cases with missing Parcel IDs.

We merged the two data sets (Auditor data and foreclosure data) by Parcel ID and year. Several cases (370) did not match by either Parcel ID, year, or both. These observations were excluded from the analysis.

Key Analysis Variables. The variables used in the analysis are listed in Table 1 with a description, example where applicable, as well as the source of the data.

TABLE 1: VARIABLES USED IN ANALYSIS

<i>Variable</i>	<i>Description</i>	<i>Example (if applicable)</i>	<i>Source</i>
Proximity to demolition (demolition indicator variable)	Categorical variable to control for proximity to demolition i.e. "treatment"	Example: demo500f = 1 if observation is within 500sqft of demolition and year is within treatment period (2013, 2014, 2015), 0 otherwise	Created by analyst
Hamilton indicator variable	Dichotomous variable to indicate whether an observation is in Hamilton or Middletown	Example: hmt = 1 observation is in Hamilton, 0 if otherwise (indicating observation is in Middletown)	Created by analyst
Stories	Number of stories in the house		GIS Auditor "Parcels Current"
Acres	Total amount of acres included in the entire property as stated in the deed		GIS Auditor "Parcels Current"
Age	Current age of property in years (2016-year the house was built)		GIS Auditor "Parcels Current"
Floor space	Square footage of the house		GIS Auditor "Parcels Current"
Year indicator variables	Dichotomous variable for each year in the sample	Example: year10 = 1 if year = 2010, 0 otherwise	Created to control for year trends
Neighborhood indicator variables	Dichotomous variable for each neighborhood in the sample	Example: nbhd2 = 1 if neighborhood = 2, 0 otherwise	Created to control for trends by neighborhood
Value	Total appraised value based upon comparable home sales within a certain time frame		GIS Auditor "Parcels Current"
Log value	Natural log of housing value used as dependent variable in RI analysis; allows for interpretation of results as percentage changes		Created by analyst
Incidence of Foreclosure (indicator variable)	Dichotomous variable used to indicate if the parcel is listed in foreclosure in the given year; dependent variable in RII analysis	Example: forec = 1 if parcel listed in foreclosure in observation year, 0 otherwise	Created by analyst using data from Butler County Clerk of Courts website

Note: Neighborhood code is specified in GIS Auditor "Parcels Current" as defining "geographical area exhibiting a high degree of homogeneity in amenities, land use, economic trends, and housing characteristics such as structural quality, age, and condition. The neighborhood code dramatically affects the value of the property."

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Neighborhood indicator variables	Dichotomous variable for each neighborhood in the sample	Example: nbhd2 = 1 if neighborhood = 2, 0 otherwise	Created to control for trends by neighborhood GIS Auditor "Parcels Current"
Value	Total appraised value based upon comparable home sales within a certain time frame		Created by analyst
Log value	Natural log of housing value used as dependent variable in RI analysis; allows for interpretation of results as percentage changes		Created by analyst
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Note: Neighborhood code is specified in GIS Auditor "Parcels Current" as defining "geographical area exhibiting a high degree of homogeneity in amenities, land use, economic trends, and housing characteristics such as structural quality, age, and condition. The neighborhood code dramatically affects the value of the property."

The key variable in the analysis is the dichotomous “proximity” variable. Proximity is defined as being within a 500 foot radius of a demolition. A 500 foot radius includes properties within approximately 1-2 city blocks of a demolition. In each model presented, this proximity variable takes on a value of 1 for all observations within the radius in the years 2013- 2015 (the treatment period) and a value of 0 otherwise. Hence we will use this variable to estimate the “treatment” of blight removal on properties surrounding a demolition.

Comparison of Proximal/Non-proximal Properties 2010-2012. Table 2 reports the means and standard deviations of various housing characteristics over the years 2010-2012. The first column reports these statistics for homes that are within a 500 foot radius of a demolished property for the 2010-2012 time period. Because the majority of homes removed in 2010-2012 were demolished prior to the establishment of the Land Bank, we include this summary information to simply illustrate the differences in the properties that are within a close proximity of a demolished property. On average, homes within a 500 ft radius of a removed property in 2010-2012 are less expensive, with smaller lots, less floor space, and older. It is evident that the two groups were fundamentally different before blight removal began, and so we must control for these extraneous factors (lot size, floor space, age, and neighborhood) in our analysis.

TABLE 2- SUMMARY STATISTICS BY TREATMENT AND COMPARISON GROUPS
2010-2012

	Within Radius (<i>n</i> = 47325)	Outside Radius (<i>n</i> = 77607)	T-stat for Equal Means
Housing characteristics:			
Mean value (\$)	47040.33 (26536.25)	91068.06 (53194.27)	167.78***
Mean lot size (acres)	0.7574 (2.52)	2.0075 (3.68)	6.40***
Mean interior floor space (sqft)	1236.18 (498.94)	1429.78 (602.77)	54.27***
Mean building age (years)	91.38 (24.98)	57.66 (25.23)	-210.00***
Mean stories	1.43 (0.48)	1.25 (0.42)	-65.26***

Notes: Radius is measured as 500 square feet from a demolished parcel. Reported statistics are measured for years 2010-2012 to evaluate "pre-treatment" trends. Statistical significance of the t-tests are indicated by * for $p < .1$, ** for $p < .05$, and *** for $p < .01$.

RI: Housing Values. Table 3 reports the least-squares regression results. The dichotomous proximity variable indicates blight removal as described above, and the natural log of housing value is used as the dependent variable. Due to the differences in how Hamilton and Middletown handled the blight removal, we believe there may be a differential effect of removal on housing values that is due to the city. Thus, we conduct separate analyses on data from the two cities.

In the model for Hamilton home values, the coefficient on the proximity variable is 0.2965 ($p < .01$). This implies that blight removal in Hamilton is associated with, on average, 29.65% higher housing values for comparable properties in terms of age, size, lot size, neighborhood, and year of value assessment. The model for Middletown home values suggests a statistically insignificant relationship between blight removal and housing values.

TABLE 3: ANALYSIS OF HOUSING VALUES
Dependent variable: Log Housing Values

	Ordinary Least Squares (OLS) Analysis of Hamilton Housing Values	Ordinary Least Squares (OLS) Analysis of Middletown Housing Values
Proximity to demolition (dichotomous variable)	0.2965*** (0.0756)	-0.057 (0.0371)
Hamilton dichotomous variable	-	-
Stories	0.1113*** (0.0284)	0.0157 (0.0346)
Acres	0.0422*** (0.0047)	0.0825*** (0.0093)
Age (years)	-0.0045*** (0.0004)	-0.0031*** (0.0005)
Floor space (sqft)	0.0002*** (0.0000)	0.0002*** (0.0000)
Year indicator variables included	Yes	Yes
Neighborhood indicator variables included	Yes	Yes
R-Squared	0.8875	0.8288
Number of Observations	834	1143
Number of Groups		

Notes: Results are given for 2013-2015. Standard errors of the coefficients are given in parentheses. Statistical significance is indicated by * for $p < 0.1$, ** for $p < 0.05$ and *** for $p < 0.01$.

Foreclosures. To address RII, we analyze the relationship between the incidence of foreclosure and proximity to a blight removal area. As we did our analysis of housing values, we use the dichotomous proximity variable to indicate blight removal. The dependent variable is dichotomous as well: 1 if the observation is in foreclosure in the given year and 0 otherwise. Because the outcome variable is dichotomous, we use logistic regression analysis to model foreclosures. As we did in our RI analysis, we investigate the possibility of a differential treatment effect of blight removal on foreclosures in Hamilton versus Middletown by fitting separate models for observations in each city. The model for Hamilton indicates no significant relationship between blight removal and foreclosures. Interestingly, in Middletown, there is a strong association between blight removal and foreclosures such that proximity to a demolished property is associated with a significant reduction in the likelihood of foreclosure when comparing similar properties (according to age, size, lot size, year, and neighborhood).

Results of our analysis for the city of Middletown are given in Table 4. The coefficient of the proximity variable is -0.0981 ($p < .01$) which indicates that proximity (within a 500 foot

radius) to demolished properties is associated with a 9.81% decrease in the likelihood of foreclosure when comparing similar properties (age, size, lot size, year, and neighborhood). Our analysis provides evidence that blight removal may have led to lower likelihood of foreclosure in Middletown during the treatment period. A similar relationship between foreclosure and blight removal could not be found for the city of Hamilton.

TABLE 4: ANALYSIS OF FORECLOSURES
Dependent variable: Incidence of Foreclosure

Logistic Regression (Logit)	
<i>Marginal effects</i>	
<i>Cities included in sample</i>	<i>Middletown</i>
Proximity to demolition (dichotomous variable)	-0.0981*** (0.0324)
Hamilton dichotomous variable	-
Stories	0.00671 (0.00561)
Acres	0.0006 (0.0009)
Age (years)	-0.0001 (0.0001)
Floor space (sqft)	-0.0000 (0.0000)
Year indicator variables included	Yes
Neighborhood indicator variables included	Yes
Pseudo R-squared	0.1017
Number of Observations	537

Notes: Results are given for 2013-2015. Standard errors of the coefficients are given in parentheses. Statistical significance is indicated by * for p<0.1, ** for p<0.05 and *** for p<0.01.

Recommendations

Blight removal in Hamilton and Middletown has been an ongoing process since 2013, and this analysis investigates the possibility of spillover effects in the surrounding areas. We find evidence suggesting blight removal is positively correlated with housing values and negatively correlated with the incidence of foreclosure in Hamilton and Middletown. The results also imply that there could be a differential impact of blight removal on housing values in Hamilton compared to Middletown.

As the Land Bank's blight removal program has continued through 2015, and our analysis has occurred in the first half of 2016, we recommend this analysis be replicated with additional years of data. Doing so will allow for the possibility of any delayed impacts of blight removal, should they exist. To do this, we recommend that data collection continues beyond the

completion of this project. All data files collected throughout this project have been provided to the project sponsor.

Throughout the development of this project, the vast majority of work hours have been devoted to reconciling the data formats of the various organizations that provided information. Unfortunately, as is described in the Limitations section, several of these differences required manual editing of the data and even with nearly 150 hours devoted to the task, many of the addresses and Parcel ID numbers from the datasets did not correspond to any other address or Parcel ID from the data provided by other organizations.

In order to facilitate a more in-depth study on both the topic of the Land Bank as well as any other data-driven research project in the future, that Butler County, the City of Hamilton, the City of Middletown and other local governments in the county each consider adopting a shared data recording and storage methodology between all of the departments in each organization. This sort of standardization would significantly ease any efforts to collect data by ensuring that each organization uses a standardized set of addresses and Parcel ID numbers, which was the main limiting factor on our analysis. Additionally, the detailed collection of data will allow for more accurate progress measures for governmental organizations and can help improve accountability to constituents as well as help identify in detail where funding is being allocated to facilitate additional efficiencies and savings.

Additionally, the project team would strongly recommend that a continued effort be put into maintaining and updating the database deliverable with new information as it becomes available. While the team's conclusions have been limited by the relatively small number of years over which they could observe the effects of the land bank, every year of additional information will improve the accuracy of the database queries and provide better and more informative results without the need to dig back through several years of data when a study similar to this one needs to be run again.

Limitations

Several factors contributed to limitations in terms of analysis. The first limitation was time. Due to the immense amount of time spent cleaning the data, there was not ample time to perform multiple analyses and still meet the deadline. Additionally, we did not have enough data points over time to find statistically significant results in statistical and economic analysis. Another factor was data consistency. The poor data consistency due to non-standard data collection practices throughout Butler County prevented us from merging files to tie in desired information. The recurring issue with data consistency was being able to effectively match Parcel ID numbers. For example, using the address in the police and fire files and the address in the master parcels document obtained from the GIS auditor to pull in Parcel ID numbers only yielded a 50% match rate for Parcel ID numbers. The inability to match Parcel ID numbers was so detrimental to the project because Parcel ID was often the only common column we had between tables to merge them together to enable further analysis such as 911 calls within a radius of a demolished property (accomplished by merging police and fire data with demolition data). Continuing with that example, conducting analysis on the 50% that did match, while not guaranteed to be meaningful or significant, would have been possible with additional hand coding and manipulation, requiring time and resources we simply did not have. Thus, since we were unable to merge files with an acceptable match percentage, we were limited in the analyses we could run in order to obtain meaningful and useful results for the Land Bank.

Conclusion

Ohio has experienced an increase in foreclosures following the 2008 recession. The Land Reutilization program produced tremendous impact across Ohio following the foreclosure crisis that crippled its economy these past few years. Furthermore, the Land Reutilization program provides generous funding mechanisms that can be tapped, including funds from the Hardest Hit Fund, through which the Butler County Land Bank recently received an infusion of access to funds. The Land Bank affords the opportunity to efficiently control dilapidated properties and streamline demolitions through the utilization of such funds. In determining the effectiveness of the Land Bank thus far, the results of the current analysis suggest the possibility of positive spillover effects related to blight removal. Specifically, blight removal is associated with higher home values (in Hamilton) and lower incidences of foreclosure (in Middletown). Further data collection and additional analyses are advised to study the ongoing effects of the Land Bank program.

Our analysis also suggests that a differential relationship exists between Hamilton and Middletown. The correlative effects of housing values and blight removal appear to be significant in Hamilton but not in Middletown. However, our analysis established an association between foreclosure rates and blight removal for the city of Middletown, but not Hamilton. Although the background section of this report points to the difference in how each city addresses, takes ownership of, and disposes of each property, there is not enough information to draw a definitive conclusion as to why the results differ by city.

This report also discussed the removal of harmful toxins, such as asbestos and lead, from the environment where demolitions are conducted. Although we did not have access to recent data measuring the amount of toxins removed, or the effects of this removal, there is undoubtedly a benefit that is gained when reducing exposure to materials that are deemed harmful. Despite the fact that toxin removal was not included in the data collection or analysis phases, studies in other cities indicate that toxin removal is a significant enough issue to raise awareness.

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