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The net benefit of demolishing dilapidated housing: The case of Detroit

Dusan Paredes[a], Mark Skidmore[b,*]

[a] Universidad Católica del Norte, Chile
[b] Michigan State University, United States

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ABSTRACT

We conduct an analysis of the costs and benefits of public investment in demolishing dilapidated residential housing in Detroit. While we estimate a positive net impact of demolitions on nearby property values, we also calculate a low marginal impact on local property tax collections. Under existing housing market conditions in Detroit, demolition costs exceed the present value of additional property tax revenues resulting from demolitions over 50 years. Using efficiency as the criteria for justifying spending public funds on demolition, average property values would have to increase by a factor of five to justify the demolition program.

1. Introduction

A challenge in declining urban areas is managing an aging and depreciating housing stock. Demolition policies mitigate the negative externalities associated with blighted properties; other benefits are derived from savings in municipal service costs such as police and fire. However, demolitions also have costs that are typically covered by local governments or transfers from state or federal governments. The benefit-cost tradeoff is critical for determining whether demolishing dilapidated structures is an efficient mechanism for revitalizing struggling neighborhoods. While the demolition of a blighted property may generate positive price effects for nearby properties, demolishing a dilapidated structure also generates a new vacant lot, which may also have offsetting negative price effects. A deeper empirical analysis is needed to determine the net effect. In this article, we use detailed data from Detroit, Michigan to evaluate the net price effects of demolishing dilapidated structures as well as the time it takes to recover costs through additional property tax collections generated from higher property values resulting from the removal of dilapidated structures.

Our analysis uses parcel level data on sales prices and housing characteristics provided by City of Detroit's Assessment Division. This data set contains about 336,000 residential parcels of which around 34,000 parcels were sold during the 2009–2012 period. Unique information from the 2009 Detroit Residential Survey, conducted by Data Driven Detroit, is also used in the analysis. This survey records the physical condition of all residential parcels in the city, categorizing each as a vacant lot, dilapidated unoccupied property, or occupied property in varying degrees of dilapidation. At the time of the survey, around 91,000 (27%) residential parcels were vacant and 33,000 were categorized as dilapidated (10%). We also merge data on demolitions that occurred in the years following the survey as registered by the State of Michigan Department of Environmental Quality. The 6300 demolitions of dilapidated properties created 6300 vacant parcels.

As a prelude to the full analysis, we estimate a 3% reduction in the average sales price of a property for an additional dilapidated property within a 0.1 mile radius of a sold property. Negative price effects are found at a distance of up to 0.125 miles, but the impact diminishes with distance. However, after the demolition there is a remaining a vacant lot, and a vacant lot is estimated to generate a negative price effect of about 1% on the price of a nearby sold property. Using both the dilapidated and vacant lot price elasticities, we evaluate the effect of the demolition policy on city property values and thus the property tax base. These results are robust to controlling for spatial autocorrelation and spatial heterogeneity at neighborhood and census tract levels. We also compare the benefits to the overlying local governments, including city government, of the demolition policy as measured as the present

* Corresponding author.
E-mail addresses: dparedes@ucn.cl (D. Paredes), mskidmor@msu.edu (M. Skidmore).

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value of increased future tax collections and compare these benefits to the costs of demolishing the dilapidated structures. Our evaluation suggests that it may take more than 50 years to recover the initial costs of demolitions under our most optimistic scenario.

The organization of this article is as follows. Section 2 summarizes the literature related to negative price effects derived from blighted properties, as well as the previous research evaluating the benefits and costs of demolition policies. This section also includes a discussion to the research on teardowns in more vibrant cities; in contrast to demolition that results in an empty lot, construction of new higher quality structures typically follow a teardown. Section 3 describes our data, and Section 4 presents the identification strategy. Section 5 presents the estimated price effects of dilapidated and vacant units and uses these estimations to set the tax collection scenarios. Section 5 concludes.

2. Literature review

For many years local governments in struggling urban areas have used demolition of distressed properties to mitigate the externalities associated with blighted properties, thus increasing the value of nearby properties, as well as reducing the public safety costs associated with criminal activity, arson, and the like (Bass et al., 2012). Demolitions have a cost, however, that are typically covered by the local government or transfers from higher levels of government.[1] Measuring these tradeoffs is vital for assessing the validity of demolition policies as an efficient mechanism to revitalize struggling neighborhoods. Unlike previous studies, we propose that evaluation must not only consider the expected positive price effects, but also the time to recover the investment through property tax collection. In this context, we offer a review of the literature that addresses two questions:

1) How large is the marginal price benefit of transforming a dilapidated property to a vacant lot?
2) How much time does it take to recover the demolition costs via increased property tax collection?

2.1. Teardown vs. demolition

In Detroit, it is most often the case that when a house is demolished, redevelopment does not occur. That is, a demolition typically results in a vacant lot. In contrast, in many cities across the U.S. low quality houses are often torn down to make room for new higher quality structures. Thus, there is a distinction between a “demolition” and a “teardown”. With a demolition, there is no reconstruction on the resulting empty lot, whereas with a teardown redevelopment typically occurs on the lot. Researchers such as Rosenthal and Helsley (1994), Dye and McMillen (2007), McMillen and O'Sullivan (2013), Charles (2013), and Munneke and Womack (2015) have all examined teardowns in the context of redevelopment. The work of Rosenthal and Helsley (1994) supports the notion that structures are demolished when the price of vacant land exceeds the price of land in its current use. Dye and McMillen (2007) use data from Chicago to show that the sales price of teardown properties are about equal to land value. McMillen and O'Sullivan (2013) introduce the notion of uncertainty over the future price of structural capital in a model of the demolition vs. preservation decision. Their model and empirical findings suggest that the introduction of uncertainty results in a market price of redeveloped property that increases with the quantity of structural capital. In a recent article, Munneke and Womack (2015) examine decisions to partially redevelop (renovation) vs. fully redevelop (tear down), showing the importance of structural attributes, land attributes, location, and prior redevelopment activity in the decision to renovate or teardown/redevelop. Importantly, all of this work highlights the role markets play in teardown/redevelopment decisions; in these studies property values are high enough to motivate economic agents to take action. In contrast, nearly all demolitions are subsidized because market values are not high enough to generate market-driven teardown and redevelopment activity. For this reason, our study is most relevant to policymakers and researchers struggling to implement effective policies in cities such as Detroit that are struggling with population decline.

2.2. Price effect of distressed and vacant properties on nearby houses

There is another strand of relevant research that examines the negative spillovers of foreclosures. Existing research shows that the intensity of foreclosed (and thus potentially distressed) properties is negatively correlated with nearby housing prices (Anenberg and Kung, 2014; Campbell et al., 2011; Gerardi et al., 2015; Hartley, 2014; Whitaker and Fitzpatrick, 2013). However, researchers such as Whitaker and Fitzpatrick (2013, pp.79–80) argue that the economic mechanism behind this correlation is unclear because, in the context of foreclosures, there is a *competition* effect and an *amenity* effect. That is, there is a supply or competition effect through the injection of additional housing properties to the local market. On the other hand, if foreclosed properties are neglected, abandoned or vacant, then negative externalities are responsible for depressing the prices of nearby properties via a negative spillover effect; this is the so called amenity effect.

This empirical controversy has triggered several efforts to disentangle the two effects. Assuming that foreclosed properties are similar to other properties offered in the housing market, Hartley (2014) segments the markets between single-family and multifamily to identify the price effect of new foreclosures. If the new foreclosure is a single-family property, then both the supply and amenity effects are expected. However, only the amenity effect is expected for foreclosed multi-family units because multi-family dwellings are considered to be in a different market than single-family residential. Using this identification strategy for Chicago, Hartley estimates a supply effect of 1.2% on nearby property prices. Anenberg and Kung (2014) corroborate the Hartley's finding with an analysis using prices listed in Multiple Listing Service for San Francisco, Washington, DC, Chicago and Phoenix. They find that prices fall after the inclusion of a new real estate owned (REO) properties, suggesting that the price drop is evidence of a supply effect.[2]

However, the literature also provides some support for the amenity effect. Campbell et al. (2011) analyze foreclosures in Massachusetts over the period 1987 through 2009, indicating that forced sales reduce prices of nearby properties by 3% to7%. However, the authors reject the supply effect, arguing that *“this evidence suggest ...[low prices]... reflect poor maintenance of houses”*. Additional work such as articles by Leonard and Tammy (2009) and Immergluck and Smith (2006) reach similar conclusions using different data sets and econometric techniques.

Lee (2008), Harding et al. (2009), Zhang and Leonard (2014) also consider the impacts of foreclosures on neighborhood property values; concluding that foreclosed properties have a negative effect on nearby properties. Most recently, Zhang, et al. (2016) show that the negative externalities associated with foreclosures were much larger for longer foreclosure processes, suggesting that negative externalities are primarily associated with the blight channel.

Although the evidence is somewhat mixed regarding the mechanism driving the relationship between foreclosures and nearby property prices, the research clearly demonstrates a negative correlation be-

[1] An example is the U.S Treasury' Hardest Hit Fund that assigned almost $8 billion for preventing the foreclosure of residential properties across 18 states.

[2] Real Estate Owned property is property that goes back to the mortgage company after an unsuccessful foreclosure auction.