Changes in the Benefits of the Taxable Value Cap when Property Values are Decreasing: Evidence from Michigan

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Abstract

We evaluate the changes in the benefits of the taxable value cap in the property tax in Michigan, stemming from decreases in real-estate values. We find a substantial increase in the dispersion of benefits. Comparing results for 2012 with results for 2008, we find that the tax savings for long-time homeowners were reduced in areas with low and medium rates of population growth, but that the benefits increased by 60 percent in high-growth areas. We also find that, in areas that experienced greater price appreciation before Michigan's housing-price decline than depreciation during the decline, long-time homeowners experienced reductions in their effective property-tax rates of 1.08 mills for each year of ownership. However, long-time homeowners in areas with pre-crisis appreciation that was substantially smaller than the subsequent depreciation actually experienced *higher* effective tax rates, relative to new homeowners.

Keywords: Property Tax, Assessment Growth Limit, Tax Incidence

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I. Introduction

In an effort to reduce the extent to which property taxes can increase in the face of rapidly rising housing prices, many U.S. states have enacted limitations on the growth rate of residential property-tax assessments.[1] In addition, most states with a taxable value cap have an "acquisition value feature", under which the taxable value of a property will "pop up" to full market value when the property is sold or transferred. When these two features of tax law are combined, it becomes possible for identical properties in the same jurisdiction to have very different property-tax obligations.

In Michigan, as in many parts of the United States, residential real-estate prices began to fall in the middle of the first decade of the 21st century, although there is considerable variation in the exact timing and extent of the price decreases. Recent research has focused primarily on the distributional consequences introduced by assessment growth limits during periods when housing prices are *rising*. However, there has been little research regarding the evolution of distributional inequities when housing prices are *falling*.

We use data from a survey of Michigan residents to analyze the distributional effects of the taxable value cap. The survey was conducted in 2012, by which time aggregate assessed

[1] Haveman and Sexton (2008) identify 19 states and the District of Columbia as having some sort of limitation. Such limitations have been referred to as "assessment growth caps," "taxable value caps," "assessment growth limits," and "property value assessment limits." We use these terms interchangeably.

values of residential real estate in Michigan had been falling for five years. Our estimates indicate that, on average, homeowners received a reduction in their effective property-tax rate of 0.36 mills for each additional year of ownership.[2] Despite substantial decreases in property values in many parts of the state, this estimate is only slightly smaller than the estimate by Skidmore, Ballard, and Hodge (2010) for 2008, when assessed values were very near their peak. They found that long-time homeowners received an average reduction in their effective tax rate of 0.39 mills for each additional year of homeownership. Thus, when we compare the results for 2012 with the results for 2008, we find only a modest reduction in the *average* size of the benefit from the taxable value cap. However, we find much larger effects on the *dispersion* of those benefits across different areas. In areas with low and medium rates of population growth, the tax savings for long-time homeowners were reduced substantially. This result is consistent with Sexton and Sheffrin (1998), who found that the benefits from the taxable value cap decreased in areas with decreasing property values. However, in areas with high population growth, we find that long-time homeowners experienced *greater* tax reductions in 2012 than in 2008.

We also examine how the effects of the taxable value cap vary across areas with different price trends before and after Michigan's housing-market decline. In areas with housing-price appreciation before 2006 that was much greater than depreciation during the decline, long-time homeowners had reductions in their effective property-tax rates of up to 1.08 mills for each year of ownership. This estimate is considerably larger than any reduction measured by Skidmore *et al*. (2010). However, long-time homeowners in areas with pre-crisis appreciation that was

[2] "Mill" refers to the millage rate, where one mill equals $1 in property taxes for each $1000 of taxable property value.

substantially smaller than the subsequent depreciation actually experienced *higher* effective tax rates, relative to new homeowners.[3] These results indicate that, when we compare 2012 with 2008, the most important effects are on the dispersion of the benefits of the taxable value cap, rather than on its statewide average.

In Section II, we discuss the literature related to assessment growth limits, with particular emphasis on previous research examining Michigan's limit and the effects of a limit in housing markets with decreasing property values. In Section III, we describe the assessment growth limit in Michigan and its potential to create different property-tax obligations for identical properties in the same jurisdiction. Our data and the regression model are described in Section IV. The results are presented in Section V, and section VI concludes.

II. Previous Research

Empirical research on assessment growth limits has focused primarily on:

(1) the degree to which these limitations have constrained the growth of property-tax revenues (Amiel, Deller, Stallmann, and Maher, 2014; Connolly and Bell, 2014; Dye, McGuire, McMillen, 2005; Maher, Deller, Stallmann, and Park, 2016; Mullins and Joyce, 1996; Skidmore, 1999);

(2) the distributional implications of assessment growth limits during periods of property-value growth (Dye, McMillen, and Merriman, 2006; Muhammad, 2007; Skidmore, Ballard, and Hodge 2010; Connolly and Bell, 2014);

[3] This seemingly paradoxical result appears to be due to adjustment lags in the assessment of properties that have not been sold recently. We discuss this further below.

(3) the potential "lock-in" effect, by which the taxable value cap provides an incentive for homeowners to stay in their current home (Nagy, 1997; Stohs, Childs, and Stevenson, 2001; Wasi, White, Sheffrin, and Ferreira, 2005; Stansel, Jackson, and Finch, 2007; Ferreira, 2009; Ferreira, Gyourko, and Tracy, 2010; Ihlanfeldt, 2011; Hodge, Skidmore, and Sands, 2015); and

(4) the effect of these limitations on property values (Guilfoyle, 1998; Bradley, 2011).

Skidmore *et al*. (2010) and Sexton and Sheffrin (1998) are of particular relevance for the present work. Skidmore *et al*. (2010) use survey data to examine the distributional consequences of the assessment growth limit in Michigan. As mentioned earlier, they find that, in 2008, effective property-tax rates were reduced by an average of 0.39 mills for every year of homeownership, all else equal. However, this effect varied across jurisdictions within Michigan. The estimated benefit for homeowners in low-growth areas was 0.29 mills for every year of homeownership, but this effect fell short of statistical significance. On the other hand, effective tax rates in medium- and high-growth areas were reduced by 0.48 mills for every year of homeownership, and these effects were strongly significant. We extend the work of Skidmore *et al*. (2010) by examining the ways in which the inequities from Michigan's taxable value cap have changed as a result of decreasing home values.

To date, only one other study has examined the effect of a housing slump on the inequities created by an assessment growth limit. As an update to the work by O'Sullivan, Sexton, and Sheffrin (1995), Sexton and Sheffrin (1998) examine the effects of California's recession from 1991 to 1995. They find that California's declining real-estate market reduced the inequities resulting from the taxable value cap that was instituted in 1978, with the passage of Proposition 13. Specifically, the average tax savings for those owning their home since the

passage of Proposition 13 decreased by 26 percent in Los Angeles County, and by 5.7 percent in San Mateo County. These reductions mirrored the reductions in housing values experienced in the two counties. We add to the work of Sexton and Sheffrin in two ways. First, we examine a larger number of areas (representative of the entire State of Michigan), which experienced different price trends before and after the peak of housing prices in Michigan. Second, we consider a period with larger reductions in housing prices.

III. Effects of Michigan's Assessment Growth Limit

Michigan's assessment growth cap was established as a result of Proposal A, an education finance reform approved by voters in 1994.[4] Prior to the passage of Proposal A, the property tax for any individual property was based on its *state equalized value* (SEV), which is equal to 50 percent of the property's assessed market value. After 1994, property taxes were based on the *taxable value* of the property (TV), which could either be equal to or less than SEV, but not greater than SEV. The increase in TV for each successive year of homeownership is limited to the rate of inflation, regardless of the increase in SEV.[5] Proposal A also specifies that the TV of a property must return to its market-based SEV when the property is sold or transferred.[6] Thus,

[4] For an extensive review of the effects of Proposal A on property taxation in Michigan, see Feldman, Drake, and Courant (2003). For more on the history of tax and expenditure limitations in Michigan, see Drake (2003) and Fino (2003).

[5] The law specifies that an increase in a property's taxable value is limited to the lesser of the rate of inflation (measured by the national Consumer Price Index) or 5 percent. Effectively, this means that taxable value increases have been restricted solely by the rate of inflation, since the inflation rate has remained below 5 percent in every year since the passage of Proposal A.

[6] This "pop up" applies to any sale or transfer, including the transfer of property between family members.

substantial inequity in the tax treatment of similar properties within a jurisdiction may arise when housing prices grow more rapidly than the general price level; the TV of a newly sold property will be equal to SEV while, over time, the TV for a long-time homeowner will fall further and further below SEV.

However, when assessed market values are falling, Michigan law specifies that TV may continue to increase until it is equal to SEV. Once TV and SEV are equal, they will continue to be equal until the property's assessed market value once again increases at a rate faster than inflation. The *effective* property-tax rate faced by a homeowner is therefore a function of the time path of changes in assessed market value, the time path of the rate of inflation, and the owner's length of residence.

In an effort to provide the reader with a sense of the complicated dynamics that may arise from Michigan's taxable value cap, Figure 1 shows the trajectories of SEV and TV for a single residential property in Ingham County, Michigan.[7] The home was purchased in 1991, three years before passage of Proposal A. Thus for the first three years shown in Figure 1, SEV and TV are the same. After 1994, SEV exceeded TV by increasing amounts every year until 2006. In 2007, SEV fell sufficiently far that TV was also reduced.[8]

<Figure 1 here>

[7] As noted above, SEV is equal to 50 percent of assessed market value. Thus the values of SEV shown in Figure 1 are one-half as large as the assessed market values for this property.

[8] Local property-tax assessors are understandably reluctant to reduce assessed values substantially. The assessment for the property shown in Figure 1 was only reduced when the homeowner provided the assessor with evidence that the values of comparable properties had fallen. For many properties in Michigan, assessed values adjusted only slowly to the decrease in market prices.

The SEV of this property continued to fall for the next two years, and TV was forced to fall by the same amount since it can never exceed SEV under Proposal A. In 2010 and 2011, SEV increased by less than the rate of inflation, so that SEV and TV continued to be equal to each other. In the next few years, SEV grew fast enough that it exceeded TV by a small margin. The property was then sold, and taxable value was "popped up" to SEV.

Figure 2 shows the total amount of SEV and TV for the entire State of Michigan, from 1994 to 2012. The taxable value cap resulted in a growing divergence between aggregate SEV and aggregate TV for residential properties from 1994 to 2005. The percentage difference between aggregate TV and aggregate SEV reached its peak in 2005, when aggregate TV was only 76 percent of aggregate SEV.

<Figure 2 here>

Aggregate SEV continued to grow until 2007, even though, as we have seen, some individual properties began to lose value earlier than that. Between 2007 and 2008, Michigan experienced the unusual combination of *decreasing* aggregate SEV and *increasing* aggregate taxable value. After 2008, aggregate SEV fell more rapidly, and aggregate taxable value also began to decline. By 2012, aggregate TV was 92 percent of aggregate SEV.[9]

For the individual property shown in Figure 1, the gap between assessed value and

[9] It is important to note that tax-base erosion occurred unevenly in different regions of Michigan. In rural Keweenaw County in 2008, aggregate TV was less than 58 percent of aggregate SEV. On the other hand, in Oakland County (an affluent suburban county, with the highest per-capita income and second-highest population in Michigan), aggregate TV was 87 percent of aggregate SEV in 2008. Although differences between aggregate TV and SEV narrowed by 2012, differences among counties did not-- aggregate TV in 2012 was 64 percent of aggregate SEV in Keweenaw County, and 97 percent of aggregate SEV in Oakland County.

taxable value was eliminated completely for a few years. Figure 2 indicates that this did not occur in the aggregate. Nevertheless, Figure 2 shows that the gap between aggregate SEV and aggregate TV was reduced as a result of decreasing property values.

According to Connolly and Bell (2014, p. 133), "few states estimate the consequences of the assessment limit… in annual tax expenditure reports." Michigan is one of the states that provides such estimates. Every year, the Office of Revenue and Tax Analysis of the Michigan Department of Treasury estimates the dollar value of the tax expenditures associated with many aspects of the Michigan tax system, including the taxable value cap. The fluctuations in the gap between SEV and TV are reflected in the tax-expenditure estimates, shown in Figure 3. The revenue loss associated with the taxable value cap was estimated to be $1.09 billion in the 1999 fiscal year, the first year for which this estimate was made. In the next eight years, the tax expenditure is estimated to have risen to $3.85 billion before falling to $890 million in the 2015 fiscal year, and then rebounding in 2016 and 2017.

<Figure 3 here>

IV. Data and Econometric Issues

To examine the changes in the benefits of the taxable value cap that resulted from falling property values, we placed several questions about property-tax payments and home values in Michigan State University's State of the State Survey (SOSS) in the summer of 2012.[10] The

[10] SOSS is a telephone interview survey of Michigan adults. It has been conducted regularly since 1994 by the Institute for Public Policy and Social Research (IPPSR) at Michigan State University. More information about SOSS is available at http://www.ippsr.msu.edu/SOSS. The codebook, methodological report, and data for Round 62 of SOSS are available at http://www.ippsr.msu.edu/SOSS/SOSSdata.htm.

questions regarding 2012 property-tax payments and home values are identical to the questions for 2008 used by Skidmore *et al*. (2010). The survey allows us to link individual economic and demographic data with tax rates, property values, and years of ownership, to evaluate the distributional consequences of the taxable value cap in ways that are not possible with Census data, or with data on tax records from local jurisdictions.

Every round of the survey contains information from a stratified random sample of Michigan adults.[11] We believe that evidence from Michigan (the tenth most populous state in the United States) is of interest in its own right. More importantly, the demographic, economic, and social characteristics of the Michigan population are rather similar to national averages in most respects, which may make it possible to generalize our results to the broader American population. However, we do not want to overstate the extent to which our results can be generalized, since tax and expenditure limitations vary considerably among different jurisdictions in the United States.

This survey resulted in 1015 completed interviews. However, a number of the interviews are excluded from our analysis. In particular, 137 of the survey respondents were not homeowners,[12] 311 respondents failed to answer key questions needed for our analysis, and 55 respondents provided inconsistent information about age and homeownership. Furthermore, the

[11] The weighted sample is representative of the Michigan adult population. All of the statistical analyses reported in this article use the appropriate survey weights.

[12] We distinguish between homeowners (who are included in the analysis) and renters (who are excluded) on the basis of a survey question that asked "Is your home owned by you or someone in your household with a mortgage (home loan), owned by you or someone in your household without a mortgage or loan, rented by you or someone in your household or occupied without payment of cash rent?"

survey data include several observations for which the calculated effective tax rates are extreme outliers. For example, if taken at face value, the answers from one respondent imply an effective tax rate of 40,000 mills. Although Hodge, McMillen, Sands, and Skidmore (2017) show that, as a result of over-assessment, a homeowner's effective tax rate may indeed be greater than the statutory rate in her jurisdiction, it is very unlikely that the effective tax rate could be this large. Therefore, using the standardized residuals method for identifying outliers, we excluded this observation and seven other observations from the analysis below.[13] These exclusions yield a total sample of 504 observations.

Detailed definitions of the variables used in the analysis are shown in Table 1, and summary statistics for the variables are shown in Table 2. Table 2 includes summary statistics for the entire usable sample, as well as for three sub-groups, based on population growth rates for counties.[14] Table 2 shows that the average effective property-tax rate in 2012 was nearly 40 mills, which is an increase of 46 percent from the average effective tax rate of about 27 mills in 2008. This increase in average effective property-tax rates took place throughout the state, although the rates of increase differed by region. The average effective tax rates increased by 53

[13] The standardized residual provided by STATA is the same as the "internally Studentized" residual of Chatterjee and Hadi (1988). We excluded from the regressions the eight observations for which the value of the internally Studentized residual was greater than 3.0.

[14] We use the rates of population growth from 1994 to 2012. This division of the sample is similar to that of Skidmore *et al.* (2010). We have also calculated summary statistics and regression results using the low-, medium-, and high-growth areas implemented by Skidmore *et al.* (*i.e.*, population growth rates between 1994 and 2007). Our results are robust in this regard, largely because most counties fall into the same growth-rate categories in both cases.

percent in areas with low rates of population growth, by 50 percent in the medium-growth areas, and by 25 percent in high-growth areas.

<Tables 1 and 2 here>

Since we are also interested in the relationship between price trends and the benefits for long-time homeowners from the taxable value cap, we create four additional variables that were not implemented by Skidmore *et al*. (2010). We specify these variables, which we call *VERY NEGATIVE*, *NEGATIVE*, *POSITIVE*, and *VERY POSITIVE*, at the zip-code level, based on the different paths of average annual sale prices before and after 2006.

Different regions of Michigan experienced similar average annual price increases until 2006. This can be seen in Table 2, where the values of *PRE-CRISIS PRICE TREND* are very similar in regions with different growth rates. However, after prices began to fall, different regions experienced rather different price decreases, as shown by the values of *POST-CRISIS PRICE TREND*. The average price decreases in low-growth areas were about twice as large as the average price decreases in high-growth areas.

Our strategy for identifying the effect of the taxable value cap on effective property-tax rates is to estimate effective tax rates as a function of individual and community characteristics, for the sample of homeowners who answered all of the relevant survey questions. Thus our specification is:

$$[1] \qquad EFFECTIVE\ RATE_i = \alpha + C_i\boldsymbol{\beta} + \gamma YEARS\ SINCE\ A_i + \varepsilon_i ,$$

where $EFFECTIVE\ RATE_i$ is the effective property-tax rate of homeowner i, C_i is a vector of community characteristics, $YEARS\ SINCE\ A_i$ is the number of years homeowner i has owned his/her property since the passage of Proposal A, and ε_i is the error term.

To account for expected differences in millage rates, we control for community characteristics using variables such as *URBAN CITY*, *URBAN TOWNSHIP*, and *DETROIT*. However, the key variable of interest is *YEARS SINCE A*. We expect that the estimated coefficient for this variable will be negative. That is, after controlling for other influences, long-time homeowners are expected to have lower effective property-tax rates than those who purchased their homes more recently. However, since many long-time homeowners experienced substantial decreases in their property values, we expect the coefficient on *YEARS SINCE A* for 2012 to be smaller, in absolute value, than it was in 2008.

We interact *YEARS SINCE A* with indicator variables referring to counties with different population growth rates (*LOW*, *MEDIUM*, and *HIGH*) to see how the disparities have changed in these areas over time. Finally, we interact *YEARS SINCE A* with indicator variables referring to areas with different housing-price trends. This allows us to examine more directly the ways in which changes in the housing market affected the benefits that are received by long-time homeowners, as a result of the taxable value cap.[15]

[15] A number of homeowners failed to provide usable answers to the questions about property taxes and home values. Thus there is the potential for sample-selection bias. To understand whether sample selection may be an issue, we have examined the data from two different perspectives. Our first approach is a simple comparison of full-sample summary statistics with those presented in Table 2. The mean for each variable in Table 2 is similar to its corresponding full-sample mean, well within the 95-percent confidence interval. Our second approach corrects for possible selection bias by implementing the procedure of Heckman (1979). Following the approach of Skidmore *et al*. (2010), we use *EDUCATION* and *BLACK* in the selection equation. In additional Heckman models, we include *EDUCATION*, *CHILDREN*, and *INCOME* as instruments. All of the Heckman results, which are available on request, are very similar to those presented in the next section.

V. Empirical Analysis

We present our regression results in Table 3. In column (1), we combine all households into one category, and thus do not distinguish households by the growth rates of either population or property values in their areas. However, different areas in Michigan experienced substantial variation in both of these growth rates. Therefore, in columns (2) and (3), we present results in which the variable for years of ownership is interacted with indicator variables for counties with low, medium, and high rates of population growth, and with indicator variables for areas with different rates of growth or decline of sale prices, before and after the peak of the real-estate market.[16]

<Table 3 here>

First, we consider the coefficients for the control variables. The coefficient for *POPULATION* is positive in all columns of Table 3, and statistically significant in the last column. This means that, controlling for community characteristics, communities with larger populations had higher effective property-tax rates in 2012. The coefficient on *WEALTH* is negative in all columns of Table 3, and statistically significant in the first two. This indicates that communities with higher property values have lower effective tax rates, all else equal. This is not surprising since a jurisdiction with higher property values can have lower tax rates and still generate at least as much property-tax revenue as a jurisdiction with lower property values. The coefficient for the variable indicating whether a participant lives in a mobile-home park

[16] Column (3) of Table 3 has a smaller sample size than columns (1) and (2). The independent variables used in column (3) were calculated on the basis of trends in home sales prices at the zip-code level, but some survey respondents did not provide sufficient information for us to identify their zip code, and we did not have complete data on sale prices for some zip codes. There is no clear pattern of sample selection resulting from these exclusions.

(*MOBILE HOME*) is negative and highly significant. This is also to be expected, since Michigan law exempts residents of mobile-home parks from property taxes.

The coefficient for *DETROIT* indicates that Detroit residents are subject to effective tax rates that are substantially higher than those in the rest of the state, after controlling for other factors. This result is also expected, for two reasons. First, Detroit residents are subject to higher *statutory* tax rates (the average statutory property-tax rate was 66.61 mills in Detroit, which is more than 60 percent higher than the statewide average). Second, assessment practices in Detroit may have caused assessed values to be higher than market values (Hodge, Skidmore, Sands, and McMillen, 2015).

Next, we turn to the estimated effect of *YEARS SINCE A* on effective tax rates, as shown in column (1) of Table 3. All else equal, an increase in the number of years of ownership is associated with a decrease in the effective property-tax rate. Specifically, the estimated coefficient suggests that effective property-tax rates fall by about 0.36 mills for every year of ownership.[17] This effect is slightly smaller than the effect for 2008 estimated by Skidmore *et al.* (2010), who found that effective tax rates were reduced by about 0.39 mills for every year of ownership.

As we have emphasized above, our estimates suggest that the most important effects of the changes in housing prices between 2008 and 2012 are on the dispersion of the benefits from the taxable value cap, rather than on the average value of these benefits. This can be seen in

[17] This estimate suggests that if, at the time of the survey, a Michigan resident had owned their home for 10 years and the property's SEV had been $100,000 (with assessed market value of $200,000), the property-tax bill would have been reduced by $360 as a result of the taxable value cap.

column (2) of Table 3, which shows the tax benefits for long-time homeowners in areas with different rates of population growth. The coefficient for areas with low rates of population growth is small, and falls far short of statistical significance. By contrast, Skidmore *et al.* (2010) found an effect in low-growth areas in 2008 that was more than twice as large as the effect we find for 2012, and their estimate for 2008 fell just short of statistical significance. Our coefficient for areas with medium rates of population growth indicates that effective tax rates are reduced by about 33 mills for every year of homeownership, but this estimate also falls short of statistical significance. By contrast, Skidmore *et al*. (2010) found an effect in medium-growth areas that was notably larger, and statistically significant. Finally, the coefficient for areas with high rates of population growth is negative, highly statistically significant, and *larger* than the effect found in 2008. Our estimates for 2012 indicate that effective property-tax rates are reduced by about 0.77 mills for every year of ownership in areas with high rates of population growth; this effect is considerably larger than the reduction of 0.48 mills for every year of ownership found by Skidmore *et al.* (2010) for areas with high population growth rates in 2008. These comparisons suggest that, while the statewide average benefits to long-time homeowners diminished slightly as a result of the decline in housing prices, the effect varies quite substantially by region.

Finally, column (3) of Table 3 provides a new look at the benefits of the taxable value cap by examining the differences between areas with varying degrees of growth in property values, before and after the peak of home prices. The coefficient on *YEARS SINCE A x VERY POSITIVE* indicates that, in areas in which price depreciation after the peak of housing prices was small relative to price appreciation before the peak, long-term homeowners had effective

property-tax rates in 2012 that were 1.08 mills lower for each additional year of ownership. This is 125 percent larger than the largest estimate from Skidmore *et al.* (2010), and 40 percent higher than the highest estimate from column (2). At the other end of the spectrum of property-value changes, the coefficient for *YEARS SINCE A x VERY NEGATIVE* is positive. This indicates that long-time residents in areas with large reductions in property values, relative to appreciation prior to the peak of home prices, actually have *higher* effective property-tax rates than new homeowners. This may seem surprising, but it is consistent with the analyses of Hodge *et al.* (2017), Dewar, Seymour, and Druta (2015), and Atuahene and Hodge (2018). Their results suggest that assessments have not decreased as much as would have been indicated by the true decrease in market values, especially in those areas with the largest degrees of price depreciation. Specifically, these researchers examine this finding in Detroit, and a majority of the respondents with the *VERY NEGATIVE* indicator live in Detroit.

VI. Conclusion

We evaluate the changes in the distributional consequences of Michigan's taxable value cap between 2008 and 2012. We find that the homeowner's effective property-tax rate is negatively related to the length of homeownership in most cases. Specifically, our estimates indicate that, in 2012, long-time homeowners receive an average reduction in their effective property-tax rates of 0.36 mills for each additional year of ownership, all else equal. This effect is slightly smaller than the estimated effect reported by Skidmore *et al.* (2010), who found that long-time homeowners in Michigan received a tax-rate reduction of 0.39 mills for each additional year of ownership in 2008. Despite the small reduction in the average size of the effect for the state as a

whole, we find that the benefits for long-time homeowners actually *increased* from 2008 to 2012 in areas with high rates of population growth. Even after a period in which housing prices fell, on average, long-time residents continued to receive substantial benefits from the taxable value cap in high-growth areas, but not in low- and medium-growth areas.

For 2012, we also find that, in areas with greater price appreciation before the peak of housing prices in Michigan than depreciation during the decline, long-time homeowners experienced reductions in their effective property-tax rates of 1.08 mills for each year of ownership. On the other hand, long-time residents in 2012 in areas with less price appreciation received much smaller benefits from the taxable value cap. Thus our results indicate that, when we compare 2012 with 2008, the most important effects are on the *dispersion* of the benefits of the taxable value cap, rather than on its statewide average.

Our results suggest that eliminating the taxable value cap would remove a persistent source of inequity in Michigan's property tax. Haveman and Sexton (2008) recommend eliminating the taxable value cap, preferring other measures for property-tax relief, such as circuit-breaker programs, partial exemptions for owner-occupied housing, and property-tax deferral options. Each of these alternative tax-relief measures is already in place in Michigan, in one form or another. If the taxable value cap were removed, these and other provisions of Michigan law would still provide substantial checks against excessive growth of property-tax revenues in the future.

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Table 1: Variable Definitions

Variable	Definition
EFFECTIVE RATE	The effective property-tax rate of survey respondents, measured by the tax payment divided by the state equalized value of the property.
POPULATION	The total population of the municipality or township in which the respondent resides.
WEALTH	Wealth of the municipality or township in which the respondent lives, measured by the per-capita state equalized value in the municipality/township.
MOBILE HOME	Indicator variable to distinguish whether a respondent lives in a mobile home park (1= respondent lives in a mobile home park, and 0 otherwise).
DETROIT	Indicator variable to distinguish whether a respondent lives in Detroit (1= respondent lives in Detroit, and 0 otherwise).
URBAN	Indicator variable to distinguish whether a respondent lives in an urban area. This is calculated by using the Census Bureau's definition: an urban area has a population density of at least 1,000 people per square mile, and has surrounding census blocks with an overall density of at least 500 people per square mile (1= respondent lives in an urban setting, and 0 otherwise).
CITY	Indicator variable to distinguish whether a respondent lives in a city (1= respondent lives in a city, and 0 otherwise).
TOWNSHIP	Indicator variable to distinguish whether a respondent lives in a township (1= respondent lives in a township, and 0 otherwise).
YEARS SINCE A	Number of consecutive years a respondent has lived in his/her home since the passage of Proposal A (maximum value = 18 years for difference between 2012 survey date and 1994, when taxable value cap began).
LOW GROWTH	Indicator variable to distinguish whether the respondent lives in a low growth county (1= county in which the respondent lives had an overall population growth rate less than 5% between 1994 and the time of the survey, and 0 otherwise).
MEDIUM GROWTH	Indicator variable to distinguish whether the respondent lives in a medium growth county (1= county in which the respondent lives had an overall population growth rate between 5% and 12% between 1994 and the time of the survey, and 0 otherwise).

Table 1 (continued)

Variable	Definition
HIGH GROWTH	Indicator variable to distinguish whether the respondent lives in a high growth county (1= county in which the respondent lives had an overall population growth rate greater than 12 percent between 1994 and the time of the survey, and 0 otherwise).
VERY NEGATIVE	Indicator variable to distinguish whether the respondent lives in an area that experienced price depreciation after 2005 that was much greater than the appreciation before 2005 (1= zip code in which the respondent lives had an average sale-price decrease from 2006 to 2012 that was at least 2 percentage points greater than average sale-price increases from 1994 to 2005, and 0 otherwise).
NEGATIVE	Indicator variable to distinguish whether the respondent lives in an area that experienced price depreciation after 2005 that was slightly greater than the appreciation before 2005 (1= zip code in which the respondent lives had an average sale-price decrease from 2006 to 2012 that was 0 to 2 percentage points greater than average sale-price increases from 1994 to 2005, and 0 otherwise).
POSITIVE	Indicator variable to distinguish whether the respondent lives in an area that experienced price depreciation after 2005 that was slightly lower than the appreciation before 2005 (1= zip code in which the respondent lives had an average sale-price decrease from 2006 to 2012 that was 0 to 2 percentage points lower than average sale-price increases from 1994 to 2005, and 0 otherwise).
VERY POSITIVE	Indicator variable to distinguish whether the respondent lives in an area that experienced price depreciation after 2005 that was much smaller than the appreciation before 2005 (1= zip code in which the respondent lives had an average sale-price decrease from 2006 to 2012 that was at least 2 percentage points lower than average sale-price increases from 1994 to 2005, and 0 otherwise).

Table 2: Summary Statistics of Variables

(See Table 1 for Variable Definitions)

	Full Sample		**Low Growth**		**Medium Growth**		**High Growth**	
Variable	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
EFFECTIVE RATE	39.78	1.434	46.06	2.454	39.03	2.285	31.25	2.493
POPULATION (City or Township)	37,299	4,241	51,089	9,595	33,628	6,675	21,659	3,989
WEALTH	41,475	2,042	36,501	2,215	40,035	3,895	51,339	4,635
MOBILE HOME	0.006	0.004	-	-	0.006	0.006	0.015	0.014
DETROIT	0.015	0.004	0.039	0.011	-	-	-	-
URBAN CITY	0.461	0.062	0.509	0.094	0.431	0.112	0.432	0.113
URBAN TOWNSHIP	0.078	0.032	0.054	0.030	0.125	0.073	0.046	0.038
RURAL CITY	0.130	0.024	0.113	0.034	0.126	0.044	0.160	0.045
YEARS SINCE A	10.46	0.810	10.12	1.057	11.70	1.377	9.078	1.761
PRE-CRISIS PRICE TREND	0.051	0.001	0.050	0.002	0.050	0.001	0.053	0.001
POST-CRISIS PRICE TREND	-0.044	0.003	-0.055	0.003	-0.043	0.005	-0.027	0.001
Number of Observations	504		219		130		155	

Table 3: Effective Tax Rate Regression Results
(*t*-statistics in parentheses)

	Dependent Variable: *EFFECTIVE RATE*		
Independent Variable	**(1)**	**(2)**	**(3)**
Ln (*POPULATION*)	2.03 (1.37)	2.41 (1.56)	2.81* (1.64)
Ln (*WEALTH*)	-7.94** (-2.11)	-6.71* (-1.81)	-1.98 (-0.47)
MOBILE HOME	-25.95*** (-7.30)	-25.49*** (-6.85)	-34.82*** (-9.85)
DETROIT	29.13** (2.18)	25.79* (1.89)	28.01** (2.04)
URBAN CITY	4.51 (1.26)	3.95 (1.09)	-6.37* (-1.67)
URBAN TOWNSHIP	-2.56 (-0.34)	-3.59 (-0.47)	-12.51* (-1.64)
RURAL CITY	4.12 (0.92)	4.71 (1.06)	1.28 (0.29)
YEARS SINCE A	-0.36* (-1.74)	-	-
YEARS SINCE A x LOW GROWTH	-	-0.11 (-0.43)	-
YEARS SINCE A x MEDIUM GROWTH	-	-0.33 (-1.34)	-
YEARS SINCE A x HIGH GROWTH	-	-0.77*** (-3.26)	-
YEARS SINCE A x VERY NEGATIVE	-	-	0.59* (1.71)
YEARS SINCE A x NEGATIVE	-	-	0.07 (0.22)
YEARS SINCE A x POSITIVE	-	-	-0.53* (-1.92)
YEARS SINCE A x VERY POSITIVE	-	-	-1.08*** (-4.24)
R-squared	0.14	0.16	0.18
Number of Observations	504	504	338
Notes: All regression results are corrected for heteroskedasticity. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels.			

Figure 1: State Equalized Value and Taxable Value for a single Michigan Residential Property, 1991-2014

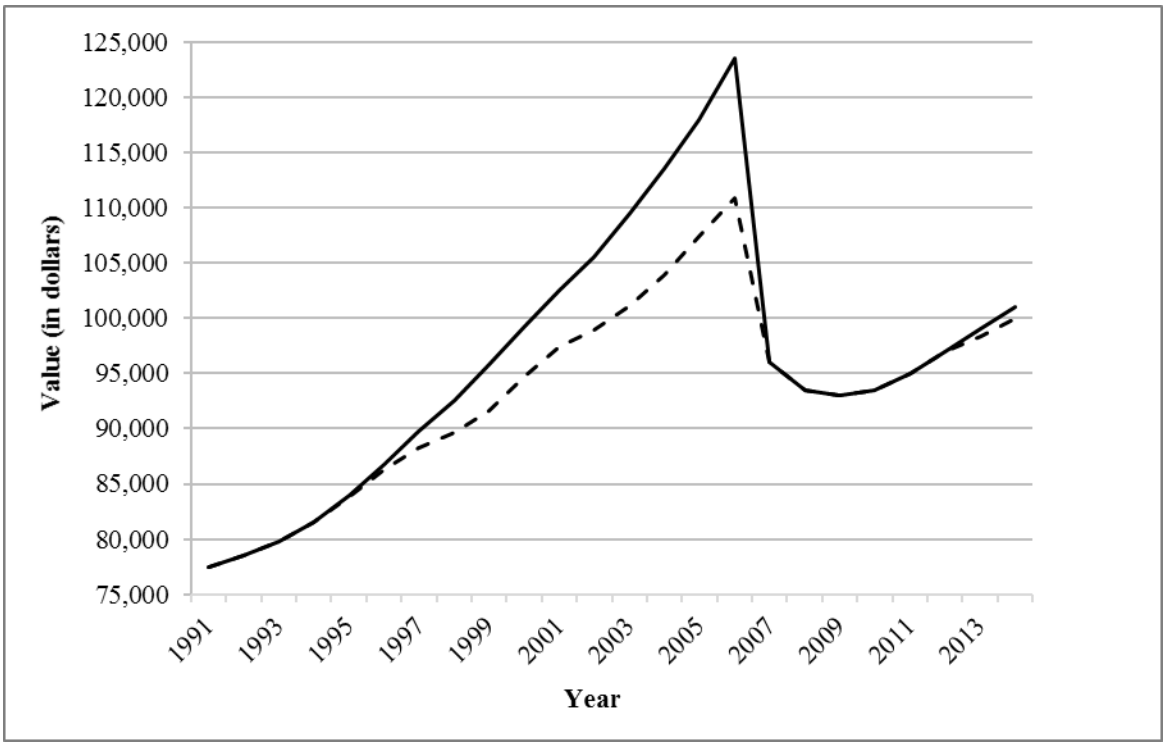
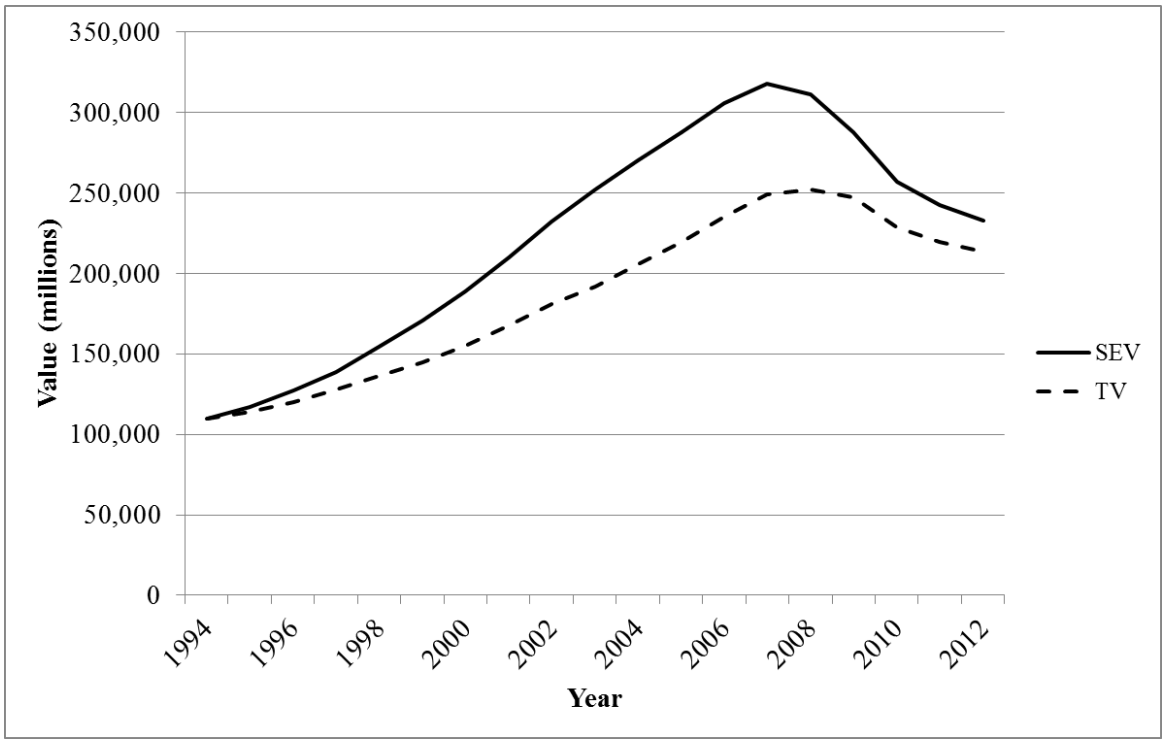


Figure 2: State Equalized Value and Taxable Value for Residential Properties in Michigan, 1994-2012



Source: State equalized values (SEV) and taxable values (TV) from 2000 through 2012 are from the State Tax Commission, Michigan Department of Treasury. The values from the previous years (1994-1999) are from the State Equalization Department, Michigan Department of Treasury.

Figure 3: Estimated Tax Expenditures from the Taxable Value Cap in the Property Tax in Michigan, Fiscal Years, 1999-2017