Estimates of the Total Cost and Distribution of Tax Relief Under State Funded Property Tax Circuit Breakers

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Abstract

This paper uses data from the 2006 American Community Survey to estimate the cost for state governments to fund three hypothetical property tax circuit breaker programs and a homestead exemption. The analysis finds that the circuit breaker programs cost between 5.2 and 7.8 percent of total property tax collections, similar to the cost of a $45,000 homestead exemption (7.6 percent). The two threshold circuit breakers target greater tax relief to the most heavily burdened households, whereas the sliding scale circuit breaker provides smaller benefits to almost all households. The greatest share of benefits is directed to low income households under the multiple threshold circuit breaker program, and all three circuit breakers make the property tax more progressive than under the homestead exemption. The circuit breakers provide median tax cuts between 25 and 100 percent larger than the homestead exemption for homeowners in the bottom quartile of the income distribution.

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INTRODUCTION

One of the central critiques of the property tax is that it does not take a taxpayer's ability to pay into consideration because changes in household income are not reflected in property tax bills. Circuit breakers directly address this problem by providing property tax relief to households based on both a household's income and its property tax bill. As household income rises, given a particular property tax bill, the amount of property tax relief gradually declines. Over the past four decades, many states have adopted property tax circuit breaker programs as a strategy for reducing property tax burdens.

As of 2008, 34 states (including Washington, D.C.) had implemented state funded circuit breaker programs. The proportion of households covered by these programs and the average amount of property tax relief vary widely by state. Consequently, the annual cost of these programs varies widely as well, from less than $1 million in Oklahoma to more than $1 billion in New Jersey. When costs are measured as a percent of total property tax collections, costs range from less than .01 percent in Oklahoma to 6.3 percent in Michigan (Bowman et al. 2009).

There are many different features of circuit breaker programs that affect their cost, including the type of formula used to calculate circuit breaker benefits, income ceilings, benefit limits, participation rates, and more. Simply comparing the total cost of different states' programs makes it difficult to separate differences in costs based on the basic formula type used from the differences in costs due to other program design features.

This paper addresses this problem by using data from the American Community Survey to estimate the cost of three hypothetical circuit breaker programs and a homestead exemption. This simulation applies to all states the same three circuit breakers; it is basically a national circuit breaker. The paper does not estimate the cost of existing state programs. However, the policy parameters used in the hypothetical circuit breakers are similar to those used in actual state programs.

DATA

The 2006 American Community Survey (ACS) is a nationally-representative survey conducted by the U.S. Census Bureau with data on 1,343,868 housing units,[1] and associated weights that allow researchers to produce totals for the entire U.S. population, individual states, and smaller geographic regions. The survey contains data on household income, property tax payments, monthly rent, age, property value, and other characteristics that normally determine circuit breaker benefits.

[1] This analysis dropped 180,525 housing units that are vacant and 23,402 housing units that are occupied without cash rent.

Property taxes are reported as a categorical variable in the ACS. There are 68 categories, with annual property taxes reported in ranges of $50 (up to $1,000), $100 ($1,000 - $4,999), $500 ($5,000 - $5,999), $1,000 ($6,000 to $9,999), and an open ended top category for all property tax payments above $10,000. Midpoints are assigned for each range, and a median property tax payment of $15,000 has been assigned to the 2.2 percent of homeowners that fall in the $10,000+ category. The $15,000 figure is based on guidance from tax and/or economic experts in states with high property tax burdens (Baer 2007).[2]

Using these midpoints, property taxes reported by respondents in the ACS on owner-occupied residential property accounted for 52 percent of total state and local property taxes collected in fiscal year 2006.[3] This seems reasonable since the total amount of property taxes includes taxes on rental properties, commercial and industrial properties, natural resources, and more. The ACS reports *net* property tax payments, so it includes any property tax relief that directly affects the property tax bill, such as homestead exemptions and circuit breaker programs that directly reduce the property tax bill. Baer (2007) shows that only six states have circuit breaker benefits that affect the property tax bills reported in the ACS, because most states administer circuit breakers as an income tax credit or rebate check, which do not directly reduce households' property tax bills.[4] The circuit breakers costs reported in this paper are slightly underestimated, because the cost of these six programs is not included in the calculations. However, these six states account for only 5.6% of the U.S. population.

Home property value is also reported as a categorical variable. There are 24 categories, with ranges of $5,000 (up to $40,000), $10,000 ($40,000 - $99,999), $25,000 ($100,000 - $199,999), $50,000 ($200,000 - $299,999), $100,000 ($300,000 - $499,999), $250,000 ($500,000 - $999,999), and a top category for property values above $1 million. Once

[2] The ACS provides mean property tax bills for households in the $10,000 category for each state. However, these mean tax payments are much higher than the median—for the median state, households in the top category paid an average of $19,735 in property taxes. Because of the right-hand tail in the distribution of property tax payments, using these mean values for all households in the top category would result in property tax estimates that are too high for the majority of households. Household income is reported as a continuous variable in the ACS. Because of the formulas used to determine circuit breaker benefits, combining households' true incomes with property tax estimates that are too high would result in inflated estimates of circuit breaker costs. Thus, I use the $15,000 figure used in Baer (2007).

[3] Total property taxes for FY2006 are from the U.S. Census, State and Local Government Finances: http://www.census.gov/govs/www/estimate.html.

[4] The six states include Idaho, Maryland, Nebraska, North Dakota, and Washington. In Montana, property tax reductions from the Property Tax Assistance Program and Disabled American Veterans Exemptions affect the property tax bills reported in the ACS, but the larger Elderly Homeowner Credit does not. Baer (2007) does not list these six states. Instead he lists 31 property tax relief programs that are *not* reflected in property tax bills; these programs are primarily circuit breakers. The six states noted above have circuit breakers listed in Bowman et al. (2009), but are not included in the list of programs in Baer (2007). There are no circuit breaker programs administered as income tax credits or rebate checks listed in Baer (2007). While the six states noted above all administer their circuit breakers as a property tax exemption or property tax credit, four states that also administer circuit breakers as property tax credits are included in Baer's list (Connecticut, Iowa, Utah, and Vermont). For a list of the administrative approaches used by each state, see Table 6.1 in Bowman et al. (2009).

again, midpoints are assigned for each range, and a median property value of $1.5 million has been assigned to the 2.4 percent of homeowners who fall in the top category.

Household income and monthly rent are both continuous variables in the ACS, although the rent payment variable has an open ended top category for each state. The ACS provides the mean rent payment for households in the top category for each state, and these were used for the 0.2 percent of renters who were included in the top category.

METHODOLOGY

Circuit Breakers

Circuit breakers can be divided into three categories: threshold, sliding scale, and quasi circuit breakers. A *threshold* circuit breaker provides a benefit for the portion of a claimant's property tax that exceeds a given percentage of income. States can use a single threshold percentage, or employ multiple threshold percentages that increase from the lowest income bracket to the highest. A *sliding scale* circuit breaker reduces property taxes by a given percentage depending on income, with the same percentage reduction in property taxes for all eligible taxpayers within an income bracket regardless of whether their tax bills are high or low. A *quasi circuit breaker* program uses multiple income brackets with benefits declining as income rises, but are not covered in this paper since benefits are determined without reference to a claimant's property tax bill, except that they typically cannot exceed the actual property tax paid. Table 1 illustrates how benefits are calculated under threshold and sliding scale circuit breaker programs.

Table 1: Benefit Determination Under Circuit Breaker Programs

	Low Income $10,000	**Moderate Income** $20,000	**Middle Income** $40,000
Tax Payments before Circuit Breaker			
Property Tax	$1,000	$2,000	$4,000
Tax as % of Income	10.0%	10.0%	10.0%
Single Threshold *Benefit offsets any property tax above 5% of income*			
Tax Due	$500	$1,000	$2,000
Tax Relief (Benefit)	$500	$1,000	$2,000
Tax as % of Income	5.0%	5.0%	5.0%
Multiple Threshold *Benefit offsets any property tax above 0% of first $5,000 of income; 2% for $5,001-$10,000; 4% for $10,001-$20,000; 6% for $20,001-$40,000*			
Tax Due	$100	$500	$1,700
Tax Relief (Benefit)	$900	$1,500	$2,300
Tax as % of Income	1.0%	2.5%	4.25%
Sliding Scale *Benefit = (Property Tax) x (Relief Percentage); Relief percent depends on income bracket*			
Relief Percentage	75%	50%	25%
Tax Due	$250	$1,000	$3,000
Tax Relief (Benefit)	$750	$1,000	$1,000
Tax as % of Income	2.5%	5.0%	7.5%

Source: Author's illustrative calculations

In 2008, five states used single threshold circuit breakers, nine used multiple threshold programs, ten used sliding scale programs, seven used quasi circuit breakers, and three used hybrid programs that included central features of more than one of these categories. These counts of circuit breakers are for elderly homeowners; they are different for renters and non-elderly households. More details about the different types of circuit breaker formulas are provided in Chapter 3 of Bowman et al. (2009) and Bowman (2008).

To estimate circuit breaker benefits for each household, a basic simulation was run in Stata that applied the following three circuit breaker formulas to each household's income and property tax payment as reported in the ACS.

- *Single Threshold:* The benefit offsets any property tax above 5 percent of household income. For example, a household with an income of $10,000 will receive a benefit to offset any property tax above $500. With a property tax bill of $800, this household would receive a circuit breaker benefit of $300.
- *Multiple Threshold:* The benefit offsets any property tax above:
    - 0 percent for the first $5,000 of income (i.e. no property tax liability)
    - 2 percent for income of $5,001 - $10,000
    - 4 percent for income of $10,001 - $20,000
    - 6 percent for income of $20,001 - $40,000
    - 8 percent for income of $40,001 - $60,000
    - 10 percent for income of $60,001 +

  These brackets are applied incrementally in the same way as a graduated income tax structure; thus a taxpayer whose income spans more than one bracket will only face the highest threshold percentage on that part of her income in the highest bracket. For example, a household with an income of $30,000 will receive a benefit to offset any property tax above $1,100: (0% x $5,000) + (2% x $5,000) + (4% x $10,000) + (6% x $10,000). With a property tax bill of $1,500, this household would receive a circuit breaker benefit of $400.
- *Sliding Scale:* The benefit equals a household's property tax bill multiplied by the following relief percentages, which vary by income bracket. The benefit is:
    - Property tax bill multiplied by 75 percent for first $10,000 of income
    - Property tax bill multiplied by 50 percent for income of $10,001 - $20,000
    - Property tax bill multiplied by 25 percent for income of $20,001 - $40,000
    - Property tax bill multiplied by 10 percent for income of $40,001 - $60,000
    - Property tax bill multiplied by 5 percent for income of $60,001+

  These brackets are not applied incrementally, so a small income increase could result in a large reduction in tax relief. For example, a household with an income of $19,000 and a property tax bill of $1,000 will receive a circuit breaker benefit for $500 ($1,000 x 50 percent). However, a household with an income of $21,000 and the same tax bill would receive a benefit for $250 ($1,000 x 25 percent).

With the two threshold formulas, only households whose property tax liabilities exceed a certain percentage of their income will qualify for benefits, because the taxpayer covers the entire tax bill up to the threshold. Under the sliding scale formula, all households that pay property taxes will receive a benefit regardless of whether their tax bills are high or low.

As discussed above, circuit breaker benefits for six states are already included in the net property tax variable reported in the ACS. For these states, the cost estimates in this paper are too low because the costs of existing circuit breaker programs are not included in the calculations. However, this is not a significant problem since most existing circuit breaker programs are small and inexpensive.[5]

The hypothetical formulas described above are similar to the actual formulas used in many states. The most important difference is that the formulas used in all states except West Virginia include income ceilings in their formulas, but they are intentionally excluded in this paper to illustrate the cost and distribution of benefits of circuit breakers in the absence of income ceilings. Because some of the three basic formulas described above may provide a greater share of benefits to upper income households, including income ceilings would make it difficult to separate differences in costs between the three basic formulas described above from differences due to income ceilings.

There are two primary reasons for excluding income ceilings. First, this paper attempts to estimate the cost of the three types of circuit breakers described above, and including income ceilings would obscure these differences since some types of formulas may provide a greater share of benefits to upper income households.

For single threshold circuit breakers, most states have threshold percentages between 3.5 and 5.0 percent of household income.

For multiple threshold programs, most states have a very low threshold of 0 to 1 percent for the lowest income bracket, with maximum incomes for that bracket between $3,000 and $9,000. The threshold for the highest income bracket is generally between 3.0 and 9.0 percent of household income. This top bracket normally covers households with incomes starting between $8,000 and $15,000. For most states, the highest income covered is between $20,000 and $30,000, although two states are around $45,000 and Michigan and Minnesota include incomes above $80,000.

For sliding scale programs, more than half of the states have a low income bracket that reduces property taxes 100 percent. In other states, the lowest income bracket normally has a relief percentage between 55 and 80 percent of the property tax bill. The household incomes covered by the lowest bracket normally cover household incomes up to between $10,000 and $28,000. The highest income bracket normally has a relief percentage between 10 percent and 30 percent. This top relief percentage generally covers households with incomes starting between $16,000 and $35,000, and ending between $20,000 and $40,000.

[5] Data on circuit breaker costs is provided for 14 states in Table 4.1 in Bowman et al. (2009). Only four of these states have programs that cost more than 2 percent of total property tax collections: Michigan, Minnesota, New Jersey, and Vermont. Since most existing circuit breakers have a limited number of eligible households and low participation rates, and many have small benefits, it is reasonable to assume that most programs are relatively inexpensive when compared to other types of property tax relief.

Circuit breaker programs administer property tax relief in different ways, including through income tax credits, separate rebate checks, property tax exemptions, and property tax credits. Because of these differences, in this paper the *benefit* refers to the amount of property tax relief a household receives under a circuit breaker or homestead exemption, regardless of whether it is provided as an income tax credit or property tax exemption, or to a homeowner or renter.

Homestead Exemption

Benefits from the homestead exemption were also estimated using a basic simulation in Stata. First, each household's effective tax rate before the homestead exemption was calculated by dividing their property tax bill by their home's property value. The value of the homestead exemption ($45,000) was then subtracted from the property value, and this lower property value was multiplied by the previously calculated effective tax rate to determine the tax bill after the homestead exemption. To calculate the benefit that the household receives from the homestead exemption, the tax bill after the homestead exemption was subtracted from the original tax bill reported in the ACS. After the costs of several different homestead exemptions were calculated, an exemption of $45,000 was chosen because it is close to the estimated cost of the two threshold circuit breakers.[6] As discussed above, households' property tax bills reported in the ACS already include any reductions due to homestead exemptions. Thus this paper estimates the cost of a national homestead exemption of $45,000 *in addition to* any existing state or local homestead exemptions.

Renters

While renters do not personally receive a property tax bill, they pay property taxes indirectly because landlords pass on some proportion of property taxes in the form of higher rent. Of 34 states with circuit breaker programs, 25 cover both owners and renters, 8 cover owners only, and 1 covers renters only. Because renters do not pay property taxes directly, it is necessary to estimate their taxes in order to determine circuit breaker benefits. In 23 states, taxes paid by renters are estimated by setting a property tax rent equivalent; that is, the percentage of rent that is assumed to be property tax. The most common figure is 20 percent, which is found in eight states (Bowman et al. 2009). Thus a renter with an annual rent of $10,000 would be assumed to have paid $2,000 in property taxes. The Minnesota Department of Revenue (2005) conducted a study that found that statewide the property tax as a share of rent averaged 11.7 percent, with 91 percent of rental units under 15 percent. However, there were large discrepancies based on the region and the number of units in the building; plus the property tax in Minnesota accounts for a smaller share of total state and local government revenues than in many other states.[7]

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[6] A $25,000 homestead exemption would cost the equivalent of 4.3 percent of total property tax collections. A $30,000 exemption would cost 5.2 percent, a $40,000 exemption would cost 6.8 percent, and a $50,000 exemption would cost 8.4 percent. All of these calculations assume a participation rate of 80 percent.

[7] Information on property tax as a share of state and local government revenues from the U.S. Census, State and Local Government Finances: http://www.census.gov/govs/www/estimate.html

Despite the empirical study in Minnesota, a property tax rent equivalent of 20 percent was chosen for this analysis because that is the figure most commonly used in the states with existing circuit breaker programs. Thus to calculate circuit breaker benefits for renters, each household's annual rent was multiplied by 20 percent, and then this figure was used as the household's implied property tax liability and used with the circuit breaker formulas discussed above. Because the homestead exemption reduces assessed values, renters are not eligible for this program.

Participation Rates

Finally, to provide more realistic cost estimates of the three circuit breakers and the homestead exemption it was necessary to consider the proportion of households that would participate in these programs. Participation rates in circuit breaker programs are low. A study in Maine found that only 41 percent of eligible households successfully applied for the state's circuit breaker program (Harkness 2006). Similarly, the Wisconsin Department of Revenue (2004) estimated that 43 percent of eligible households received circuit breaker benefits. A participation rate of fifty percent was assumed for two reasons. First, choosing a participation rate slightly higher than expected means that actual program costs are unlikely to exceed the estimates in this paper. Second, there are limited data about circuit breaker participation rates, and choosing 50 percent makes it easy for readers to adjust the estimated costs using alternative assumptions about participation rates. In practice, it is crucial that a circuit breaker program is accompanied by outreach efforts to ensure that those eligible for benefits are aware of the program (Bowman et al. 2009). Participation rates are much higher for homestead exemption programs, typically above 80 percent (Munimall 2004). Thus this analysis assumed a participation rate of 80 percent for the homestead exemption program.

RESULTS

The appendix provides estimated costs and the distribution of benefits for each property tax relief program by income decile.

Total Costs

The total estimated costs of the four programs are fairly similar, with the sliding scale circuit breaker costing less than the others. Table 2 shows that total costs range from $18.8 to $28.1 billion. Measured as a percent of total property tax collections, the estimates range from 5.2 to 7.8 percent of property tax revenues. Differences between the costs of these four programs should not be generalized beyond these particular plans, because different policy parameters would change the results. For example, a single threshold program that offsets any property tax above *four* percent of household income (instead of *five* percent) would cost 9.5 percent of total property tax collections.

Table 2: Estimated Cost of Four Property Tax Relief Programs (2006)

	Cost ($ Billions)	Cost as a Percent of Total Property Tax Collections
Single Threshold	26.1	7.3%
Multiple Threshold	28.1	7.8
Sliding Scale	18.8	5.2
Homestead Exemption	27.4	7.6

Note: Total state and local property tax collections in 2005-06 were $359.1 billion (State and Local Government Finances 2006).
Source: American Community Survey (2006)

Table 3 shows that for the single threshold circuit breaker, 27.4 percent of the total estimated cost is due to covering renters, while benefits for renters account for 36.9 percent of the total cost of the multiple threshold program and 40.9 percent of the sliding scale program. The ACS survey shows that 30.5 percent of households in the United States are renters. The costs of the four programs if only owners were eligible can be calculated by multiplying the estimates in Table 2 by the proportion of total costs to cover homeowners in Table 3.

Table 3: Proportion of Total Cost to Cover Housing Group (2006)

	Owners	Renters
Single Threshold	72.6%	27.4%
Multiple Threshold	63.1	36.9
Sliding Scale	59.1	40.9
Homestead Exemption	100.0	0.0

Source: American Community Survey (2006)

Distribution of Tax Relief by Income Quartile

Although the total costs for the four programs are similar, the distributions of benefits are very different. As Table 4 shows, the multiple threshold and sliding scale programs direct the greatest share of total benefits to lower income households, while upper income households receive a greater share of benefits under the homestead exemption.

Table 4: Share of Total Benefits Going to Indicated Income Quartile (2006)

Income Quartile	Household Income Range	Single Threshold	Multiple Threshold	Sliding Scale	Homestead Exemption
1	Up to $24,900	41.2%	52.7%	50.6%	14.7%
2	$24,901 - $48,100	23.2	28.5	24.7	23.2
3	$48,101 - $83,000	18.0	13.3	11.0	29.0
4	Above $83,000	17.7	5.5	13.7	34.0

Source: American Community Survey (2006)

Whereas 52.7 percent of total benefits under the multiple threshold program go to households in the bottom 25 percent of the income distribution, only 14.7 percent of total benefits under the homestead exemption program go to the bottom quartile. Similarly, 81.2 percent of total benefits go to the lower half of the income distribution under the multiple threshold program, while only 37.0 percent do so under the homestead exemption.

Eligibility Rates and Median Benefits by Income Quartile

Another important distinction between the four property tax relief programs are differences in the proportion of households that are eligible for relief and the median amount of property tax relief that those households receive. Total cost depends on both eligibility rates (see Table 5 on next page) and the median benefit among eligible households (see Table 6 on next page). Single threshold and multiple threshold circuit breakers restrict eligibility to households with property tax bills or rent payments above a certain percentage of household income. Consequently, these programs have much lower eligibility rates (33.7 and 38.4 percent respectively), but provide much greater property tax relief to those households that are eligible ($820 and $878). On the other hand, the sliding scale circuit breaker covers all renters and all homeowners that pay property taxes (4.0 percent of owners have zero property tax liability). Because benefits are given to 97.3 percent of households under the sliding scale program, the median benefit ($204) must be lower if total costs are to be comparable to the other property tax relief programs. Finally, the homestead exemption program covers all homeowners that pay property taxes, but excludes renters. Thus the homestead exemption has an eligibility rate (65.9 percent) and median tax relief ($391) that falls between those of the threshold and sliding scale circuit breaker programs.

Table 5: Eligibility Rates by Income Quartile (2006)

Income Quartile	Household Income Range	Single Threshold	Multiple Threshold	Sliding Scale	Homestead Exemption
1	Up to $24,900	69.0%	87.0%	95.6%	42.0%
2	$24,901 - $48,100	35.2	48.3	96.8	59.4
3	$48,101 - $83,000	18.8	14.3	97.8	74.6
4	Above $83,000	11.6	3.7	98.9	87.7
	All Quartiles	*33.7*	*38.4*	*97.3*	*65.9*

Source: American Community Survey (2006)

Table 6: Median Benefit for Eligible Households by Income Quartile (2006)

Income Quartile	Household Income Range	Single Threshold	Multiple Threshold	Sliding Scale	Homestead Exemption
1	Up to $24,900	$750	$912	$528	$345
2	$24,901 - $48,100	705	724	275	378
3	$48,101 - $83,000	1,050	1,090	120	401
4	Above $83,000	1,808	2,100	144	410
	All Quartiles	*820*	*878*	*204*	*391*

Source: American Community Survey (2006)

The reason most of the total cost of the two threshold circuit breakers goes to cover households with incomes below the national median is because far fewer upper income households are eligible for circuit breaker benefits, not because median benefits decline with household income. In fact, under the multiple threshold program, the median property tax reduction for the lowest quartile is $912, compared to $2,100 for the top quartile. However, 87.0 percent of households in the bottom quartile are eligible for relief, whereas only 3.7 percent of households in the top quartile would qualify.

On the other hand, under the sliding scale program eligibility rates are basically the same for all income quartiles. The reason that most of the total cost of the sliding scale circuit breaker goes to cover households with incomes below the national median is because median benefits are much higher for the lowest quartile ($528) than the highest quartile ($144).

Finally, the majority of the total cost of the homestead exemption program goes to cover households with incomes above the national median. The primary reason for this distribution of benefits is because homestead exemptions do not provide property tax relief to renters, and lower income households are much more likely to be renters (see Appendix Table 5). Even among homeowners, the homestead exemption provides a lower median property tax reduction to homeowners in the lowest quartile ($345) than higher income groups, because lower income households are more likely to have property values below $45,000 or to not pay property taxes at all.

Table 7 shows that all four programs provide the largest median percentage reductions in property taxes for lower income households. The "tax cut" for eligible renters is the decline in the property tax rent equivalent (i.e. 20 percent of rent constitutes property tax). Thus, a 50 percent decline in the property tax rent equivalent equals a 10 percent decline in rent. Because lower income households start with smaller gross tax bills, even a relatively small *dollar* reduction can result in a large *percentage* reduction. This is the case for both threshold programs and the homestead exemption.

Table 7: Median Tax Cut Percentage for Eligible Households by Income Quartile (2006)

Income Quartile	Household Income Range	Single Threshold	Multiple Threshold	Sliding Scale	Homestead Exemption
1	Up to $24,900	56.3%	81.9%	50.0%	40.0%
2	$24,901 - $48,100	29.6	36.1	25.0	32.7
3	$48,101 - $83,000	25.0	25.0	5.0	24.0
4	Above $83,000	23.3	19.7	5.0	12.9
	All Quartiles	*40.0*	*61.0*	*10.0*	*24.0*

Note: "Tax cut" for eligible renters is the decline in the property tax rent equivalent (20% of rent).
Source: American Community Survey (2006)

For example, under the multiple threshold circuit breaker, eligible households in the bottom quartile received a median benefit of $912 while those in the top quartile received $2,100 (Table 6). However, the median tax cuts for those quartiles were 81.9 percent and 19.7 percent (Table 7). The median cut for all quartiles under the multiple threshold program (61.0 percent) is heavily tilted towards the median reduction for the lowest quartile, because a greater share of lower income households are eligible for benefits. In other words, the median income for households eligible for benefits under the multiple threshold program is lower than the median income for the entire population.

The median tax cut for the sliding scale programs simply reflects the program's formula. For example, the median income for eligible households in the second quintile is $35,900 and thus qualifies for a 25 percent reduction in property taxes.

Under the homestead exemption, 63.0 percent of total benefits go to the upper half of the income distribution (Table 4). However, lower income homeowners still receive a much larger percentage cut in their property taxes than upper income owners (Table 7).

Differences between Homeowners and Renters

Table 3 showed that providing circuit breaker benefits to renters accounts for between 27.4 and 40.9 percent of the total costs for the three circuit breaker programs. While the cost of covering renters for the three circuit breakers is reasonably close to the share of renters in the total population, there are large differences in eligibility rates and median benefits between owners and renters. Renters are twice as likely as homeowners to qualify for circuit breaker benefits under the two threshold programs (Table 8). However, the median benefit to renters ($625) is a little more than half the median property tax reduction to homeowners ($1,100) under the single threshold program, and roughly 80 percent under the multiple threshold program ($800 and $1,004 respectively). A possible explanation for these differences in eligibility rates and median benefits is that renters have a greater ability to adapt to fluctuations in their income by moving, and thus can bring their rent payments in line with their income. However, when assuming that property taxes account for 20 percent of rent, a household would qualify for the single threshold circuit breaker if it paid more than 25 percent of its income in rent—not an unusually high share of income spent on rent, especially for lower income households.[8] As Table 9 shows, under the sliding scale circuit breaker, median benefits for renters ($324) are almost twice as generous as for homeowners ($165). This discrepancy in benefits between owners and renters is primarily because lower income households are more likely to be renters; the differences within income quartiles are much smaller.

Table 8: Differences in Eligibility Rates between Homeowners and Renters (2006)

Income Quartile	Household Income Range	Single Threshold		Multiple Threshold		Sliding Scale		Homestead Exemption	
		Owners	Renters	Owners	Renters	Owners	Renters	Owners	Renters
1	Up to $24,900	55.6%	80.6%	74.9%	97.6%	90.6%	100%	90.6%	0%
2	$24,901 - $48,100	32.6	39.5	41.7	59.4	94.9	100	94.9	0
3	$48,101 - $83,000	20.2	13.9	15.6	10.0	97.2	100	97.2	0
4	Above $83,000	12.6	4.1	4.1	0.6	98.8	100	98.8	0
	All Quartiles	*26.6*	*49.2*	*27.9*	*61.3*	*96.0*	*100*	*96.0*	*0*

Table 9: Differences in Median Benefits between Homeowners and Renters (2006)

Income Quartile	Household Income Range	Single Threshold		Multiple Threshold		Sliding Scale		Homestead Exemption	
		Owners	Renters	Owners	Renters	Owners	Renters	Owners	Renters
1	Up to $24,900	$930	$685	$914	$912	$437	$588	$345	N.A.
2	$24,901 - $48,100	990	470	954	556	231	324	378	N.A.
3	$48,101 - $83,000	1,175	585	1,215	590	112	137	401	N.A.
4	Above $83,000	1,900	760	2,170	890	152	132	410	N.A.
	All Quartiles	*1,100*	*625*	*1,004*	*800*	*165*	*324*	*391*	*N.A.*

Source: American Community Survey (2006)

[8] According 2006 ACS data, 61.2 percent of renters paid 25 percent or more of their household income in rent. In the lowest income quartile, 91.9 percent of renters exceeded the 25 percent threshold; 58.0 percent did so in the second quartile, 22.0 percent in the third, and 6.1 percent in the fourth quartile.

Table 10 shows median tax cuts for eligible homeowners separately from renters. For owners, the circuit breakers provide tax cuts between 25 and 100 percent larger than the homestead exemption for households in the bottom quarter of the income distribution. Both threshold programs are also able to provide larger tax cuts for higher income homeowners than the homestead exemption, because lower eligibility rates under the circuit breakers target larger amounts of tax relief to fewer households. Under the sliding scale program, homeowners above the bottom income quartile would receive smaller tax cuts than under the homestead exemption.

Table 10: Differences in Median Tax Cut Percentage between Homeowners and Renters (2006)

Income Quartile	Household Income Range	Single Threshold		Multiple Threshold		Sliding Scale		Homestead Exemption	
		Owners	Renters	Owners	Renters	Owners	Renters	Owners	Renters
1	Up to $24,900	61.0%	53.7%	80.5%	82.7	50.0%	50.0%	40.0%	N.A.
2	$24,901 - $48,100	36.1	22.4	41.1	31.6	25.0	25.0	32.7	N.A.
3	$48,101 - $83,000	27.5	16.7	26.9	16.3	5.0	5.0	24.0	N.A.
4	Above $83,000	23.7	13.1	20.0	10.7	5.0	5.0	12.9	N.A.
	All Quartiles	*38.7*	*41.7*	*53.4*	*68.3*	*5.0*	*25.0*	*24.0*	*N.A.*

Note: "Tax cut" for eligible renters is the decline in the property tax rent equivalent (20% of rent).
Source: American Community Survey (2006)

The median "tax cut" for eligible renters is more difficult to interpret, because it shows the decline in the property tax rent equivalent. To find the decline in rent, multiply the median "tax cut" in Table 10 by 0.2. Under the sliding scale program, the much larger median "tax cut" for all renters (25.0 percent) than all owners (5.0 percent) is because the median income for renters ($29,600) is much lower than for homeowners eligible for benefits ($60,400).[9]

[9] As noted above, 4.0 percent of homeowners do not pay property taxes. The median income for all owners (including those with zero property tax liability) is $59,900.

CONCLUSION

This paper examines the design of different types of circuit breakers to provide general insights about the cost to state governments and the distributional impact of these programs. Under the hypothetical formulas used in this paper, the three circuit breakers would cost between $18.8 and $28.1 billion nationally, which is between 5.2 and 7.8 percent of total property tax collections. One key finding is that policymakers interested in providing a small amount of property tax relief to almost all households should choose a sliding scale circuit breaker, while those more concerned with targeting greater tax relief to the most heavily burdened households should opt for a threshold circuit breaker. The paper also shows that all three circuit breakers make the property tax more progressive than under a homestead exemption with a similar cost. Because homestead exemptions do not cover renters, only 37.0 percent of total benefits are directed to households with incomes below the national median in this simulation. For comparison, the circuit breakers direct between 64.3 and 81.2 percent of total benefits to these households. When solely looking at homeowners, the circuit breakers provide tax cuts between 25 and 100 percent larger than the homestead exemption for households in the bottom quarter of the income distribution.

The approach used in this paper could be used in future research to explore how different circuit breaker formulas affect the cost and distribution of benefits. For example, using different threshold percentages under a threshold circuit breaker or different relief percentages under a sliding scale program could significantly change the findings. Changing income brackets would also affect the results. Other features of circuit breaker design that are often included in state programs would also affect the findings, including income ceilings, restrictions on maximum benefits, and co-payment requirements. Finally, it would be useful to conduct similar simulations at the state level since total costs and the distribution of tax relief will vary from state to state.

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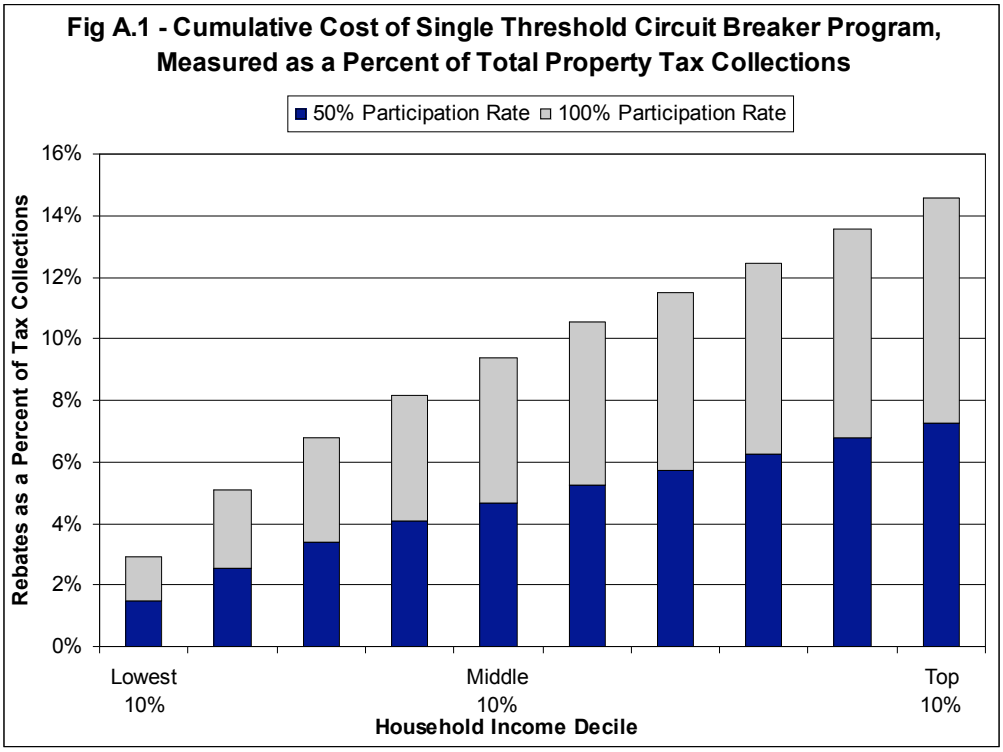
APPENDIX

Single Threshold Circuit Breaker

Policy: Benefit offsets any property tax above 5% of income; no income ceiling.



Source: American Community Survey (2006); State and Local Government Finances (2006)

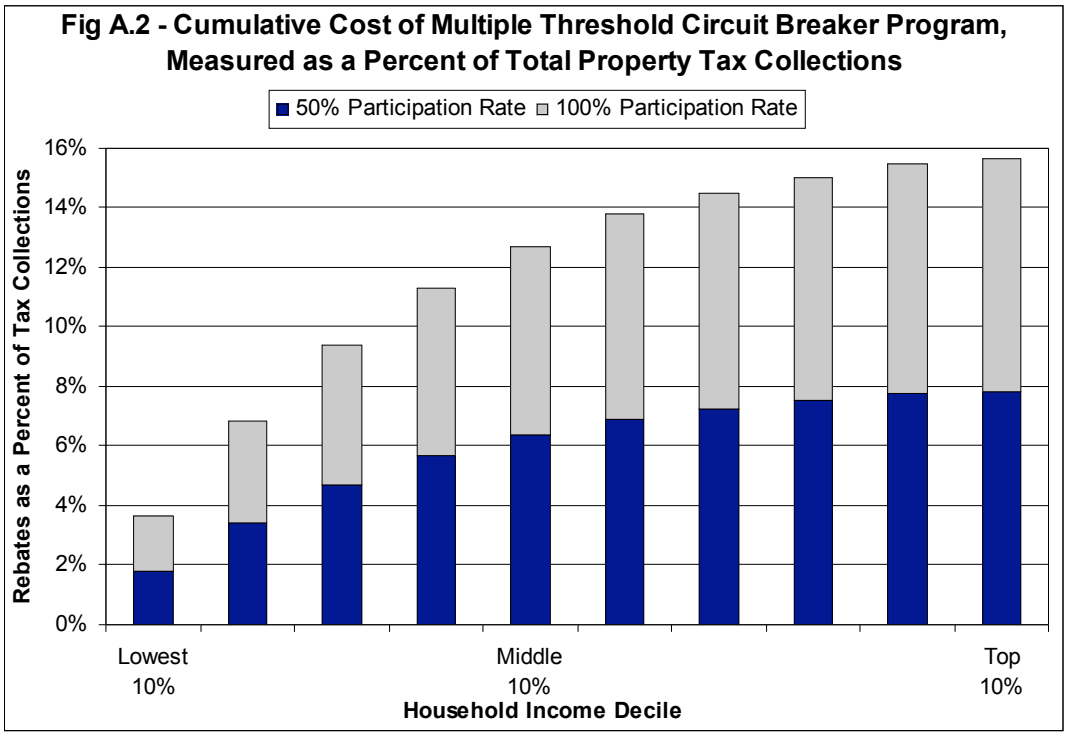
Table A.1 - Eligibility Rates and Median Benefits by Income Decile (2006)

		Percent of Households that are Eligible for Benefits			Median Benefit Among Eligible Households		
Decile	Income Range	Owners	Renters	Total	Owners	Renters	Total
1	Up to $11,900	68.6%	86.3%	79.5%	$955	$832	$860
2	$11,901 - $20,190	51.8	79.8	66.0	905	590	672
3	$20,191 - $29,160	41.8	61.6	50.4	945	484	645
4	$29,161 - $38,000	34.6	41.5	37.3	975	452	680
5	$38,001 - $48,100	28.1	26.0	27.4	1,010	515	830
6	$48,101 - $60,000	23.7	17.3	21.9	1,095	580	945
7	$60,001 - $74,100	18.7	11.3	17.1	1,200	575	1,050
8	$74,101 - $94,000	15.9	7.5	14.5	1,425	730	1,330
9	$94,001 - $130,000	14.5	4.7	13.3	1,525	795	1,500
10	Above $130,001	9.6	1.1	8.9	3,225	660	3,117
	Total	26.6	49.2	33.7	1,100	625	820

Source: American Community Survey (2006)

Multiple Threshold Circuit Breaker

Policy: Benefit offsets any property tax above 0% of first $5,000; 2% for $5,001-$10,000; 4% for 10,001-$20,000; 6% for $20,001-$40,000; 8% for $40,001-$60,000; 10% for $60,001+. The brackets are applied incrementally, like a graduated income tax.



Source: American Community Survey (2006); State and Local Government Finances (2006)

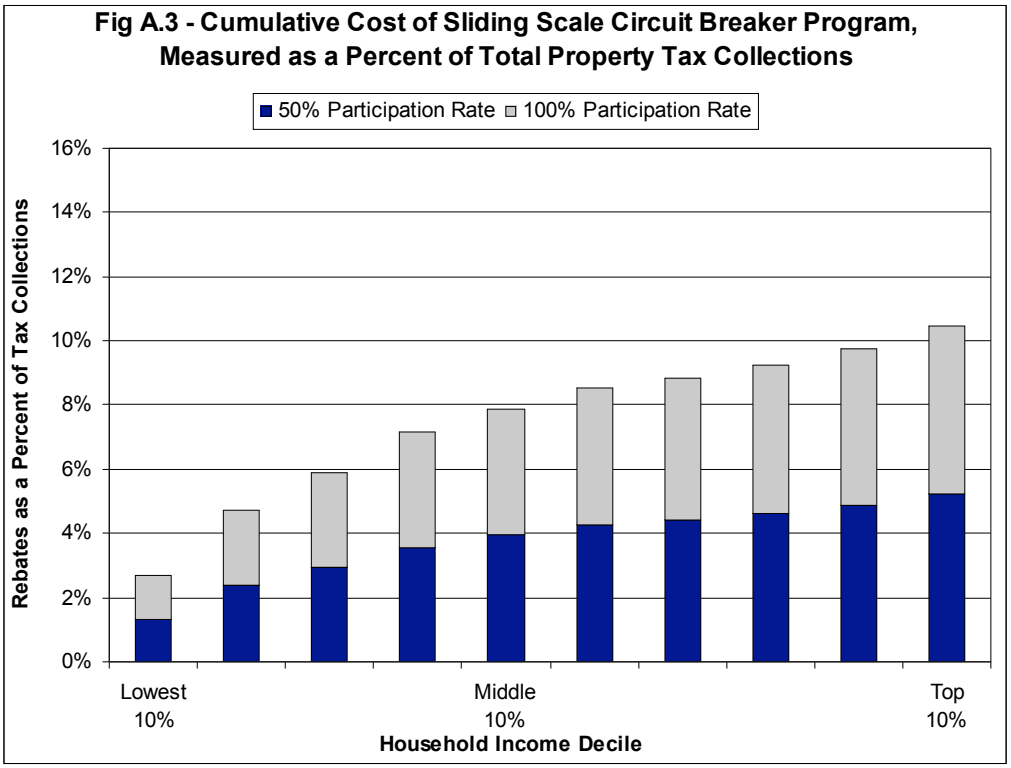
Table A.2 - Eligibility Rates and Median Benefits by Income Decile (2006)

Decile	Income Range	Percent of Households that are Eligible for Benefits			Median Benefit Among Eligible Households		
		Owners	Renters	Total	Owners	Renters	Total
1	Up to $11,900	85.2%	99.5%	94.0%	$918	$960	$960
2	$11,901 - $20,190	73.8	97.3	85.6	906	908	906
3	$20,191 - $29,160	58.9	88.8	71.9	930	700	772
4	$29,161 - $38,000	45.4	65.5	53.3	950	520	694
5	$38,001 - $48,100	32.6	35.6	33.6	998	520	780
6	$48,101 - $60,000	21.9	15.4	20.1	1,094	542	950
7	$60,001 - $74,100	12.9	5.5	11.4	1,379	620	1,250
8	$74,101 - $94,000	7.9	2.0	7.0	1,530	940	1,500
9	$94,001 - $130,000	4.4	0.5	4.0	4,700	800	2,710
10	Above $130,001	2.4	0.0	2.2	2,600	N.A.	2,600
	Total	27.9	61.3	38.4	1004	800	878

Source: American Community Survey (2006)

Sliding Scale Circuit Breaker

Policy: Benefit equals property tax multiplied by the relief percentage, which varies by income bracket. The relief percentages are: 75% for $0-$10,000; 50% for $10,001-$20,000; 25% for $20,001-$40,000; 10% for $40,001-$60,000; 5% over $60,000.



Source: American Community Survey (2006); State and Local Government Finances (2006)

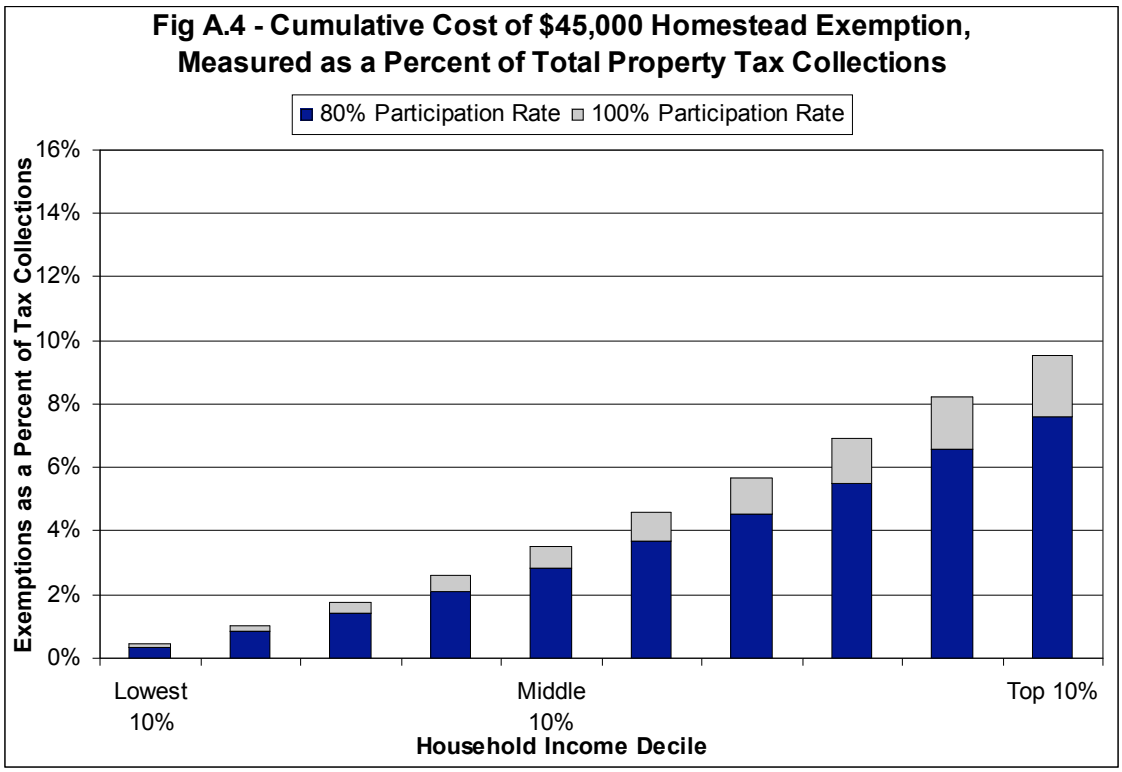
Table A.3 - Eligibility Rates and Median Benefit by Income Decile (2006)

Decile	Income Range	Percent of Households that are Eligible for Benefits			Median Benefit Among Eligible Households		
		Owners	Renters	Total	Owners	Renters	Total
1	Up to $11,900	89.1%	100.0%	95.8%	$618	$720	$693
2	$11,901 - $20,190	90.8	100.0	95.5	487	600	576
3	$20,191 - $29,160	92.8	100.0	96.0	287	354	318
4	$29,161 - $38,000	94.7	100.0	96.8	312	384	360
5	$38,001 - $48,100	95.6	100.0	97.0	165	199	180
6	$48,101 - $60,000	96.6	100.0	97.5	155	180	165
7	$60,001 - $74,100	97.4	100.0	97.9	87	100	92
8	$74,101 - $94,000	98.1	100.0	98.4	102	108	102
9	$94,001 - $130,000	98.7	100.0	98.9	127	132	127
10	Above $130,001	99.0	100.0	99.1	197	156	192
	Total	96.0	100.0	97.3	165	324	204

Source: American Community Survey (2006)

Homestead Exemption

Policy: First $45,000 of assessed value is exempt from property taxes.



Source: American Community Survey (2006); State and Local Government Finances (2006)

Table A.4 - Eligibility Rates and Median Benefit by Income Decile (2006)

Decile	Income Range	Percent of Households that are Eligible for Benefits			Median Benefit Among Eligible Households		
		Owners	Renters	Total	Owners	Renters	Total
1	Up to $11,900	89.1%	0.0%	34.3%	$329	N.A.	$329
2	$11,901 - $20,190	90.8	0.0	44.9	346	N.A.	346
3	$20,191 - $29,160	92.8	0.0	52.3	370	N.A.	370
4	$29,161 - $38,000	94.7	0.0	57.7	376	N.A.	376
5	$38,001 - $48,100	95.6	0.0	64.3	390	N.A.	390
6	$48,101 - $60,000	96.6	0.0	70.0	401	N.A.	401
7	$60,001 - $74,100	97.4	0.0	76.7	401	N.A.	401
8	$74,101 - $94,000	98.1	0.0	81.8	405	N.A.	405
9	$94,001 - $130,000	98.7	0.0	86.7	410	N.A.	410
10	Above $130,001	99.0	0.0	90.9	410	N.A.	410
	Total	96.0	0.0	65.9	391	N.A.	391

Source: American Community Survey (2006)

Table A.5 - Homeownership Status by Income Decile (2006)			
Decile	**Income Range**	**Percent Owners**	**Percent Renters**
1	Up to $11,900	36.8%	58.4%
2	$11,901 - $20,190	48.5	48.2
3	$20,191 - $29,160	54.9	42.4
4	$29,161 - $38,000	59.5	38.3
5	$38,001 - $48,100	66.0	32.2
6	$48,101 - $60,000	71.4	27.2
7	$60,001 - $74,100	77.9	21.0
8	$74,101 - $94,000	82.7	16.5
9	$94,001 - $130,000	87.3	12.0
10	Above $130,001	91.2	8.3
	Total	67.5	30.5

Source: American Community Survey (2006)

Table A.6 - Percent of Circuit Breaker Benefits Going to Indicated Decile				
Income Decile	**Single Threshold**	**Multiple Threshold**	**Sliding Scale**	**Homestead Exemption**
1	20.2%	23.3%	25.6%	4.7%
2	14.7	20.5	19.7	6.3
3	11.7	16.4	10.9	7.6
4	9.6	12.1	12.0	8.7
5	8.1	8.9	7.1	9.7
6	8.0	7.0	6.2	11.4
7	6.5	4.4	3.0	11.2
8	6.9	3.5	3.7	12.9
9	7.5	2.9	4.7	13.8
10	6.8	1.1	7.1	13.8

Source: American Community Survey (2006)