INDEPENDENT FISCAL OFFICE

December 5, 2017

The Honorable Jim Cox
Pennsylvania House of Representatives
209 Ryan Office Building
Harrisburg, PA 17120

Dear Representative Cox:

This letter responds to your request for estimates regarding school property taxes paid by Pennsylvania homeowners in the following age groups: (1) 60 or older, (2) 65 or older and (3) 70 or older. The relevant data are not collected by state, county or municipal governments; therefore, the Independent Fiscal Office (IFO) utilized survey data from the U.S. Census Bureau to make estimates. Summary bullet points regarding the data source and methodology are included at the end of this letter. Additional details are available in the enclosed memo.

According to the analysis, owner-occupied households with an owner or spouse age 60 or older constituted approximately 46 percent of all owner-occupied households in Pennsylvania (see Table 1). The share declines to 33 percent for the age 65 or over age group and drops to 22 percent for the age 70 or older group.

Table 1
Household and Property Tax Shares by Age Group

Age Group[1]	Household Share[2]	Property Tax Share[2]
60 or over	45.5%	43.8%
65 or over	32.9	31.3
70 or over	21.9	20.3

[1]Age groups are based on the age of the "reference person" (person 1) or that person's spouse, whoever is older.
[2]Represents the share of owner-occupied households.

Source: 2016 American Community Survey 1-Year Public Use Microdata Survey (PUMS), U.S. Census Bureau. Computations by the IFO.

Additional IFO analysis of the survey data for the referenced age groups suggests that the shares of property tax paid are lower than the respective shares for the number of households (see Table 1). For example, while the age 60 or over age group constitutes nearly 46 percent of owner-occupied households paying property taxes, that group is responsible for a slightly lower share of property taxes on owner-occupied properties. The difference is attributable to a lower average property tax for this age group compared to the average for all owner-occupied properties. The data indicate similar results for the 65 or over and 70 or over age groups.[1]

For FY 2015-16, data published by the Pennsylvania Department of Education (PDE) reveal that school districts received $13.7 billion in revenue from the property tax. This amount includes current and interim collections, Act 1 property tax reduction allocations (from slots proceeds) and delinquent collections. Based on the collections reported by PDE and the results of a prior IFO analysis, the estimate for school property taxes associated with owner-occupied properties is $7.7 billion.[2] Table 2 displays detail regarding collections from owner-occupied properties by age. The estimates utilize the property tax share referenced in Table 1.

Table 2
FY 2015-16 School Property Taxes on Owner-Occupied Properties

Source	All Ages	Age 60+	Age 65+	Age 70+
Current and Interim	$6,859	$3,004	$2,147	$1,392
Act 1 Allocations	530	232	166	108
Delinquent Collections	307	135	96	63
Total	7,696	3,371	2,409	1,563

Note: dollar amounts in millions. Age groups are based on the age of the "reference person" (person 1) or that person's spouse, whoever is older. See Table 1.

Source: Pennsylvania Department of Education. Computations by the IFO.

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[1] The enclosed background memo contains a table showing the distribution of real estate taxes by amount paid for all homeowners and for the age groups included in this analysis (60 or over, 65 or over and 70 or over).

[2] Letter to Representative Francis X. Ryan, November 6, 2017. The prior analysis found that approximately 54 percent of current and interim school property taxes are collected are from homestead properties. By definition, all of the Act 1 allocations are attributable to homesteads. This analysis assumes that 54 percent of delinquent collections are from homestead properties and that delinquency patterns are consistent across age groups. In this analysis, the terms "homestead property" and "owner-occupied property" are used interchangeably. See http://www.ifo.state.pa.us/Resources/Documents/SR2017-05.pdf for the prior analysis.
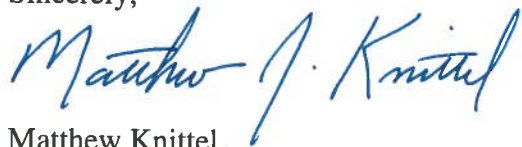
Notes on Data Sources and Methodology

The estimates in this analysis are based on the 2016 American Community Survey (ACS) 1-Year Public Use Microdata Survey (PUMS) database provided by the U.S. Census Bureau. Additional detail displaying the IFO's tabulations of the survey data and a description of the results are available in the background memo enclosed with this letter. The following points should be noted regarding the survey and the data extracted from it:

- Survey respondents were instructed to report real estate taxes paid on their primary home. The taxes reported are not limited to those levied by school districts.

- The results are significant at the 90th percent confidence level. The tabulations in the background memo include information that allows one to easily calculate the upper and lower bounds of the confidence interval for each data point.

- The PUMS data contain ranges of real estate taxes paid instead of actual real estate taxes paid. All surveys were completed in 2016, but the survey asks respondents to record the past 12 months of the property taxes paid, which includes some 2015 data.

- Results will differ based on the 1-Year PUMS data versus the 5-Year PUMS data. For example, this analysis uses the 2016 1-Year survey to estimate that households in the age 65 or over category constitute 32.9 percent of all Pennsylvania owner-occupied households. However, a November 6, 2017 letter uses the 2015 5-Year survey and estimates the share to be 29.3 percent. Part of the difference is attributable to the use of different surveys, which was dictated by the need to obtain county-level data for the November 6th letter. Also, this analysis includes a household in the age 65 or over group if either the homeowner or the spouse is in that age bracket, which should result in a slightly higher estimate.

I hope you find this information useful. Consistent with IFO policy, this letter and the enclosure will be posted to the office's website no later than the third business day following transmittal. Please do not hesitate to contact me if you have any questions or comments.

Sincerely,

Matthew Knittel
Director, Independent Fiscal Office

Enclosure

To:	Matthew Knittel, Director
	Mark Ryan, Deputy Director
From:	Jesse Bushman, Analyst
Date:	December 4, 2017
Subject:	Technical Background for the Analysis of Pennsylvania Resident-Owned Homes by Age of Homeowner and Real Estate Tax Paid

This memo is in response to a request to provide technical background on the data and methodology used to estimate the real estate taxes paid by Pennsylvania homeowners ages 60 or older, 65 or older and 70 or older. The American Community Survey (ACS) conducted by the U.S Census Bureau was used to provide the requested data. The following sections address technical details regarding the ACS and also summarize the Independent Fiscal Office's use and tabulations of the survey data.

I. Introduction to ACS PUMS Data

The ACS is an ongoing survey conducted by the U.S. Census Bureau. Each year, the Census Bureau surveys millions of U.S. residents in order to provide government agencies, nongovernment organizations, businesses, educators, journalists and the general public with broad social, economic, housing and demographic information for various geographic areas throughout the United States and Puerto Rico. More specifically, data collected includes both population data such as age, ancestry, disability, education, health insurance, income, occupation and language, as well as housing data such as number of bedrooms, computer and internet use, various household costs (e.g., rent/mortgage, real estate taxes) and year the structure was built.[1] The ACS has now replaced the decennial census "long-form" that was last used during the 2000 decennial census.[2]

While the Census Bureau produces thousands of ACS data tabulations on its website, there are occasions when a data user needs a tabulation that was not produced within publicly released tables. As a result, the Bureau provides a sample of the raw data it collects so that data users can

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[1] See: U.S. Department of Commerce, Census Bureau, "American Community Survey Information Guide," https://www.census.gov/content/dam/Census/programs-surveys/acs/about/ACS_Information_Guide.pdf.

[2] Ibid. Every 10 years, the Census Bureau conducts a decennial census of the entire United States in order to obtain a population count for the U.S., all states, counties, municipalities and neighborhoods. Prior to the 2010 Census, the Census Bureau used a "short-form" for most individuals to collect basic age, race and demographic data and a "long-form" for randomly selected individuals to gather more detailed information. The ACS replaces the long-form and samples a small segment of the population every year rather than just every ten years.

create their own tabulations.[3] These raw data are released as one-year and five-year Public Use Microdata Sample (PUMS) data files. For the purposes of this project, the 2016 one-year PUMS data (most recent one-year data available) are used.

In order for the PUMS data to be relevant for the user, they need to be able to be applied to the population of households and persons as a whole. The Census Bureau assists in this process by adding a "weight" to each record that indicates how many people or households each respondent's answers represent.[4] The Bureau ensures that (1) if the weights applied to each "person record" are summed, the total equals the estimated population of the U.S. and (2) if all Pennsylvania person records' weights are summed, they equal the estimated population of Pennsylvania. The same is true for household records. The household weights for all U.S. records sum to the estimated number of U.S. households and the weights for the Pennsylvania records sum to the estimated number of Pennsylvania households.

For this research project, 37,600 records within the one-year 2016 PUMS data file were Pennsylvania resident-owned homes where the homeowner paid real estate taxes on the residence when the survey was completed. These records had weights totaling 3,344,084 (+/- 24,588), which represents an estimate of the total number of resident-owned households in Pennsylvania that paid real estate taxes in 2016.

II. Tabulations Using ACS PUMS Data

The PUMS data were used to produce the tabulations in Tables 1 and 2 on the next page. Table 1 presents the 2016 number of resident-owned homes by the homeowners' age group and the amount paid in real estate taxes within set ranges. Table 2 is a summary of Table 1 by percentages instead of a count of households. The PUMS data contain ranges of real estate taxes paid instead of actual real estate taxes paid to prevent confidential information from being released about individual survey respondents.

Please note that Table 1 contains the number of households within each age and real estate taxes paid groups along with a plus or minus number listed. The data are statistically significant at the 90th percent confidence level. The plus or minus number represents the adjustments to the point estimate that are necessary to compute the confidence interval. For example, Table 1 lists the number of Pennsylvania resident-owned homes with homeowners age 70 or older as 732,072 +/- 10,671. This means that the actual number of resident-owned homes with homeowners age 70 or older has a 90 percent chance of falling between 721,401 and 742,743. These confidence intervals should be viewed in conjunction with the actual point estimates listed in Table 1.

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[3] The Census Bureau uses a multi-tiered approach to ensure that the raw data released by the Bureau does not compromise the privacy of individual survey respondents. More information on this process can be found at following website: Census Bureau, American Community Survey, "Confidentiality of PUMS," https://www.census.gov/programs-surveys/acs/technical-documentation/pums/confidentiality.html.

[4] More information about how the Census Bureau calculates these weights can be found at: U.S. Department of Commerce, Census Bureau, "American Community Survey Accuracy of the Data (2016)," https://www2.census.gov/programs-surveys/acs/tech_docs/pums/accuracy/2016AccuracyPUMS.pdf.

Table 1

Number of Pennsylvania Resident-Owned Homes

By Real Estate Taxes Paid and Age of Homeowner

Tax Paid	Homeowner Age 60+ Years			Homeowner Age 65+ Years		
	Households	+/-[1]	Share[2]	Households	+/-[1]	Share[2]
$1 - $999	245,216	8,402	50.5%	180,355	7,083	37.1%
$1,000 - $1,999	335,130	11,408	46.5	247,741	10,054	34.4
$2,000 - $2,999	287,471	8,767	47.5	211,125	7,092	34.9
$3,000 - $3,999	228,571	9,204	44.8	163,525	7,152	32.0
$4,000 - $4,999	148,049	8,261	43.3	105,282	6,259	30.8
$5,000 +	275,806	8,884	40.5	191,455	7,095	28.1
Total	1,520,243	18,329	45.5	1,099,483	13,295	32.9

Tax Paid	Homeowner Age 70+ Years			Homeowner All Ages		
	Households	+/-[1]	Share[2]	Households	+/-[1]	Share[2]
$1 - $999	127,945	5,754	26.4%	485,554	11,769	100.0%
$1,000 - $1,999	165,889	7,381	23.0	721,138	16,951	100.0
$2,000 - $2,999	145,296	5,831	24.0	604,623	12,141	100.0
$3,000 - $3,999	105,152	5,698	20.6	510,474	11,827	100.0
$4,000 - $4,999	70,045	5,444	20.5	341,686	11,215	100.0
$5,000 +	117,745	5,829	17.3	680,609	12,233	100.0
Total	732,072	10,671	21.9	3,344,084	24,588	100.0

[1] This represents the 90th percent confidence interval.

[2] The percentage of total households in the specified property tax range that fall into the specified age

Source: 2016 American Community Survey 1-Year Public Use Microdata Sample Database, https://www.census.gov/acs. Computations by the Independent Fiscal Office.

Table 2

Percent of Pennsylvania Resident-Owned Homes

By Real Estate Taxes Paid and Age of Homeowner[1]

Tax Paid	Homeowner Age 60+ Years	Homeowner Age 65+ Years	Homeowner Age 70+ Years	Homeowner All Ages
$1 - $999	16.1%	16.4%	17.5%	14.5%
$1,000 - $1,999	22.0	22.5	22.7	21.6
$2,000 - $2,999	18.9	19.2	19.8	18.1
$3,000 - $3,999	15.0	14.9	14.4	15.3
$4,000 - $4,999	9.7	9.6	9.6	10.2
$5,000 +	18.1	17.4	16.1	20.4
Total	100.0	100.0	100.0	100.0

[1] The data presented in this table are computed based on the point estimates in Table 1. The confidence intervals are not reflected in this table.

Source: 2016 American Community Survey 1-Year Public Use Microdata Sample Database, https://www.census.gov/programs-surveys/acs/. Computations by the IFO.

III. Homeowners and Age of Homeowners

The ACS does not formally ask survey respondents if their residence is owned or rented. However, it directs survey respondents to answer the following question if the respondent "…OWNS or IS BUYING this house, apartment, or mobile home: …What are the annual real estate taxes on THIS property?" It can be reasonably assumed that anyone answering this question is the property owner and so any Pennsylvania survey with a response to this question was assumed to be a resident-owned home.[5] While the respondent is directed to enter a specific dollar amount, the Census Bureau does not release these specific dollar values within the PUMS data in order to preserve the confidentiality of the survey respondent. Instead, the Bureau recodes the values in a series of dollar ranges (e.g., $1 - $49, $50-$99, $100-$149, etc.). The survey responses were then regrouped by the Independent Fiscal Office into six categories ($1 - $999; $1,000 - $1,999; $2,000 - $2,999; $3,000 - $3,999; $4,000 - $4,999 and $5,000+).

The next step was to determine which resident-owned homes had homeowners that were age 60 or older, 65 or older and 70 or older. For this step, if either the "reference person" or his or her spouse was in any of these age categories, the homeowner was considered to be in those age categories. The reference person is "person 1" on the ACS survey. The ACS survey states: "Person 1 is the person living or staying here in whose name this house or apartment is owned, being bought, or rented. If there is no such person, start with the name of any adult living or staying here."

IV. Statistical Error

Since the PUMS data are survey data, the point estimates found by summing the Census Bureau defined weights have two types of error called sampling error and nonsampling error.[6, 7] Sampling error is the error in the data that arises due to sampling the population instead of including all of the population. While estimates from randomly sampled data should be close to the actual value, there will always be some error. Statistics allows for researchers to measure this error to a particular degree of certainty. For this project, this error is measured using 90th percent confidence intervals. That is, one can be 90 percent certain that the true population value falls between two values (commonly called the lower bound and upper bound of the confidence interval). The calculation of confidence intervals for this project uses the "replicate weights" method as described by the Census Bureau.[8]

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[5] Of the 37,600 survey records listed in the 2016 PUMS data file from Pennsylvania that contained a response to this question, 501 of them indicated that there is no property tax on their residence. Due to the usual nature of this response, these 501 records were removed from the data.

[6] The Census Bureau defined weights are discussed in section I of this attachment.

[7] Nonsampling error can include things like data entry and coding errors, ambiguous survey questions, not surveying a truly random sample, etc. Since nonsampling error cannot typically be measured quantitatively, it is not covered in depth here. However, the Census Bureau does explain ways in which it attempts to minimize nonsampling error throughout many of its documentation reports found at its website.

[8] Please see U.S. Department of Commerce, Census Bureau, "American Community Survey Accuracy of the Data (2016)," https://www2.census.gov/programs-surveys/acs/tech_docs/pums/accuracy/2016AccuracyPUMS.pdf, for more details on the calculation on sampling and nonsampling errors and the calculation of confidence intervals.