

The Fiscal Implications Of Pennsylvania's Aging Population



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The Fiscal Implications of Pennsylvania's Aging Population

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In this article, the authors examine issues created by Pennsylvania's aging population and its exemption of retirement income from the individual income tax. They argue that this situation is increasingly untenable and that policymakers need to consider a change.

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for findings and any errors in this paper rests with the authors and not Carnegie Mellon University or the IMF.

population will be 20.2 percent.² Second, there have been gains in life expectancy. Regarding life expectancy, in 1950 a 50-year-old in the United States would on average live 27 more years, but in 2007 a 50-year-old in the United States would on average live 33 more years.³

The variation among the states in these demographic changes is even more startling. Pennsylvania's population is one of the oldest among the states. By 2030 the Census Bureau projects that Pennsylvania's population will be 12.7 million, compared with a 2000 population of 12.2 million. In 2000, 15.8 percent of Pennsylvania's population was over age 65, but in 2030, 2.9 million residents, or 22.8 percent, are projected to be 65 years of age or older. As Pennsylvania's population ages, the need for services for the elderly, especially for long-term care and health-related programs, will grow, while the contribution of the elderly to state revenue will be smaller because there will be relatively fewer seniors with market income, and relatively more whose income is both smaller because of retirement and not subject to tax because retirement income is tax free under Pennsylvania tax law.

Most recent national commentaries about the impact of these shifting demographics have focused on the implications for federal spending for the underfunded Medicare and Medicaid programs. Most state commentaries have focused on the adequacy of state and local public retirement systems to meet future defined benefit obligations or on patterns of tax payments of the elderly and non-elderly. While there are several relatively recent papers on state-by-state tax treatment of the elderly, there are no state-specific studies examining how favorable tax treatment of the elderly and their attending service needs have both affected state budgets.⁴ Pennsylvania's changing demographics and the implications of providing long-term care have attracted the

"Those who do not know history are doomed to repeat it."

— Edmund Burke

I.A. Introduction and Summary

It is well known that the demography of the United States is changing, with adults living longer because of improvements in medical science and lifestyle changes. In 1980 the median age in the United States was 30, while in 2010 it was 37.2 — an increase of 24 percent in just 20 years.¹ Regarding the proportion of the U.S. population 65 years of age or older, the 1980 census reported that 11.3 percent was elderly or seniors, while in 2010 that proportion had grown to 13 percent — a 15 percent increase. Moreover, the Census Bureau projects that by 2030 the elderly proportion of the U.S. population will be 19.3 percent, and by 2050 the elderly proportion of the U.S.

²See U.S. Census Bureau, "The Next Four Decades: The Older Population in the United States: 2010 to 2050" (May 2010).

³See Population Reference Bureau, 22 "Today's Research on Aging" (August 2011), at 1.

⁴See Barbara Edwards and Sally Wallace, "State Income Tax Treatment of the Elderly," 24 *Pub. Budgeting and Finance* 2 (2004), at 1-20, for state-by-state microsimulation analysis of preferential tax treatment of the elderly. The authors find that the median state treatment of the elderly in 1999 resulted in a 33 percent lower effective tax rate than that on working couples. Remarkably, while most states engage in preferential tax treatment of the elderly, some states (Maine, Nebraska,

(Footnote continued on next page.)

¹See U.S. Census Bureau, "Population: Estimates and Projections by Age, Sex, Race/Ethnicity," 2012 statistical abstract.

attention of elected officials.⁵ However, there appears to be a disconnect between those who research state tax policies toward the elderly and those who research the budgetary implications of a rapidly aging and increasingly dependent population.

This report focuses on how Pennsylvania's proportional tax system, because of the strict uniformity clause in the Pennsylvania Constitution, puts pressure on personal income tax receipts, since constitutionally permissible legislative policy has since 1971 exempted all retirement income from personal income taxation. On the other hand, public service quantities and especially the prices of some services for the elderly have been disproportionately growing. Sluggish long-term personal income tax revenue collections coupled with rapidly rising healthcare costs thus create a long-term structural imbalance or actual deficit in the state's budget. Those contradictory pressures make balancing the state's budget difficult and create taxpayer uncertainty.

Generally, the annual deficit or surplus in Pennsylvania's general fund is the difference, on an accrual basis across year t , between general fund revenue, R_t , and general fund expenditures, E_t :

$$\text{Deficit}_t = R_t - E_t \quad [1]$$

where $R_t = \text{Tax}_t + \text{Fees}_t + \text{Transfers}_t + \Delta \text{Net Worth}_t$ [2]

and $\text{Tax}_t = \sum t_{ij} \times \text{Tax Base}_{ij}$, for the j 'th tax base [3]

If the time rate of change of revenue, especially personal income tax revenue ($t_{ip} \times \text{Tax Base}_{ip}$), dT_{ip}/dt , is systematically smaller than the time rate of change of expenditures or services for the elderly, dE/dt , then it becomes increasingly difficult to balance the general fund each year, and pressures grow for off-budget transactions to try to honor [1], the balanced budget requirement of the Pennsylvania Constitution.⁶ Off-budget transactions can occur through the transfer term in [2] from off-budget agencies and commissions.

North Carolina, North Dakota, and Tennessee) impose higher effective income tax rates on the elderly than on the non-elderly. See also Rick Olin, "Individual Income Tax Provisions in the States," Wisconsin Legislative Fiscal Bureau (July 2012), for a comprehensive state-by-state review of state taxation of the major components of personal incomes. While there is substantial literature designed to ascertain whether or not taxes play an important role in explaining migration decisions/patterns of the elderly, the most recent literature from Karen Smith Conway and Jonathan C. Rork, "No Country for Old Men (or Women) — Do State Tax Policies Drive Away The Elderly?" 65 *Nat'l Tax J.* 313-356 (June 2012), concludes that taxes are not material in the migration decision of seniors.

⁵See, e.g., Pennsylvania Joint State Government Commission, "Report of the Advisory Committee on Long Term Care Services and Supports for Older Pennsylvanians" (Aug. 2014).

⁶See, e.g., Beverly S. Bunch, "The Effect of Constitutional Debt Limits on State Governments' Use of Public Authorities," 68 *Pub. Choice*, 57-69 (1991), and James M. Poterba, "Balanced Budget Rules and Fiscal Policy: Evidence from the States," 48 *Nat. Tax J.* 3, at 329-336, for discussions about how various debt limits work among the states.

Also, operating expenses can be amortized both on budget and off budget (via off-budget agencies and commissions) through the direct and indirect sale of state public debt, which can temporarily allow [1] to be honored. That is, the Net Worth _{t} term, mainly through indebtedness transactions in [2], can be manipulated to satisfy [1], although the use of multiyear financing for annual operating expenses is at best ill-advised. Finally, by mixing accounting principles, for example, optimistically accruing revenue while reporting expenditures on a cash basis, [1] can be temporarily honored. Generally, elected officials shy away from raising the rate of tax to balance the budget for fear of electoral retribution, especially during election years. Also, at some point these off-budget transactions can attract the attention of bond rating agencies as well as capital markets more generally, and borrowing becomes more expensive for state government.⁷ Pennsylvania experienced bond rating downgrades in 2013 and 2014, as the legislature and governor found it increasingly difficult to achieve prospective budgetary balance.

I.B. Summary of Findings

We find that over the period 1971-2013, the tax base elasticity of Pennsylvania's flat rate personal income tax regarding broadly measured personal income is 0.95 to 0.99. Unless spending pressures also grow at a rate less than or equal to the rate of growth of broadly measured U.S. Department of Commerce's Bureau of Economic Analysis (BEA) personal income, there will continue to be structural deficit pressures attributable to the elderly on the commonwealth's budget. However, given demographic projections of an increasingly older population and the fact that seniors have an above-average need for public services, especially long-term care, elected officials will continue to grapple with this fiscal mismatch. We find, for example, Pennsylvania's income elasticity of expenditures for senior services out of the general fund and off budget to be about 1.4 to 1.5.

Pennsylvania, along with Mississippi and New Hampshire, entirely excludes private retirement income from its individual income tax base. The commonwealth, along with six other states, also entirely excludes public retirement income. Of the 43 states and the District of Columbia, which have some form of personal income taxation, 16 states entirely tax private retirement income and 11 entirely tax state and local retirement income, while 19 partially tax private retirement income and 20 partially tax state and local retirement income. Exclusion of employer pension

⁷Historically, public sector bond insurance was available until the recent Great Recession, and while quite expensive, it could overcome capital market resistance to lending to state governments that had been fiscally imprudent. Private underwriting and placement to friendly, but expensive, lenders has continued to be popular; however, current federal bankruptcy proceedings in Detroit that project to return 40 cents or less on each borrowed dollar to friendly lenders may portend a new chapter in state and local borrowing.

contributions and of actual employee receipt of pension income is, in effect, a lifetime tax expenditure.

The tax expenditure attributable to excluding public and private retirement income from Pennsylvania's personal income tax base was \$2.5 billion in forgone tax revenue, or 21.5 percent of personal income tax collections in 2014. This amounts to 8.8 percent of the general fund. While both service outlays and tax expenditures for the elderly are predicted to grow by 2025, the vast increase in the number of relatively young seniors and their related tax expenditures will equal service outlays in 2025. That is, if tax expenditures for the elderly could be eliminated, they would more nearly pay for the increased service costs to the elderly in 2025. See Table 1 below.

Year	Service Outlays for Elderly From General Fund and Off Budget (\$billions)	Tax Expenditures for Elderly Retirement Income (Private and Public) (\$billions)
2013 (actual)	4.2 to 4.7	2.5
2025	5.8 to 7.8	5.4 to 7.1

I.C. Organization of Report

The report is organized as follows: Section II discusses the constitutional and statutory history of the personal income tax in Pennsylvania, and places among the states and the District of Columbia Pennsylvania's policy to exempt all retirement income from its personal income tax base. It also explains Pennsylvania's constitutional balanced budget requirement. Section III defines and characterizes the revenue elasticity of Pennsylvania's personal income tax base regarding the overall economy, and defines and characterizes the expenditure elasticity of major state services to the elderly concerning broad measures of the economy. Section IV reports empirical demographic patterns, patterns of the tax base as well as of personal income, tax expenditures in the personal income tax base, spending on seniors out of the Pennsylvania general fund, various bivariate models and associated elasticities of the tax base, and spending on seniors. Section V presents predictions of tax expenditures through 2025 using several different methods, as well as predictions of spending on seniors through 2025, and compares predicted spending on seniors out of the general fund to predicted forgone tax revenue from excluding retirement income entirely from Pennsylvania's personal income tax base. Section VI summarizes the report's findings.

II. The Constitutional and Statutory Setting of Pennsylvania's Flat Rate Personal Income Tax

A. The Constitutional Basis and Nature of Pennsylvania's Personal Income Tax

The Pennsylvania personal income tax was first enacted in March 1971 as Article III of the Tax Reform Act of 1971

(P.L. 6) but was found unconstitutional by the Pennsylvania Supreme Court in *Tightman, Amidon, Concerned Taxpayers of Allegheny County v. Commonwealth*.⁸ An acceptable individual income tax statute was enacted later in 1971. The invalidated income tax used the federal taxable income base, which the court held violated the Pennsylvania Constitution's uniformity clause in Article VIII, section 1. The clause dates back to the Pennsylvania Constitution of 1874. The current clause states that "all taxes shall be uniform, upon the same class of subjects, within the territorial limits of the authority levying the tax, and shall be levied and collected under general laws."

In *Tightman*, the Pennsylvania Supreme Court noted that reliance on federal taxable income, then line 50 of federal Form 1040, was nonuniform because of various federal exclusions and deductions that resulted in two taxpayers with different sources of income being treated differently even though the Pennsylvania tax rate was fixed at 3.5 percent. The court noted how the IRC treated differently one taxpayer whose income was from state and local bond interest, exempting it from federal taxation, and another whose income, numerically identical to the first, was from wages and salaries, which was not exempted. The court found that disparity to be facially nonuniform and in violation of the constitution's uniformity requirement.

Moreover, in *Tightman*, the Pennsylvania Supreme Court noted that in 1935 it held in *Kelley v. Kalodner*⁹ that the proposed 1935 Pennsylvania individual income tax, which provided a standard deduction for living expenses of \$1,000 for single persons and \$1,500 for married couples, was nonuniform, because the tax would vary as a result of the difference in allowed deductions, even though the gross income or starting point in the calculation could be identical. The court further held in *Kelley* that the structure of progressive tax rates — the rate of tax increasing as taxable income increased — was also nonuniform because a dollar of additional income of a lower-income taxpayer would be taxed at a different rate than a dollar of additional income of a higher-income taxpayer.

Pennsylvania's uniformity requirement is notable in several other respects. First, it applies to all types of taxation and all types of taxpayers. Second, under the uniformity clause, taxes must be levied by the authority whose taxpayers are subject to the tax. Thus, the General Assembly is prohibited from enacting through a statewide statute a multicounty regional sales tax for the financing of sports stadiums for the benefit of one region. And the General Assembly may not enable an unelected (for example, appointed) regional authority to levy a regional sales tax because an appointed body is incapable of enacting general laws.

⁸279 A.2d 38 (Pa. 1971).

⁹181 A. 598 (Pa. 1935).

While Article VIII, section 1 of the Pennsylvania Constitution introduces strict uniformity requirements for state or local tax, Article VIII, section 2 of the Pennsylvania Constitution permits the General Assembly to enact differential and beneficial tax treatment for the aged, disabled, infirm, or poor, with specific treatment of these groups regarding the ownership and sale of real property.¹⁰

In the 1971 statute in which the General Assembly successfully responded to *Tightman*, private and public retirement income was excluded from the calculation of gross income for taxation. This was accomplished in the negative definition of compensation in Title 72, section 7301 of the Tax Reform Act of 1971:

The term "compensation" shall not mean or include: (i) periodic payments for sickness and disability other than regular wages received during a period of sickness or disability; or (ii) disability, retirement or other payments arising under workmen's compensation acts, occupational disease acts and similar legislation by any government; or (iii) payments commonly recognized as old age or retirement benefits paid to persons retired from service after reaching a specific age or after a stated period of employment; or (iv) payments commonly known as public assistance, or unemployment compensation payments by any governmental agency; or (v) payments to reimburse actual expenses; or (vi) payments made by employers or labor unions, including payments made pursuant to a cafeteria plan qualifying under section 125 of the Internal Revenue Code of 1986 (Public Law 99-514, 26 U.S.C. section 125), for employee benefit programs covering hospitalization, sickness, disability or death, supplemental unemployment benefits or strike benefits.

As will be discussed below, the exemption of private and public retirement income through section 2(b)(ii) of the Pennsylvania Constitution is increasingly to blame for the state's current and foreseeable fiscal difficulties.

¹⁰(b) The General Assembly may, by law:

(ii) establish as a class or classes of subjects of taxation the property or privileges of persons who, because of age, disability, infirmity or poverty are determined to be in need of tax exemption or of special tax provisions, and for any such class or classes and standards and qualifications, and except as herein provided may impose taxes, grant exemptions, or make special tax provisions in accordance therewith. No exemption or special provision shall be made under this clause with respect to taxes upon the sale or use of personal property, and no exemption from any tax upon real property shall be granted by the General Assembly under this clause unless the General Assembly shall provide for the reimbursement of local taxing authorities by or through the Commonwealth for revenue losses occasioned by such exemption.

B. Pennsylvania's Balanced Budget Requirement

Pennsylvania, like most states, constitutionally and statutorily requires the governor and legislature to enact a balanced budget. Pennsylvania's constitutional provisions deal with debt issuance for specific capital projects, a prohibition of state debt pledged to or assumed on behalf of municipalities, and minimum requirements for the submission of the state's operating budget, capital budget, and five-year budgetary plan.¹¹ The constitutional language, found in Article VIII, section 7, is as follows:

(a) Debt may be incurred without the approval of the electors for capital projects specifically itemized in a capital budget if such debt will not cause the amount of all net debt outstanding to exceed one and three-quarters times the average of the annual tax revenue deposited in the previous five fiscal years as certified by the auditor general. For the purposes of this subsection, debt outstanding shall not include debt incurred under clauses (1) and (2)(i), or debt incurred under clause (2)(iii) if the original debt would not be so considered, or debt incurred under subsection (3) unless the General Assembly shall so provide in the law authorizing such debt.

(b) All debt incurred for capital projects shall mature within a period not to exceed the estimated useful life of the projects as stated in the authorizing law, and when so stated shall be conclusive. All debt, except indebtedness permitted by clause (2)(i), shall be amortized in substantial and regular amounts, the first of which shall be due prior to the expiration of a period equal to one-tenth the term of the debt.

The constitution also states that the credit of the state shall not be pledged¹² and that the commonwealth may not assume municipal debt.¹³

The constitution, in Article VIII, section 12, establishes the minimum requirements for an operating budget, capital budget, and five-year plan, which the governor submits to the General Assembly:

Annually, at the times set by law, the governor shall submit to the General Assembly:

(a) A balanced operating budget for the ensuing fiscal year setting forth in detail (i) proposed expenditures

¹¹Pennsylvania's Administrative Code of 1929 implements this constitutional requirement.

¹²Article VIII, section 8: "The credit of the Commonwealth shall not be pledged or loaned to any individual, company, corporation or association, nor shall the Commonwealth become a joint owner or stockholder in any company, corporation or association."

¹³Article VIII, section 9: "The commonwealth shall not assume the debt, or any part thereof, of any county, city, borough, incorporated town, township or any similar general purpose unit of government unless such debt shall have been incurred to enable the commonwealth to suppress insurrection or to assist the Commonwealth in the discharge of any portion of its present indebtedness."

classified by department or agency and by program and (ii) estimated revenue from all sources. If estimated revenue and available surplus are less than proposed expenditures, the governor shall recommend specific additional sources of revenue sufficient to pay the deficiency and the estimated revenue to be derived from each source;

(b) A capital budget for the ensuing fiscal year setting forth in detail proposed expenditures to be financed from the proceeds of obligations of the Commonwealth or of its agencies or authorities or from operating funds; and

(c) A financial plan for not less than the next succeeding five fiscal years, which plan shall include for each such fiscal year:

(i) Projected operating expenditures classified by department or agency and by program, in reasonable detail, and estimated revenues, by major categories, from existing and additional sources, and

(ii) Projected expenditures for capital projects specifically itemized by purpose, and the proposed sources of financing each.

Under Article VIII, section 13: "Operating budget appropriations made by the General Assembly shall not exceed the actual and estimated revenue and surplus available in the same fiscal year."

While the above appears to require fiscal rectitude, it has been increasingly common for the general fund, which has been interpreted to be the operating portion of the state's fiscal activities, to exclude expenditures from various commissions, boards, and trust funds.¹⁴ For example, in 2012 the general fund was only 31 percent of the consolidated financial activities of Pennsylvania as measured by the Governments Division of the U.S. Bureau of the Census.¹⁵

C. Taxation of Retirement Income Elsewhere

State taxation of individual income predates the 1909 amendment to the U.S. Constitution enabling the taxation of corporations and the 1913 amendment to the U.S. Constitution enabling the federal taxation of individuals without regard to apportioning the tax among the states. Several New England colonies imposed both property taxes and taxes on "faculties," and the latter would now be characterized as an income tax. During the Civil War, the North repeatedly imposed an income tax to finance the war; however, the U.S. Supreme Court annually found it unconstitutional, only to face yet another new variant, which was

then litigated. Pennsylvania imposed a tax on dividends as early as 1835 and imposed a faculty tax in the 18th century.¹⁶

Today 43 states and the District of Columbia¹⁷ impose some form of income tax on persons and households. As stated above, Olin found, upon reviewing the individual income tax forms of these states, that 16 states entirely tax private retirement income and 11 entirely tax state and local retirement income, while an additional 19 states partially tax private retirement income and 20 partially tax state and local retirement income.¹⁸ Thus, 35 states tax, in whole or in part, private retirement income, while 31 states tax, in whole or in part, state and local retirement income. Pennsylvania, along with Mississippi and New Hampshire, which do not tax personal income, entirely exclude their private retirement income from their tax base, as well as public retirement income, along with six other states. See Table 2.

III. Defining and Measuring State Revenue and Expenditure Elasticities

A. General Modeling Strategy

We are interested in the long-run relationship between the personal income tax base in Pennsylvania and the overall growth in the scale of the ability to pay of the household sector. In particular, we want to know how the growth in the household sector affects both the revenue base of the state as well as the demand or expenditures for public services for seniors.¹⁹ On the revenue side, we are interested in how the tax base grows with the overall growth in the household sector. Personal income before any taxes in Pennsylvania, and without regard to transfers such as Medicare and Medicaid, as measured by the BEA, is precisely such a measure.

When we turn to the expenditure side for seniors, we are asking how budget outlays directed to the benefit of seniors relate or respond to the community's ability to pay. This second kind of relationship may be thought of as a summary of a public choice process, because taxpayers are by definition stakeholders and spending decisions that benefit seniors must be made through the General Assembly's appropriations process. By statistically estimating the relationship between, say, Medicaid spending — which principally benefits the elderly because one-third of every Medicaid dollar appropriated from the general fund is for long-term, or nursing home, care — and various measures of personal

¹⁴Also, the governor has line-item veto authority to force enacted spending legislation that he approved to meet balanced budget requirements. See Pennsylvania's Administrative Code of 1929, as amended, Article VI, section 613.

¹⁵The measurement and interpretation of state balanced budget requirements are by no means well established.

¹⁶See E.A. Seligman, *The Income Tax: A Study of the History, Theory, and Practice of Income Taxation at Home and Abroad* (1914).

¹⁷We include the District as a state in our description of patterns of subnational income taxes.

¹⁸*Supra* note 4.

¹⁹We use the term "seniors" to denote those over age 60. Pennsylvania law designates them as age 60 and above or age 65 and above.

Table 2.
State Tax Exclusion for Pension/Retirement Income (Tax Year 2011) From Olin (2012)

State	Private	State and Local	Federal Civilian	Military
Alabama	State Calculation	Most Exempt	Exempt	Exempt
Arizona	None	\$2,500	\$2,500	\$2,500
Arkansas	\$6,000	\$6,000	\$6,000	\$6,000
California	None	None	None	None
Colorado	\$20,000/\$24,000	\$20,000/\$24,000	\$20,000/\$24,000	\$20,000/\$24,000
Connecticut	None	None	None	50%
Delaware	\$2,000/\$12,500	\$2,000/\$12,500	\$2,000/\$12,500	\$2,000/\$12,500
District of Columbia	None	\$3,000	\$3,000	\$3,000
Georgia	\$35,000	\$35,000	\$35,000	\$35,000
Hawaii	State Calculation	Exempt	Exempt	Exempt
Idaho	None	\$27,876/\$41,814 ^a	\$27,876/\$41,814	\$27,876/\$41,814
Illinois	State Calculation	Exempt	Exempt	Exempt
Indiana	None/\$5,200	None/\$5,200	\$2,000/\$7,200	\$5,000
Iowa	\$6,000	\$6,000	\$6,000	\$6,000
Kansas	None	Some Exempt	Exempt	Exempt
Kentucky	\$41,110	State Calculation	State Calculation	State Calculation
Louisiana	\$6,000	\$6,000/Exempt	Exempt	Exempt
Maine	\$6,000	\$6,000	\$6,000	\$6,000
Maryland	\$26,300	\$26,300 ^b	\$26,300	\$26,300
Massachusetts	None	Exempt ^c	Exempt ^c	Exempt
Michigan	\$45,842	Exempt	Exempt	Exempt
Minnesota	None	None	None	None
Mississippi	Exempt	Exempt	Exempt	Exempt
Missouri	\$6,000	\$6,000	\$6,000	\$6,000
Montana	\$3,760	\$3,760	\$3,760	\$3,760
Nebraska	None	None	None	None
New Hampshire	Exempt	Exempt	Exempt	Exempt
New Jersey	\$15,000	\$15,000	\$15,000	Exempt
New Mexico	None	None	None	None
New York	\$20,000	Exempt	Exempt	Exempt
North Carolina	\$2,000	\$4,000/Exempt	\$4,000/Exempt	\$4,000/Exempt
North Dakota	None	None	None	None
Ohio	\$200 Credit	\$200 Credit	\$200 Credit	Exempt
Oklahoma	\$10,000	\$10,000	\$10,000	\$10,000
Oregon	9% Credit	9% Credit	9% Credit/pre-1991 Exempt	9% Credit pre-1991 Exempt
Pennsylvania	Exempt	Exempt	Exempt	Exempt
Rhode Island	None	None	None	None
South Carolina	\$3,000/\$10,000	\$3,000/\$10,000	\$3,000/\$10,000	\$3,000/\$10,000
Tennessee	Exempt	Exempt	Exempt	Exempt
Utah	None	None	None	None
Vermont	None	None	None	None
Virginia	None	None	None	Most Taxable
West Virginia	None	\$2,000	\$2,000	\$22,000
Wisconsin	State Calculation	State Calculation ^d	State Calculation ^d	Exempt

^aApplies only in the case of some public safety officials.

^bAll pension benefits to police and fire fighters (or their beneficiaries) as a result of job-related injuries (or death) are exempt.

^cOnly contributory pension income is exempt.

^dPayments from specific systems are exempt if employed before 1964.

income, we are examining in effect the income elasticity of demand for seniors' benefits.²⁰

We will explore these relationships by estimating a series of bivariate natural log functions over time. For example, to capture whether Pennsylvania's personal income tax base grows with general community income, we estimate equation [4] below, and after correcting for autocorrelation in its error term:

$$\text{Log}_e (\text{Personal Income Tax Base})_t = \beta_1 + \beta_2 \text{Log}_e (\text{BEA Personal Income})_t + \varepsilon_t \quad [4]$$

B. Empirical Implementation Issues

If we divide personal income tax collections each year by the statutory rate of the Pennsylvania individual income tax, we obtain an annual estimate of the individual income tax base that is largely independent of statutory changes in the tax rate itself. Since the individual income tax's inception in 1971, the rate has been changed 10 times, so focusing on the base rather than on collections enables the use of a bivariate regression model that seeks to examine how economic trends affect the revenue side of the budget. Given that Pennsylvania's personal income tax is strictly proportional in rate and does not accord personal exemptions or deductions, we would expect that as broadly measured community income rises, the tax base should rise proportionately or that β_2 should equal 1. Personal income, as measured by the BEA, is defined as detailed in Table 3.

Of particular interest is how this economywide measure of the state's ability to pay relates to the measured tax base, and how this economywide measure affects Pennsylvania's spending on the elderly over time. Because the elderly receive cash and in-kind benefits or transfers in the form of Social Security cash benefits, Medicare health benefits, and Medical Assistance or Medicaid health benefits for the indigent elderly, primarily in the form of nursing home services, all of which are in BEA Line 23 above, we use both a broad and narrow concept of personal income when seeking to measure the elasticity of income on the personal income tax base, and on general fund spending on the elderly. The broad concept of personal income in Table 3 is BEA line 26, which we denote Y_b ; the narrow concept of personal income, Y_n , is BEA line 26 reduced by BEA line 23 in Table 3.

The paucity of research literature that empirically measures the composition and total of state benefits to seniors suggests that this is not an easy undertaking. There are several reasons why measurement is difficult. First, many state-appropriated resources devoted to the elderly reflect federal healthcare policy, which has materially changed over the past

²⁰See, e.g., Robert P. Strauss and J. David Hughes, "A New Approach to the Demand for Public Goods," 6 *J. of Pub. Econ.* 1 (Fall 1976), at 191-204, or Edward V. Gramlich and Daniel N. Rubinfeld, "Micro-Estimates of Public Spending Demand Functions and Tests of the Tiebout and Median-Voter Hypotheses," 90 *J. of Pol. Econ.* 3 (1982), for empirical estimates of the income elasticity of demand for public services.

Table 3.
Components of BEA Personal Income

Table 3 of BEA System of Accounts	
BEA Line	Personal income
10	Compensation of employees, received
11	Wages and salary disbursements
12	Domestic
13	Rest of the world
14	Supplements to wages and salaries
15	Employer contributions for employee pension and insurance funds
16	Employer contributions for government social insurance
17	Proprietor's income with inventory adjustment and consumption adjustments
18	Rental income with inventory valuation and depreciation adjustments
19	Personal income receipts on assets
20	Personal interest
21	Dividend income received
22	Personal current transfer receipts
23	Government social benefits
24	From business (net)
25	Less contributions for government social insurance
26	Total Personal Income
<i>Source:</i> BEA, "Measuring the Economy: A Primer on GDP and the National Income and Product Accounts" (2007), at 9.	

25 years. Second, state appropriations reflect not only what Pennsylvania is willing to spend through its budgetary process each year, but also before and after federal reimbursement for federally induced spending. Third, especially for long-term or nursing home care for the elderly, there have been material changes in federal and state policy about where the elderly might best spend their final years. Historically, Medical Assistance- or Medicaid-financed long-term or nursing home care for the indigent elderly, and federal eligibility rules required that the elderly be without personal assets or income in order to qualify for nursing home care. Medicare provided for only 100 days of nursing home care per year, so those seniors in need of further long-term care had to spend down their assets to qualify for Medicaid-financed long-term care. Most recently, the federal government and many states, including Pennsylvania, have redirected policies and resources to encourage the elderly to remain at home or in the care of family, and have financed home-delivered services.

Fourth, much of the record keeping necessary to identify state spending for the benefit of the elderly is incomplete. For example, Pennsylvania's published statistics on the composition of Medical Assistance beneficiaries differentiate

Table 4.
Predicted Medicaid Beneficiaries by Type and Total (Federal and State Source) Spending 2014-2015

Beneficiary Category	Predicted Number of Beneficiaries	Percent of Predicted Beneficiaries	Predicted Spending (\$thousands)	Percent of Predicted Spending
Elderly	377,034	16.7%	\$7,115,436	32.5%
Disabled	542,558	24%	\$9,792,297	44.7%
Families	1,263,515	55.9%	\$4,482,234	20.5%
Single Adults	75,429	3.3%	\$517,192	2.4%
Total	2,258,536	100%	\$21,907,159	100%

Source: Pa. Department of Budget (Feb. 2014), at E37.15.

between the elderly and non-elderly in those receiving long-term care, but do not differentiate between the elderly and non-elderly in those receiving benefits for mental or physical disabilities.²¹

Table 4, from the governor's February 2014 budget submission, displays the predicted distribution of Medicaid beneficiaries by type, and also the predicted Medicaid spending by type. We see that 377,034 seniors are expected to receive \$7.1 billion in long-term care expenditures, or 32 percent of total Medical Assistance spending during fiscal 2015.

Another way to measure the benefits that seniors receive through state appropriations is to build up the actual own source program spending amounts from the three major agencies charged with providing services to the elderly: the Pennsylvania Department of Aging, the Pennsylvania Department of Public Welfare, and the tobacco settlement fund. We briefly discuss these agencies and their programs for the elderly below.

C. Pennsylvania Department of Aging

The Pennsylvania Department of Aging was created in 1978 to enhance the quality of life of seniors as well as to protect them from abuse and neglect. It implements state responsibilities under the federal Older Americans Act, and administers caregiver support; transportation; personal care services; medical supplies and equipment; adaptive devices; emergency response systems; home- and community-based care; domiciliary care homes; senior housing; aging in place care; and nutritional services, including meals on wheels.²² When the Pennsylvania Department of Aging was established, the Pennsylvania Lottery was established as a dedicated financing source for the department. The lottery fund finances the Property Tax/Rent Rebate Program; pharmaceutical assistance contracts of the elderly (PACE) and PACE Plus, a prescription drug program for low-income qualified seniors; and free transportation for the elderly,

²¹Increasingly, appropriations for the benefit of the elderly have come out of off-budget funds, for example, the Pennsylvania Lottery, and have been directed to expenditure accounts that are outside the state's balanced budget requirement.

²²See Joint State Government Commission, *supra* note 5, at 59-70.

Alzheimer's outreach, and other programs. Beginning in 2006, the lottery fund was also used to support the cost of long-term care. In 2014, home- and community-based care was supported by appropriations out of the lottery fund.

D. Tobacco Settlement Fund

In May 1998, 46 state attorneys general settled with the five largest U.S. tobacco manufacturers. The states had sued, alleging their Medicaid healthcare costs were unduly large because of the hazards of tobacco smoking. In December 1999 a tobacco settlement fund was established to receive money from the Master Settlement Agreement. In the agreement, the manufacturers agreed to pay a minimum of \$206 billion over 25 years to the states.

Beginning in 2001, the General Assembly appropriated money from the tobacco settlement fund for the benefit of seniors. Initially, money from the tobacco settlement fund was used to provide funding for healthcare insurance for the uninsured, home- and community-based services for seniors, and other purposes. Since 2005-2006 a portion of the settlement payments has been used to pay for the costs of long-term care services of the elderly and disabled persons. In 2013-2014, specific allocations were used to fund home- and community-based services (13 percent), tobacco use prevention and cessation services (4.5 percent), health research (13.8 percent), uncompensated care (8.18 percent), Medicaid benefits for disabled workers (30 percent), expansion of the prescription drug program (8 percent), and other health-related purposes (22.7 percent).²³

E. Pennsylvania Department of Public Welfare

The Pennsylvania Department of Public Welfare is responsible for providing cash and in-kind benefits to poor families and individuals, and it was substantially reorganized in 1967. The department administers the federal/state program of Medical Assistance or Medicaid, and is responsible for enforcing functional income eligibility requirements. Medical Assistance services include inpatient hospital care, outpatient psychiatric care, drug and alcohol clinic

²³See 2014-2015 Budget Proposal of Gov. Tom Corbett (R), at p. H81.

Table 5.

Components of Pennsylvania Own-Source, Financed Outlays for the Benefit of Senior Citizens by State Agency and Program

1. Department of Public Welfare (State money only)	2. Department of Aging (State money only)
1.1 GENERAL FUND	2.1 GENERAL FUND
Supplemental Grants — Aged, Blind, and Disabled	General Government Operations
Medical Assistance — Outpatient ^a	Medical Assistance Support
Medical Assistance — Inpatient ^a	Family Caregiver
Medical Assistance — Capitation ^a	Pre-Admission Assessment
Medical Assistance — Obstetrics and Neonatal ^a	Grants to Senior Centers
Long-Term Care	Legal Advocacy for Older Pennsylvanians
Home and Community-Based Services	Alzheimer's Outreach
Long-Term Managed Care	Medical Assistance — Academic Medical Centers ^a
Medical Assistance — Physician Practice Plans ^a	
Medical Assistance — Transportation ^a	2.2 LOTTERY FUND
Attendant Care	GGO
Medical Assistance — Workers with Disabilities ^a	PACE
Acute Care Hospitals	Pre-Admission Assessment
	Family Caregiver
	Alzheimer's Outreach
1.2 LOTTERY FUND	PennCare/Aging Programs
DPW: Long Term Care	Grants to Senior Centers
DPW: Transfer to the General Fund — LTC	Transportation Grants
DPW: Pre-Admission Assessment	Home and Community Based Services
DPW: Medicare Part B Payments	
DPW: Supplemental Grants to the Aged	2.3 TOBACCO SETTLEMENT FUND
DPW: Community Mental Retardation Services — Elderly	Home and Community Based Services (to DPW 12-13)
DPW: Home & Community Based Services	PACENET Transfer
DPW: MA Transportation	
1.3 TOBACCO SETTLEMENT FUND	3. OTHERS (STATE MONEY ONLY)
DPW: MA Workers with Disabilities	PennDOT — Older Pennsylvanians Free Transit (EA) ^a
DPW: Hospital Uncompensated Care	PennDOT — Fixed Route Transportation ^a
DPW: Uncompensated Care	PennDOT — Transfer to Public Transportation Trust Fund
DPW: MA Long Term Care	PennDOT — Older Pennsylvanians Shared Rides (EA)
DPW: Home and Community Based Services (incl. aging starting 12-13)	Revenue — Property Tax & Rent Rebate (EA)

^aFrom 2007 to 2015, around 26% to 35% of total Medicaid were included as expenditure for elderly, as indicated by Executive's budget. From 2003 to 2006, we estimate that 31.1% of total Medicaid expenditure were spent for elderly each year.

services, prescription drug and home healthcare. The department serves nearly 3 million individuals, and the Medical Assistance program costs about \$15 billion per year; 55 percent of this is financed by the federal government. Long-term care costs \$5.3 billion, of which the federal government pays 55 percent.²⁴

After discussions with experts on services accorded to the elderly, we devised a measurement strategy (see Table 5), which involved adding various agency programs together each year. We define narrowly defined seniors programs, S_n ,

to be items 1-2 in Table 5, and define broadly defined seniors programs, S_b , to be $(S_n + \text{Others})$ in Table 5.

IV. Empirical Patterns of Pennsylvania's Demography, Income, and Elasticity Results

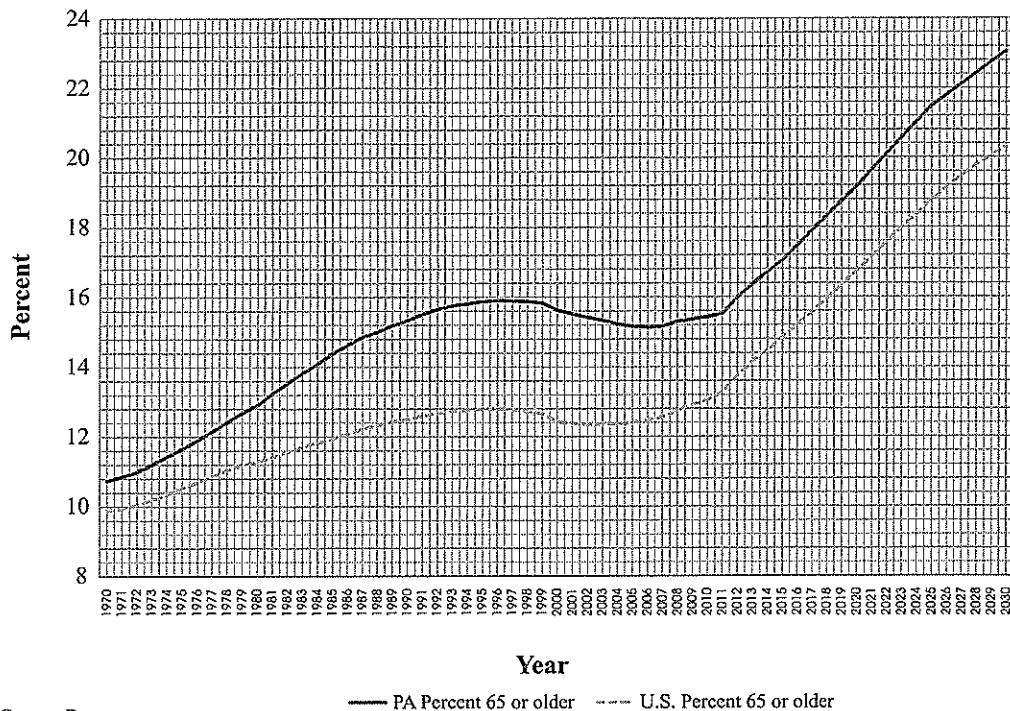
A. Pennsylvania's Demography

Pennsylvania's elderly population, those over age 65, has been a greater share of the state's population than the elderly are for the entire United States for a long time. Figure 1 shows that the elderly proportion of Pennsylvania's population began rising, from 15.2 percent in 2007 to 16.4 percent in 2014; by 2030 it is predicted to reach 23.1 percent.

In 2013, 21.8 percent of Pennsylvania's population were 18 and under, and 16.4 percent were 65 and older. Thus, the dependent population was 37.7 percent of the total 2013

²⁴See Joint State Government Commission, *supra* note 5, at pp. 83-99.

Figure 1.
Percent of U.S. and Pennsylvania Population Over Age 65: 1970-2030



Source: U.S. Census Bureau

population.²⁵ Equally striking is that the absolute number of seniors in Pennsylvania will dramatically increase, while the total population remains rather stagnant at about 12.5 million to 12.7 million people. (See Figure 2.)

A recent demographic study at Penn State’s Population Institute predicted:

The number of elementary school age children 5-14 is projected to decline by almost 8 percent in 2020 with a total decline of 9 percent by 2030. The high school age population 15-19 years is projected to decline by 33 percent between 2010 and 2030. This population decline is largely due to a decline in births by the largest race group, Whites, and in comparison to the larger birth cohorts born in the early 1990s as children of the Baby Boomers.

The labor force age population aged 30-64 is expected to decline from 5.66 million in 2010 to 5.38 million in the year 2030, or by about 7.4 percent. The population aged 65+ is projected to increase by 64 percent during the next 20 years. Increased survivorship at the

oldest ages for all race groups coupled with the Baby Boomers reaching this age milestone is driving this population trend.²⁶

The changing age distribution of Pennsylvania’s children between now and 2030 has substantial implications for school operating fund needs, including the number of teachers and the capital or space requirements to educate the children.

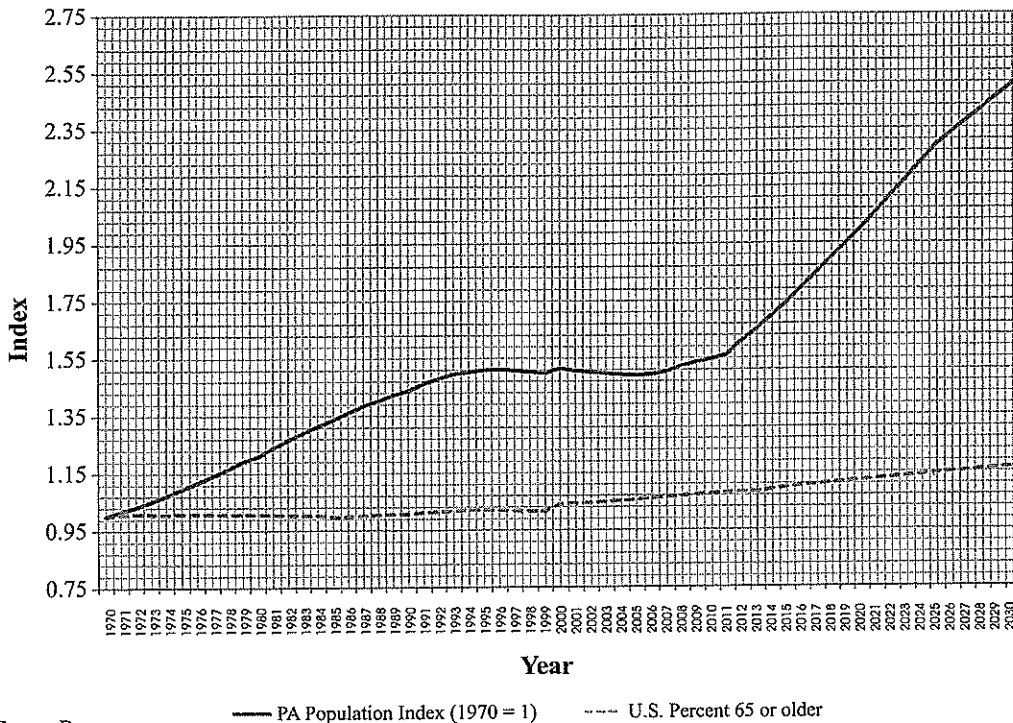
Regarding net migration of Pennsylvania residents by age, Catherine Tucker reports, on the basis of analysis of the Census Bureau’s American Community Survey over the period 2006-2010, that whites and blacks show very modest out-migration rates, while other ethnic groups show substantial net in-migration for all age groups. Note that a negative entry in Table 6 indicates a net out-migration per age group and that a positive entry indicates a net in-migration per age group.²⁷

²⁶Catherine Tucker, “Pennsylvania Population Projections: Background Reports,” Population Research Institute, Penn State University (2012), at 7.

²⁷Given Pennsylvania’s preferential tax treatment of retirement income, and its generous support of senior services, the low migration rates are surprising. The low levels of migration reported in Table 6 are consistent with Conway and Rork, *supra* note 4). At the conference where this paper was presented in September 2014, several members of (Footnote continued on next page.)

²⁵U.S. Census Bureau, “State and County QuickFacts.”

Figure 2.
Absolute Size of U.S. and Pennsylvania Elderly Population: 1970 = 1



Source: US Census Bureau

B. Patterns of Pennsylvania Taxable and Personal Income

Pennsylvania’s individual income tax is broader than those of most other states in several ways. First, gains on the sale of capital assets are taxed as ordinary income, but at the federal level, and in many other states, those capital gains are taxed at lower, preferential tax rates. Second, Pennsylvania does not accord to its individual income tax payers any personal exemptions, and that policy has been upheld through state supreme court decisions, as earlier discussed. Third, economic losses from business activities or from the sale of capital assets may not be used to offset other positive income such as compensation or wages.

Two aspects of Pennsylvania’s personal income tax base are of interest: the pattern of growth in the tax base per return and the relationship of the Pennsylvania personal income tax in comparison to the BEA series on personal

the audience, familiar with caseloads on the elderly in the Lehigh Valley, commented that increasing numbers of New Jersey and New York retirees were moving to Pennsylvania because of its generous tax policy towards retirement income and the high level of services accorded the elderly. Should these changes persist and the emerging healthcare costs of those over 85 grow beyond what has been observed historically, the estimates for 2025 may prove to be unduly optimistic.

Table 6.
Net Migration Rates per 1,000 People for Pennsylvania 2006-2010

Age	White	Black	Other
0-9	0.0056	-0.00357	0.01038
10-19	0.00531	0.00172	0.02857
20-29	-0.00172	0.00146	0.02939
30-39	0.00504	0.00314	0.02380
40-49	0.00077	0.00358	0.01455
50-59	-0.00008	0.00042	0.02131
60-69	-0.00089	-0.00049	0.00656
70-79	-0.00033	-0.00318	0.00258
80+	-0.00084	0.00084	0.02217

Source: Catherine Tucker, “Pennsylvania Population Projections: Background Reports,” Population Research Institute, Pennsylvania State University (2012), at 46.

income. Table 7 indicates that over the period 1990-2011, for which data are available, the taxable income per return doubled.

Table 8 shows the Pennsylvania taxable personal income tax base that was obtained by dividing tax collections in a given year by the statutory tax rate in that year, and compares it with the BEA series on total personal income. As is

evident, taxable personal income has averaged 61 percent of BEA personal income, and varied between 57 percent and 67 percent. Table 8 shows that over the period 1990-2011, total taxable income grew from \$147 billion to \$321 billion. While the per-tax-return tax base doubled, the total tax base more than doubled; the ratio of \$321 billion to \$147 billion is 2.18. Thus, during that period, the number of individual income tax returns increased more than the average taxable income per return. As is well known, Pennsylvania raised its individual income tax rate several times during this period to meet budgetary objectives. However, as noted in the above section dealing with demography predictions, the number of working-age Pennsylvanians as compared with the number of children and seniors will decline.

Table 7.
Taxable Compensation per Tax Return in Pennsylvania
1990-2011

Year	Taxable Income Per Tax Return	Index: 1990 = 1
1990	\$21,054	1.00
1991	\$21,533	1.023
1992	\$23,054	1.095
1993	\$23,290	1.106
1994	\$24,159	1.147
1995	\$25,314	1.202
1996	\$26,269	1.248
1997	\$27,731	1.317
1998	\$29,357	1.394
1999	\$30,446	1.446
2000	\$31,936	1.517
2001	\$32,649	1.551
2002	\$33,218	1.578
2003	\$34,234	1.626
2004	\$35,631	1.692
2005	\$36,677	1.742
2006	\$38,302	1.819
2007	\$39,450	1.874
2008	\$40,504	1.924
2009	\$40,157	1.907
2010	\$40,799	1.938
2011	\$41,942	1.992

Source: Author's calculations using Pennsylvania Department of Revenue data.

Over the same period, 1982-2011, Medicare plus Medicaid has risen systematically from 3.5 percent to 8.4 percent of total BEA personal income (see Table 9).²⁸

²⁸The Medicaid component in Table 9 is for all age groups and thus overstates seniors' share of this program.

In 2001-2002, Pennsylvania adopted SAP software to enable the Governor's Budget Office and the General Assembly to electronically share or track the same information about budget codes, budget requests, actual appropriations, and spending to date. Unfortunately, because of that change, we are able to analyze spending on seniors only since 2002-2003. Table 10 presents the aggregate amounts spent on seniors using the classification scheme developed and presented in Table 5. Over the 12-year period, both narrowly and broadly defined spending on seniors' programs nearly doubled. The average annual growth rate in this spending was about 6.3 percent, the median annual growth rate was about 4.3 percent, and the growth rate was as high as 26.7 percent per year and as low as 14.1 percent per year.

While spending for seniors has been increasing, the tax forgone from excluding private and public retirement income from the personal income tax base or tax expenditures has also been growing. In 1990 it was \$591 million, or 17.9 percent of collections, while in 2013 it was \$2.48 billion, or 21.5 percent of collections. (See Table 11.)

C. Elasticity Regression Results

In this section of the report, we explore a series of bivariate regression models, corrected for autocorrelation, whose overall purpose is to describe how important tax and expenditure variables for the elderly move over time with Pennsylvania's underlying economy. Our goal is to compare the trends or trajectories of various elasticities. First, we examine how the personal income tax base relates to broad and narrow definitions of BEA personal income. Second, we examine how narrowly and broadly defined state spending for seniors relates to BEA personal income with and without Medicare and Medicaid in the measured personal income. Table 12 contains the various bivariate regression results.

Regarding how the personal income tax moves with BEA personal income, we see that for each 1 percent of broad personal income growth, the tax base grows 0.95 percent (see Table 12, panel A), while the tax base grows somewhat faster, 0.99 percent, for each 1 percent growth in narrowly defined BEA personal income. By contrast, the various expenditure elasticities using broad and narrow definitions of spending and BEA personal income are at least 40 percent higher than the tax base elasticities. The expenditure elasticities range from 1.41 to 1.54 (see Table 12, panel B). Such a specification conjectures that spending on seniors is restricted by a political process in which stakeholders, represented by their personal income, subject elected representatives to the constraint of available economic resources.

If we believe that the growth in senior spending is simply driven by the number of seniors, we can estimate elasticity models specifying that S_n or S_b is a function of the elderly. Panel C of Table 12 displays the estimation results and finds that the spending elasticity on seniors regarding the number of seniors is dramatically higher, ranging between 3.73 and 3.76.

Table 8.
Pennsylvania Total Taxable Income and BEA Personal Income 1982-2011

Tax Year	Total Taxable Income (\$billions)	BEA Gross Personal Income Level (\$billions)	Taxable Income/BEA Personal Income
1982	\$87.433	\$140.132	62.4%
1983	\$91.440	\$146.927	62.2%
1984	\$99.615	\$158.658	62.8%
1985	\$104.926	\$168.446	62.3%
1986	\$115.683	\$177.317	65.2%
1987	\$118.503	\$187.890	63.1%
1988	\$135.739	\$203.474	66.7%
1989	\$142.210	\$220.383	64.5%
1990	\$147.112	\$233.147	63.1%
1991	\$148.630	\$242.735	61.2%
1992	\$153.881	\$256.274	60.0%
1993	\$158.839	\$265.948	59.7%
1994	\$165.646	\$275.014	60.2%
1995	\$176.135	\$287.618	61.2%
1996	\$186.216	\$302.456	61.6%
1997	\$202.024	\$317.682	63.6%
1998	\$215.027	\$335.003	64.2%
1999	\$224.591	\$349.686	64.2%
2000	\$237.070	\$374.450	63.3%
2001	\$230.926	\$387.326	59.6%
2002	\$229.685	\$396.486	57.9%
2003	\$237.961	\$409.424	58.1%
2004	\$250.921	\$430.410	58.3%
2005	\$266.800	\$447.274	59.7%
2006	\$288.043	\$476.825	60.4%
2007	\$317.393	\$501.591	63.3%
2008	\$314.872	\$519.543	60.6%
2009	\$294.893	\$514.679	57.3%
2010	\$310.368	\$529.808	58.6%
2011	\$321.131	\$558.345	57.5%

Source: Pennsylvania Department of Revenue; U.S. Census Bureau; U.S. Department of Commerce.

V. The Future of Pennsylvania's Tax Expenditures and Spending on Seniors

In this section, we use the various historical patterns for the elderly in Pennsylvania to ascertain the direct financial implications of a growing senior population in Pennsylvania through 2025.

A. Tax Expenditure Predictions

The first step in predicting the future budget issues regarding the elderly involves projecting the tax expenditures should the current exclusion of retirement income from the personal income tax law remain in place. We first calculate the historical average tax expenditure per elderly person over the period 1990-2013. This is simply the ratio of the total tax expenditure reported annually in the state budget to the Census Bureau's reported count of those over the age of 65. As seen in Table 15, the average tax expendi-

ture attributable to excluding private and public retirement income grew from \$324 per elderly person in 1990 to \$1,171 per elderly person in 2013. Table 15 also displays the growth rate in the tax expenditure per elderly person. As may be observed, the growth rate is quite variable with a mean of 6.3 percent over the period 1991-2013, a recent mean of 4.6 percent over the period 1995-2013, and a median of 4.6 percent over the period 1995-2013.

The second step in predicting future tax expenditures is to use Census Bureau projections of those over 65 through 2025 with a variety of average growth rate assumptions for the amount of tax expenditures per return; these growth rate assumptions range from a conservative growth rate (g) of 4 percent to 4.6 percent, 4.8 percent, and 6.3 percent. Table 13 shows that the tax expenditure for seniors by 2030 falls

Table 9.
Medicare and Medicaid as Percent of
BEA Personal Income in Pennsylvania

Tax Year	Medicare + Medicaid in BEA Personal Income (billions)	Medicare + Medicaid as Percent of BEA Personal Income
1982	\$4.947	3.5%
1983	\$5.561	3.8%
1984	\$5.987	3.8%
1985	\$6.506	3.9%
1986	\$7.179	4.0%
1987	\$7.792	4.1%
1988	\$8.343	4.1%
1989	\$9.037	4.1%
1990	\$10.329	4.4%
1991	\$13.727	5.7%
1992	\$13.880	5.4%
1993	\$15.222	5.7%
1994	\$16.624	6.0%
1995	\$17.501	6.1%
1996	\$19.539	6.5%
1997	\$20.612	6.5%
1998	\$20.322	6.1%
1999	\$21.871	6.3%
2000	\$23.500	6.3%
2001	\$25.207	6.5%
2002	\$26.471	6.7%
2003	\$27.912	6.8%
2004	\$30.112	7.0%
2005	\$33.431	7.5%
2006	\$35.468	7.4%
2007	\$38.122	7.6%
2008	\$40.193	7.7%
2009	\$42.521	8.3%
2010	\$45.036	8.5%
2011	\$46.876	8.4%

Source: U.S. Bureau of Economic Analysis.

between \$7 billion and \$10.5 billion depending on the growth rate assumption for narrowly defined BEA personal income.

B. Predictions of Spending on the Elderly

To predict of expenditures for seniors out of the general fund and off budget, we use several different prediction methods. First, we use the elasticity models from Table 12 and presume that narrowly defined BEA personal income will grow as it has averaged over the past five years, or 2.5 percent per year.

Table 14 displays the results of applying these predictions of personal income multiplied by the two elasticities obtained from Table 12, which are then multiplied by observed seniors' expenditures in 2012 (the last year that we observed

actual tax expenditure data). The predicted seniors' expenditure numbers grow significantly. By 2025, this approach based on personal income elasticities predicts spending on seniors to range between \$5.8 billion and \$7.8 billion in current dollars.

A second approach to this prediction is to simply apply observed expenditure growth rates for S_n ; these growth rates were observed to range between 3 and 5 percent. Table 16 implements this second prediction method, and again by 2025, expenditures out of the general fund for seniors' programs range from \$6 billion to \$7.6 billion in current dollars.

The third approach is to predict spending on seniors on the basis of the number of seniors; that is, we use models 7 and 8 from Table 12 in conjunction with Census Bureau predictions of the elderly population. Table 17 displays the result of this prediction method. It results in 2025 spending on seniors of between \$14.3 billion and \$15 billion. We view this approach as the outer limits on what might be spent, because it presumes, in effect, that no management efforts will be made to try to rein in expenditures out of the general fund for the benefit of seniors.

VI. Summary of Findings

We have sought to characterize the constitutional and statutory setting within which taxation and spending occur in Pennsylvania regarding the elderly, as well as to compare how Pennsylvania taxes retirement income compared with other states of that income and benchmark Pennsylvania's demography; measure the elasticity of the personal income tax base in relation to the state's economy more generally; measure the spending elasticity for seniors out of Pennsylvania's general fund and off budget in relation to the state's economy more generally; and make predictions through 2025 for tax expenditures and spending out of the general fund for the elderly.

Regarding these research questions, we find empirically that Pennsylvania is relatively unique in completely exempting private and public retirement income from the state's individual income tax; over the next 10 years, Pennsylvania can reasonably expect the number of seniors to increase by almost 1 million; the elasticity of the state's personal income tax base regarding broadly measured household income is slightly under 1.0; depending on the measure used, it is between 0.95 and 0.99; spending pressures for the elderly are dramatically higher, and the elasticity of spending on seniors out of the general fund and other sources is between 1.4 and 1.5 regarding variously defined personal income; given the dramatic aging of Pennsylvania's population, spending on seniors out of the general fund will continue to rise quickly, while the tax base will grow slowly and the tax expenditure attributable to excluding seniors' retirement income will grow more quickly; we estimate that by 2025, spending on seniors out of the general fund could range

Table 10.
Pennsylvania General Fund and Off-Budget Outlays for Seniors in Departments of Public Welfare and Aging and Transfers
From the Tobacco Settlement Fund: Fiscal 2002-2003 – Fiscal 2014-2015 (\$thousands)

Year	Narrow Definition (S_n)	Broad Definition (S_b)
2002	\$2,324,643	\$2,570,614
2003	\$2,590,687	\$2,828,944
2004	\$2,518,406	\$2,767,759
2005	\$3,098,799	\$3,363,434
2006	\$3,537,390	\$3,799,382
2007	\$3,574,327	\$3,976,147
2008	\$3,691,585	\$4,127,995
2009	\$3,171,867	\$3,616,650
2010	\$3,155,632	\$3,600,345
2011	\$3,997,081	\$4,450,561
2012	\$4,022,358	\$4,480,701
2013	\$4,232,966	\$4,699,297
2014	\$4,610,888	\$5,071,906

Notes: Excludes federal funds under the American Recovery and Reinvestment Act; 2014 S_n and S_b are budgeted, whereas earlier years are actual expenditures.
Source: Unpublished tabulations of SAP tracking system from Pa. General Assembly. See Table 5 for items included in General Fund outlays for seniors. Attribution of Medicaid expenditures to seniors based on historical experience as reported in Annual Executive Budget.

Table 11.
Taxes Forgone Due to Pennsylvania's Exclusion of Retirement Income From Personal Income Tax 1990-2013

Year	Personal Income Tax Collections (\$millions)	Forgone Tax Revenues Due to Exclusion of Retirement Income (\$millions)	Forgone Tax Revenues as a Percent of Collections
1990	\$3,294.30	\$590.70	17.93%
1991	\$3,363.60	\$646.80	19.23%
1992	\$4,807.40	\$1,023.20	21.28%
1993	\$4,790.00	\$881.10	18.39%
1994	\$4,872.70	\$952.40	19.55%
1995	\$5,083.20	\$1,054.80	20.75%
1996	\$5,374.30	\$1,058.70	19.70%
1997	\$5,745.60	\$1,069.50	18.61%
1998	\$6,236.40	\$1,128.20	18.09%
1999	\$6,683.60	\$1,246.30	18.65%
2000	\$7,066.00	\$1,332.40	18.86%
2001	\$7,491.50	\$1,388.60	18.54%
2002	\$7,138.70	\$1,490.60	20.88%
2003	\$7,105.90	\$1,581.40	22.25%
2004	\$7,733.80	\$1,778.40	23.00%
2005	\$8,746.80	\$1,809.30	20.69%
2006	\$9,524.10	\$1,882.30	19.76%
2007	\$9,634.02	\$1,882.30	19.54%
2008	\$10,907.70	\$1,963.00	18.00%
2009	\$10,198.60	\$2,163.40	21.21%
2010	\$9,968.70	\$2,246.80	22.54%
2011	\$10,435.70	\$2,312.00	22.15%
2012	\$10,800.50	\$2,368.30	21.93%
2013	\$11,371.20	\$2,448.50	21.53%

Source: Pennsylvania Office of the Governor, *Executive Budget, Section D: Tax Expenditures*, selected years.

Table 12.
Elasticity of Personal Income Tax Base With Respect to Y_b and Spending Elasticities

Panel A: Tax Base Elasticity Models						
Dependent Variable	Constant	Explanatory Variable	Period	N	Adj. R ²	Durbin-Watson
1) Log _c (PIT Tax Base)	0.4809	0.9531 Log _c Y _b	1990-2013	26	0.9926	1.91
t-ratio	0.61	23.93				
2) Log _c (PIT Tax Base)	-0.2151	0.9918 Log _c Y _n	1990-2012	25	0.9928	1.90
t-ratio	-0.26	23.30				
Panel B: Senior Spending Elasticity Models Based on Personal Income						
Dependent Variable	Constant	Explanatory Variable	Period	N	Adj. R ₂	Durbin-Watson
3) Log _c (S _b)	-14.2256	1.4654 Log _c Y _b	2002-2013	12	0.9928	1.91
t-ratio	-3.97	8.18				
4) Log _c (S _b)	-15.5994	1.5403 Log _c Y _n	2002-2012	11	0.9914	1.92
t-ratio	-3.79	7.40				
5) Log _c (S _n)	-13.3278	1.4154 Log _c Y _b	2002-2013	12	0.9927	1.88
t-ratio	-3.02	6.43				
6) Log _c (S _n)	-14.7283	1.4763 Log _c Y _n	2002-2012	11	0.9926	1.89
t-ratio	-2.82	5.375				
Panel C: Senior Spending Elasticity Models Based on Number of Seniors						
Dependent Variable	Constant	Explanatory Variable	Period	N	Adj. R ₂	Durbin-Watson
7) Log _c (S _n)	-13.2729	3.7313 Log _c Elderly	2002-2013	12	0.9933	1.51
t-ratio	-1.04	2.22				
8) Log _c (S _b)	-13.3619	3.7560 Log _c Elderly	2002-2013	12	0.9949	1.49
t-ratio	-1.05	2.24				

Source: Authors' calculations with Stata Prais procedure, which corrects for autocorrelation. The final Durbin-Watson test statistics are displayed.

between \$5.8 billion and \$7.6 billion, while the tax expenditures through the exclusion of private and public retirement income from the personal income tax base for the elderly in 2025 could be between \$5.4 billion and \$7.1 billion, or the same order of magnitude of additional spending out of the general fund.

One way to finance the additional spending on seniors out of the general fund would be to subject private and public retirement income to the state's personal income tax and thereby redistribute financing responsibilities for greater medical assistance spending to those seniors above the poverty line.

We hope that this empirical investigation into what likely will be spent on seniors out of the general fund and off budget, and the fact that exclusion of retirement income is of the same order of magnitude as those expenditures, will encourage state policymakers to begin the difficult process of educating the public about the need to rethink the exclusion of retirement income from the Pennsylvania personal income tax, and to remind all stakeholders that the

graying of the state over the next decade must mean that the obligations to the elderly through the provision of long-term care must be matched by a will to finance it. Medical science is extending lives, and we know that as the population over age 65 grows absolutely and relatively, dependency must rise. It is likely that the expenditure tendencies we have measured and predicted are prevalent across the country, although few states will experience the demographic change that Pennsylvania is likely to witness in the next 10 to 15 years.

The dramatic increase in the number of seniors will likely have other, broader effects on Pennsylvania's civil society. For example, legal institutions charged with the transfer of property ownership through the probate process could find themselves overwhelmed with a much higher volume of ownership changes, while at the same time, the level of conflict among beneficiaries could rise as well. Issues of the treatment of the incompetent could also arise, and could pose additional challenges to law enforcement as it responds to claims of abuse and neglect.

Table 13.
Predicted Tax Expenditures (2014-2030) for Seniors in \$Millions and Index₂₀₁₃ = 1 Under Alternative Growth Rate Assumptions From Historical Patterns of Growth in Table 15.

Year	Predicted Tax Expenditure g = 4.0% (\$millions)	Predicted Tax Expenditure g = 4.0% (2013 = 1.00)	Predicted Tax Expenditure g = 4.6% (\$millions)	Predicted Tax Expenditure g = 4.6% (2013 = 1.00)	Predicted Tax Expenditure g = 4.8% (\$millions)	Predicted Tax Expenditure g = 4.8% (2013 = 1.00)	Predicted Tax Expenditure g = 6.3% (\$millions)	Predicted Tax Expenditure g = 6.3% (2013 = 1.00)
2013	2,449	1.00	2,449	1.00	2,449	1.00	2,449	1.00
2014	2,620	1.07	2,635	1.08	2,640	1.08	2,678	1.09
2015	2,799	1.14	2,831	1.16	2,842	1.16	2,924	1.19
2016	2,997	1.22	3,049	1.25	3,066	1.25	3,200	1.31
2017	3,206	1.31	3,280	1.34	3,305	1.35	3,499	1.43
2018	3,426	1.40	3,526	1.44	3,560	1.45	3,822	1.56
2019	3,661	1.50	3,790	1.55	3,834	1.57	4,175	1.71
2020	3,908	1.60	4,068	1.66	4,123	1.68	4,554	1.86
2021	4,181	1.71	4,378	1.79	4,446	1.82	4,981	2.03
2022	4,472	1.83	4,709	1.92	4,791	1.96	5,445	2.22
2023	4,777	1.95	5,060	2.07	5,158	2.11	5,945	2.43
2024	5,100	2.08	5,433	2.22	5,548	2.27	6,487	2.65
2025	5,443	2.22	5,832	2.38	5,967	2.44	7,076	2.89
2026	5,766	2.35	6,213	2.54	6,369	2.60	7,662	3.13
2027	6,106	2.49	6,618	2.70	6,797	2.78	8,293	3.39
2028	6,464	2.64	7,046	2.88	7,251	2.96	8,974	3.67
2029	6,841	2.79	7,500	3.06	7,733	3.16	9,707	3.96
2030	7,238	2.96	7,981	3.26	8,245	3.37	10,498	4.29

Source: Authors' calculations.

Table 14.
Predicted Seniors' Expenditures out of the General Fund Based on Elasticity Analysis and 2.5 Percent Narrowly Defined Personal Income Growth

Year	Predicted S _n Personal Income g = 0.025 Expenditure Elasticity = 1.41 Model 5 from Table 12 (\$billions)	Predicted S _n Personal Income g = 0.025 Expenditure Elasticity = 1.41 Model 5 from Table 12 (2013 = 1.00)	Predicted S _b Personal Income g = 0.025 Expenditure Elasticity = 1.54 Model 5 from Table 12 (\$billions)	Predicted S _b Personal Income g = 0.025 Expenditure Elasticity = 1.54 Model 5 from Table 12 (2013 = 1.00)
2013	3.787	1.00	4.970	1.00
2014	3.922	1.04	5.163	1.04
2015	4.061	1.07	5.363	1.08
2016	4.205	1.11	5.571	1.12
2017	4.353	1.15	5.787	1.16
2018	4.508	1.19	6.011	1.21
2019	4.667	1.23	6.244	1.26
2020	4.833	1.28	6.486	1.30
2021	5.004	1.32	6.738	1.36
2022	5.181	1.37	6.999	1.41
2023	5.365	1.42	7.270	1.46
2024	5.555	1.47	7.552	1.52
2025	5.752	1.52	7.844	1.58

Source: Authors' calculations.

Table 15.
Tax Expenditure Per Elderly Person, 1990-2013

Year	Tax Expenditure Per Elderly	Tax Expenditure Per Elderly (1900 = 1.00)	Percentage Change In Average Per Elderly Tax Expenditure (g)
1990	\$324	1.00	NA
1991	\$349	1.08	7.6%
1992	\$546	1.69	56.3%
1993	\$465	1.44	-14.8%
1994	\$500	1.54	7.6%
1995	\$552	1.70	10.2%
1996	\$553	1.71	0.2%
1997	\$560	1.73	1.3%
1998	\$592	1.83	5.8%
1999	\$656	2.02	10.8%
2000	\$694	2.14	5.8%
2001	\$727	2.24	4.8%
2002	\$784	2.42	7.7%
2003	\$833	2.57	6.3%
2004	\$941	2.90	12.9%
2005	\$959	2.96	1.9%
2006	\$994	3.07	3.7%
2007	\$988	3.05	-0.6%
2008	\$1,018	3.14	3.0%
2009	\$1,111	3.43	9.2%
2010	\$1,147	3.54	3.2%
2011	\$1,168	3.60	1.9%
2012	\$1,159	3.58	-0.8%
2013	\$1,171	3.61	1.0%

Source: Authors' calculations with Table 11, and data underlying Figure 1.

Table 16.
Predicted Narrow Seniors Expenditures out of the General Fund and Off Budget Based on Observed Growth Rates in Seniors Expenditures

Year	S_n g = 3.0% (\$billions)	S_n g = 3.0% (2013 = 1.00)	S_n g = 5.0% (\$billions)	S_n g = 3.0% (2013 = 1.00)
2013	4.233	1.00	4.233	1.00
2014	4.360	1.03	4.445	1.05
2015	4.491	1.06	4.667	1.10
2016	4.625	1.09	4.900	1.16
2017	4.764	1.13	5.145	1.22
2018	4.907	1.16	5.402	1.28
2019	5.054	1.19	5.673	1.34
2020	5.206	1.23	5.956	1.41
2021	5.362	1.27	6.254	1.48
2022	5.523	1.30	6.567	1.55
2023	5.689	1.34	6.895	1.63
2024	5.859	1.38	7.240	1.71
2025	6.035	1.43	7.602	1.80

Source: Authors' calculations.

Table 17.
Predicted S_n and S_b Based on Elasticity Models From Models 7 and 8 in Table 11 and Predictions of Elderly Population From Census Bureau, Worst-Case Scenario

Year	S_n (\$billions)	S_n (2013 = 1.00)	S_b (\$billions)	S_b (2013 = 1.00)
2013	4.222	1.000	4.663	1.000
2014	4.686	1.110	5.179	1.111
2015	5.186	1.228	5.735	1.230
2016	5.781	1.369	6.397	1.372
2017	6.424	1.522	7.114	1.526
2018	7.118	1.686	7.887	1.691
2019	7.865	1.863	8.721	1.870
2020	8.668	2.053	9.618	2.063
2021	9.640	2.283	10.705	2.296
2022	10.691	2.532	11.879	2.548
2023	11.823	2.800	13.146	2.819
2024	13.040	3.089	14.509	3.112
2025	14.346	3.398	15.972	3.425

Source: Authors' calculations.

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