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# Pensionomics 2012

## Measuring the Economic Impact of DB Pension Expenditures

by Ilana Boivie

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## ABOUT THE AUTHOR

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# EXECUTIVE SUMMARY

Defined benefit (DB) pension benefits are highly valued by the retired Americans who count on these plans for a secure source of income in retirement. But the benefits provided by pension plans have an impact that reaches well beyond the retirees who receive pension checks.

Often overlooked is the vital role that DB pensions play in stimulating the U.S. economy and creating jobs. Virtually every state and local economy across the country is enhanced substantially from the spending of pension benefits. This economic stimulus is particularly important given the economic downturn and high unemployment rate in the wake of the Great Recession.

For example, when a retired nurse residing in the state of Minnesota receives a pension benefit payment, the steady, monthly benefit payment provides him/her with peace of mind and retirement security. But the benefits don't stop there. S/he spends the pension check on goods and services in the local community. S/he is likely to purchase food, clothing, and medicine at local stores, and may even make larger purchases like a car or computer. These purchases, coupled with those of other retirees with pensions, create an economic ripple effect. In short, pension spending supports the economy and creates jobs where retirees reside and spend their benefits.

Pension expenditures may be especially vital to small or rural communities, where other steady sources of income may not be readily found if the local economy lacks diversity.

Additionally, reliable pension income can be especially important in stabilizing local economies during economic downturns, because retirees know they are receiving a steady check despite economic conditions. In contrast, retirees only with 401(k)-type plans may be reluctant to spend down their nest egg, particularly if their savings are negatively impacted by market downturns. Retirees with a DB pension need not worry about reducing spending with every dip in the stock market.

This study analyzes data on DB pension plans in both the public and private sectors to assess the overall economic impact of benefits paid by these plans to retirees. For state and local plans, we analyze these impacts on a national level as well as in each of the fifty states.

The economic gains attributable to DB pension expenditures are quantifiable. This study finds that, in 2009:

- Over $426 billion in pension benefits were paid to nearly 19 million retired Americans. Of that:
  - » $187 billion was paid to some 8 million retired employees of state and local government and their beneficiaries (typically surviving spouses);
  - » $67.6 billion was paid to some 2.5 million federal government beneficiaries;
  - » $171.5 billion was paid to some 8.4 million private sector beneficiaries.
- Expenditures made out of those payments collectively supported:
  - » 6.5 million American jobs that paid nearly $315 billion in labor income;
  - » $1 trillion in total economic output nationwide;
  - » $553 billion in value added (GDP);
  - » $134 billion in federal, state, and local tax revenue.
- DB pension expenditures have large multiplier effects:
  - » For each dollar paid out in pension benefits, $2.37 in total economic output was supported.
  - » For every taxpayer dollar contributed to state and local pensions, $8.72 in total output was supported nationally.
- The largest employment impacts were seen in the food services, real estate, health care, and retail trade sectors.

# INTRODUCTION: DEFINED BENEFIT PENSION PLANS IN THE UNITED STATES

Defined benefit (DB) pension plans have existed in the United States since the 19th century.

In the private sector, the first defined benefit (DB) pension plan was introduced in 1875 by the American Express Company.[1] Over time, many private sector employers saw the value of offering DB pension coverage to their employees, as these benefits not only were quite valued by workers, but from a human resource management perspective, they also acted as an effective recruitment and retention tool.[2] Although private sector DB plans have experienced a decline in recent decades (due in large part to a difficult regulatory environment),[3] in 2005, 33% of private sector employees still had DB pension coverage.[4]

In the public sector, Congress created the Civil Service Retirement System (CSRS) to provide a pension for civilian federal employees in 1920. In 1986, Congress implemented the new Federal Employee Retirement System (FERS), which includes Social Security, a DB annuity, and a 401(k)-type savings plan, called the Thrift Savings Plan.[5] On the state and local level, employee pension systems began to take root on a large scale during the Great Depression. When Social Security was established in 1935, the system left out state and local workers, and many states acted to develop their own retirement systems for their employees. Between 1931 and 1950, nearly half of the large public employee pension plans existing today were established; 45 states had retirement systems in place by 1961.[6]

In 2009, state and local pension plans in the United States collectively held total assets of $2.5 trillion. They served 27.5 million Americans, including 14.8 million active participants, 4.6 million inactive members, and 8.0 million retirees and other beneficiaries receiving regular benefit payments. Total benefit payments in 2009 were $187 billion, for an average benefit payment of $1,950 per month, or $23,407 per year.[7]

Federal pension plans currently serve 2.3 million active civilian employees.[8] In 2009, Federal plans paid out some $67.6 billion in pension benefits to 2.5 million retirees and beneficiaries.[9] Private sector pension plans covered 44 million Americans,[10] including 8.4 million retired Americans in 2009.[11] With total plan assets of $2.2 trillion in 2009,[12] private DB pensions paid out some $171.5 billion in pension benefits to these retirees and beneficiaries.[13] The average private sector pension benefit was $1,691 per month, or $20,298 per year.

Table 1.
**Public and Private Sector Pension Benefits, 2009**

| | State and Local | Federal | Private Sector | Total* |
|---|---|---|---|---|
| Beneficiaries | 8.0 million | 2.5 million | 8.4 million | **18.9 million** |
| Total Benefits | $187.0 billion | $67.6 billion | $171.5 billion | **$426.2 billion** |
| Average Benefit | $23,407 | $27,081 | $20,298 | **$22,504**** |

*Sources:* U.S. Census Bureau State and Local Government Employee-Retirement Systems, U.S. Office of Personnel Management Federal Annuity Roll, U.S. Bureau of Labor Statistics Current Population Survey, and author's calculations.

*Totals may not add up exactly due to rounding.

** Total average benefit represents a weighted average of public and private sector benefits.

DB plans are prefunded systems, which means that a retirement fund receives regular contributions for each employee during the course of that person's career. This type of arrangement can be contrasted with "pay-as-you-go" systems like Social Security, whereby contributions of current employees are used to pay benefits for current retirees. Prefunded retirement systems have the advantage that investment earnings can do much of the work of paying for benefits. In such a system, the contributions made on behalf of current employees are invested, and these investment earnings compound over time. Over a span of decades, accumulation of investment earnings can be substantial, and in many cases pay the majority of the pension benefits.

In state and local government pension plans, typically both the employee and employer make contributions to the pension fund. Pension fund trustees have a fiduciary duty to ensure that the retirement fund is operating in the best interest of workers and retirees, and hire professional managers to oversee fund investments.[14] In this respect, public plans differ from private sector DB plans, which are generally funded solely by employers.

DB pensions are distinguishable from defined contribution (DC) plans (like 401(k) plans) in that they provide broad-based coverage, secure money for retirement, a lifetime income, and special protections for spouses.[15] Even after accounting for all of the significant advantages of a DB retirement system over DC accounts, research shows that DB plans are more economically efficient than DC plans. Pensions can deliver the same level of retirement benefits at nearly half the cost of a DC plan.[16]

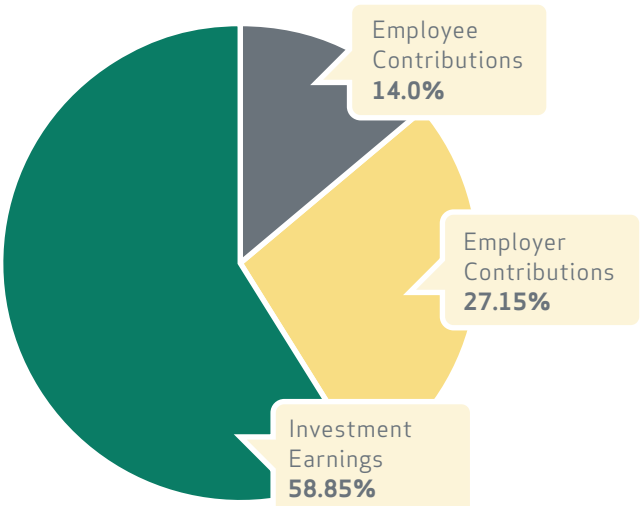
State and local pension fund receipts come from three sources: employer contributions, employee contributions, and earnings on investments. Figure 1 shows that between 1993 and 2009, 27.1% of public pension fund receipts came from employer contributions, 14.0% from employee contributions, and 58.9% from investment earnings. Earnings on investments—not taxpayer contributions—have historically made up the bulk of pension fund receipts, even though this time period saw two very large market downturns within a single decade.

Just as contributions from employees and employers have an expanded impact through the compounding of investment earnings over time, a similar dynamic occurs when retirees spend their pension checks. When a retiree receives a pension benefit, the money does not go under a mattress. Rather, the retiree spends it on goods and services in the local community. These expenditures have a "ripple effect" in the economy, as one person's expenditures become another person's income. Analyzing the size and nature of these ripple effects is the goal of our study.

## Measuring the National Economic Impact of DB Pension Plans

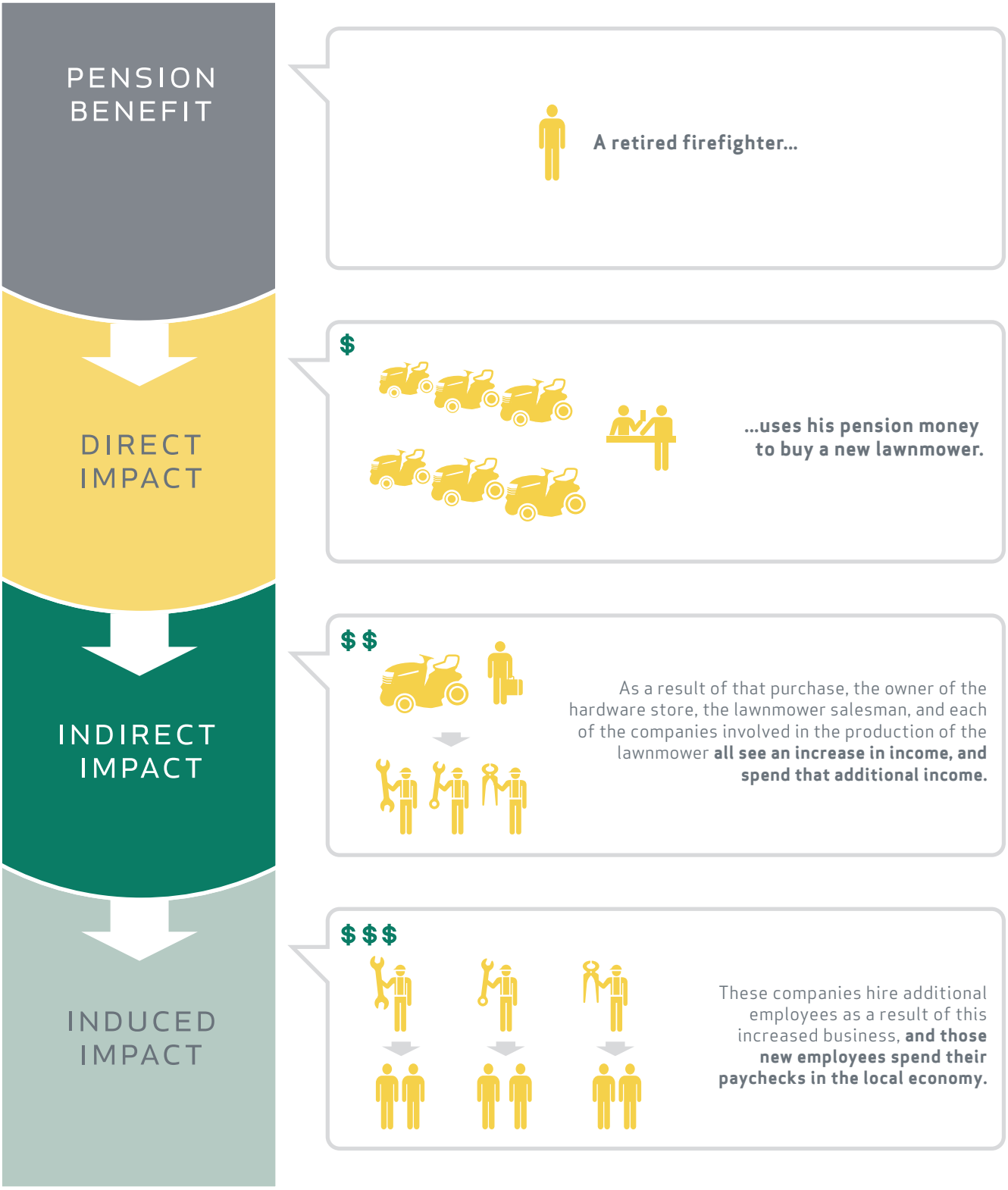
This study measures the economic impact of pension benefits paid by public and private pension plans nationally, as well as the economic effects of state and local plans within each state economy. Our analysis rests on the recognition that expenditures have a "multiplier" effect in a regional or national economy. When money is spent at a local business, that business sees an increase in revenue, thus boosting the economy initially. But that initial purchase generates even more local income, as shop owners will spend more money at other local businesses, purchasing more input goods to make additional products.

Figure 1:
**Aggregate State and Local Pension Contributions by Source, 1993-2009**




*Source:* Author's calculations from U.S. Census Bureau State and Local Government Employee-Retirement Systems.

Figure 2:
**The Multiplier Effect: How Spending Ripples Through the Economy, Supporting Jobs and Incomes in the Process**



Then, those input business owners will also spend more money in the local economy to increase their production, and so on. Additionally, with the increase in revenue, local merchants may hire extra workers, further fueling the local economy. Thus, with each new round of spending, additional revenue is generated, expanding job creation, incomes, total output, and tax revenue to the local community, as illustrated in Figure 2.

Our analysis is focused on the expenditure effects of pension benefits, measuring the economic impacts that result when expenditures made by retirees ripple throughout the economy. Because pension benefits are permanent sources of income—in that they cannot be outlived—we would expect the economic impacts to be larger than those of temporary income increases.[17] For this reason, we would expect the economic impacts of pension benefit expenditures to be larger than those out of, for example, unemployment insurance benefit payments. It should also be noted that this study measures the gross economic impacts of pension benefit expenditures, rather than the net economic impacts. For a detailed explanation, see the Technical Appendix.

Because taxpayers and elected officials have an interest in gauging the ultimate economic impact of each tax dollar "invested" in a state or local pension plan, we calculate a proxy measurement of the total economic impact attributable to each dollar in pension contributions made by the taxpayer, called the "taxpayer investment factor." Details follow.

## Data and Methodology

The data used for our analysis comes primarily from two sources: the U.S. Census and IMPLAN. Data for 2009 was used, as it was the most recently available at the time of our analysis.

Data on state and local pension plans comes from the Census Bureau's State and Local Government Employee-Retirement System survey, which is a representative sample of state and local DB pension plans in the United States. This survey provides data on revenues, expenditures, financial assets, and membership for state and local pension plans on a national basis and in each of the 50 states.[18] Federal pension data comes from the Federal Annuity Roll, published by the U.S. Office of Personnel Management.[19] Data on private pension benefits comes from the Census Bureau and Bureau of Labor Statistics' Current Population Survey Annual Social and Economic (ASEC) Supplement, which reports sources of household income, including pension and survivor income, by age.[20]

To measure the economic impacts of retiree expenditures made out of benefits paid by DB pension plans, the input-output modeling software, IMPLAN, was used. IMPLAN was first developed in the 1970s as a part of a USDA Forest Service project to analyze the economic effects of local land management projects such as timber, mining, and recreation activities.[21] Since that time, IMPLAN has been used by industry and government analysts throughout the country to assess economic impacts of highly varied local community development projects; these studies include many recent economic impact studies of pension benefit payments from state retirement systems.[22]

Since NIRS' original *Pensionomics* study was published in 2009, IMPLAN has undergone significant modeling changes. Due to these changes, results of the current study are not directly comparable to those of the older study, and the reader should avoid drawing conclusions based on such comparisons. Detailed information on our data and methodology and further discussion of these differences appear in the Technical Appendix.

## ECONOMIC IMPACT MEASUREMENTS

We analyze the economic impact of expenditures made by retirees out of their DB pension payments along four dimensions: employment and labor income, output, value added, and tax revenues. Each of these is described in detail below.

**1. Employment and Labor Income Impact:** When retirees spend their pension checks, their expenditures help to support jobs—at the local diner, hospital, or even at a factory somewhere across the country. When a retiree makes a purchase, a business sees an increase in revenue. With enough of an increase, that business may be prompted to hire more workers. Using IMPLAN, we calculated the number of jobs supported by retirees' expenditures. We also present estimates of the direct, indirect, and induced employment impacts. The direct employment impact occurs when the initial benefit payment is spent by the retiree. The indirect impact occurs as a result of the additional income generated through the purchase of more goods and services by merchants receiving direct expenditures from retirees. The induced employment impact is attributable to the additional income generated through the purchase of goods and services by employees hired as a result of the direct and indirect impacts. In all cases, the employment impact estimates "annual average jobs" for that industry within a single year. We also present estimates of labor income supported by pension expenditures, which is a component of value added, as described below.

**2. Output Impact:** Total output includes the value of all goods and services produced in the economy. Using IMPLAN, we calculate the value of total output supported by retirees' expenditures of DB pension benefits. As with the employment effects, we present estimates of the impact on total output, broken down by direct, indirect, and induced impacts. The direct impact consists of the initial round of spending. Indirect impacts consist of those additional rounds of spending by the local merchants. Induced impacts are the additional outputs created when new employees, hired as a result of the direct and indirect spending rounds, spend their paychecks in the local economy.

We also calculate a pension expenditure multiplier and taxpayer investment factor. The pension expenditure multiplier tells us the total economic impact attributable to each dollar in pension benefits paid to a retiree. (For example, a multiplier of 2.2 means that every $1 paid to retirees in a local economy supports $2.20 of total output in that region.) We calculate the pension expenditure multiplier by dividing the total output (consisting of the direct, indirect, and induced impacts taken together) by the value of the "initial event" in the economy (in this case, the gross pension benefit being paid). Expenditure multipliers usually lie between 1.0 and 3.0.

**3. Value Added Impact:** Value added is a net estimate of the creation of "new value" in the economy. Commonly referred to as Gross Domestic Product (GDP), it includes the value of employee compensation, profits, rents, and other aspects of production, but excludes the costs of purchased materials and services. IMPLAN calculates the value added attributable to DB pension benefit expenditures.

**4. Tax Impact:** Economic activity of all kinds—receiving pension income, earning wages, producing profits, selling goods and services—provides the basis for the tax revenues that are required to fund government services. To calculate the impact that pension payments have on tax revenues, we first calculate the taxes paid by beneficiaries directly on their pension benefits. Then, using IMPLAN, we calculate estimates of taxes attributable to the economic activity that results when retirees' spend their pension checks and in all subsequent rounds of spending. This includes all corporate, property, and business taxes that are generated through each spending round.

# RESULTS: NATIONAL ECONOMIC IMPACT OF DB PENSION PLANS

Our analysis indicates that benefits paid by DB pension plans have a sizeable economic ripple effect. The impact on employment, income, output, value added, and tax revenues are large and reach well beyond the retirees who receive pension benefits from these plans.

## Employment and Income

The analysis finds that the $426.2 billion in gross public and private pension benefits paid out in 2009 supported 6.5 million American jobs, as shown in Table 2. Of these jobs, 2.9 million were supported by state and local pension benefit expenditures, 1.0 million by Federal pension expenditures, and an additional 2.6 million by private pension expenditures. Over 2.8 million were attributable to direct impacts (direct spending by retirees), 1.5 million to indirect impacts (additional spending rounds by merchants), and 2.3 million through induced impacts (additional jobs supported when employees, hired as a result of the direct and indirect spending rounds, spend their paychecks). These jobs collectively paid out an estimated $314.8 billion in labor income, as shown in in Table 3.

To put these employment impacts in perspective, the 6.5 million jobs supported by pensioners' expenditures is more than number of Americans that were employed in the entire construction industry, in which there were 6.3 million jobs in 2009.[23]

In addition, in 2009 the national unemployment rate was 9.3%. The entire labor force in the country consisted of 153.8 million potential workers, of whom 14.2 million were unemployed.[24] In light of these numbers, the fact that DB pension expenditures supported 6.5 million jobs is significant, as it represents a full 4.2 percentage points in the national labor force.

Table 2.
**DB Pensions Support 6.5 Million American Jobs**

| | State and Local Pensions (# Jobs) | Federal Pensions (# Jobs) | Private Pensions (# Jobs) | Total Jobs Supported* (# Jobs) |
|---|---|---|---|---|
| Direct Impact | 1,223,257 | 442,304 | 1,121,914 | 2,787,476 |
| Indirect Impact | 652,099 | 235,786 | 598,075 | 1,485,959 |
| Induced Impact | 989,764 | 357,878 | 907,765 | 2,255,407 |
| **Total Employment Impact** | **2,865,120** | **1,035,968** | **2,627,754** | **6,528,842** |

*Totals may not add up exactly due to rounding.

## Total Output

Our model further finds that the $426.2 billion in public and private pension benefit payments in 2009 supported just over $1.0 trillion dollars in overall economic output in the national economy, including $387.8 billion in direct impacts, $279.8 billion in indirect impacts, and $340.9 billion in induced impacts. $442.6 billion in economic activity stemmed from state and local pension benefit expenditures, $160 billion from Federal pension expenditures, and $405.9 billion from private pension benefit expenditures. See Table 4.

This is roughly equivalent to the total output contributed by the entire wholesale trade industry, which generated $1.0 trillion in total output in the national economy in 2009.[25]

## Value Added (GDP)

Retirees' expenditures of DB pension benefit payments supported $552.9 billion in value added to the national economy in 2009, including $242.6 billion supported by state and local pension benefits, $87.7 billion by Federal pension benefits, and an additional $222.5 supported by private pension benefit expenditures. See Table 5.

This is roughly the same amount of value added as was contributed by the entire finance and insurance industry, which generated $568.0 billion in value added in 2009.[26]

## Tax Revenue

In terms of tax revenue, the model finds that $134.0 billion in

Table 3. **DB Pensions Support $314.8 Billion in Labor Income**

| | From State and Local Pensions | From Federal Pensions | From Private Pensions | Total Labor Income Supported* |
|---|---|---|---|---|
| Direct Impact | $49.7 billion | $19.6 billion | $54.2 billion | $123.6 billion |
| Indirect Impact | 33.7 billion | 13.3 billion | 36.7 billion | 83.6 billion |
| Induced Impact | 43.3 billion | 17.1 billion | 47.2 billion | 107.6 billion |
| **Total Labor Income Impact** | **$126.7 billion** | **$50.0 billion** | **$138.2 billion** | **$314.8 billion** |

*Totals may not add up exactly due to rounding.

Table 4. **DB Pensions Support $1 Trillion in Total Economic Activity**

| | From State and Local Pensions | From Federal Pensions | From Private Pensions | Total Output Supported* |
|---|---|---|---|---|
| Direct Impact | $170.2 billion | $61.5 billion | $156.1 billion | $387.8 billion |
| Indirect Impact | 122.8 billion | $44.4 billion | 112.6 billion | 279.8 billion |
| Induced Impact | 149.6 billion | $54.1 billion | 137.2 billion | 340.9 billion |
| **Total Output Impact** | **$442.6 billion** | **160.0 billion** | **$405.9 billion** | **$1.0 trillion** |

*Totals may not add up exactly due to rounding.

total tax revenue was attributable to public and private pension expenditures in 2009, including $74.3 billion in federal tax revenue and $59.7 billion in state and local tax revenue. (See Tables 6 and 7.)

Tax revenue comes from two major sources: taxes paid by beneficiaries directly on their pension benefits and taxes resulting from expenditures made in the local economy (for example, sales taxes resulting from a retail purchase). Of the total tax revenue supported, $12.7 billion came from taxes paid by beneficiaries on their benefits and $121.2 billion from other tax revenues.

To put these numbers in perspective, the total federal tax revenue attributable to public pension benefit payments is more than the $70.2 billion the federal government spent on all elementary, secondary, and vocational education services, and social services, combined, in 2009.[27] The total state and

## Table 5. **DB Pensions Support $552.9 Billion in Value Added (GDP)**

| | From State and Local Pensions | From Federal Pensions | From Private Pensions | Total Value Added Supported* |
|---|---|---|---|---|
| Direct Impact | $94.7 billion | $34.2 billion | $86.9 billion | $215.8 billion |
| Indirect Impact | 64.1 billion | 23.2 billion | 58.8 billion | 146.0 billion |
| Induced Impact | 83.8 billion | 30.3 billion | 76.9 billion | 191.1 billion |
| **Total Value Added Impact** | **$242.6 billion** | **$87.7 billion** | **$222.5 billion** | **$552.9 billion** |

*Totals may not add up exactly due to rounding.

## Table 6. **DB Pensions Support $74.3 Billion in Federal Tax Revenue**

| | From State and Local Pensions | From Federal Pensions | From Private Pensions | Total Federal Tax Revenue* |
|---|---|---|---|---|
| Taxes Paid by Beneficiaries on Benefits | $3.2 billion | $1.1 billion | $2.9 billion | $7.2 billion |
| Tax Revenue Resulting from Retiree Expenditures | 29.4 billion | 10.6 billion | 27.0 billion | 67.0 billion |
| **Total Federal Tax Revenue Impact** | **$32.6 billion** | **$11.8 billion** | **$29.9 billion** | **$74.3 billion** |

*Totals may not add up exactly due to rounding.

## Table 7. **DB Pensions Support $59.7 Billion in State and Local Tax Revenue**

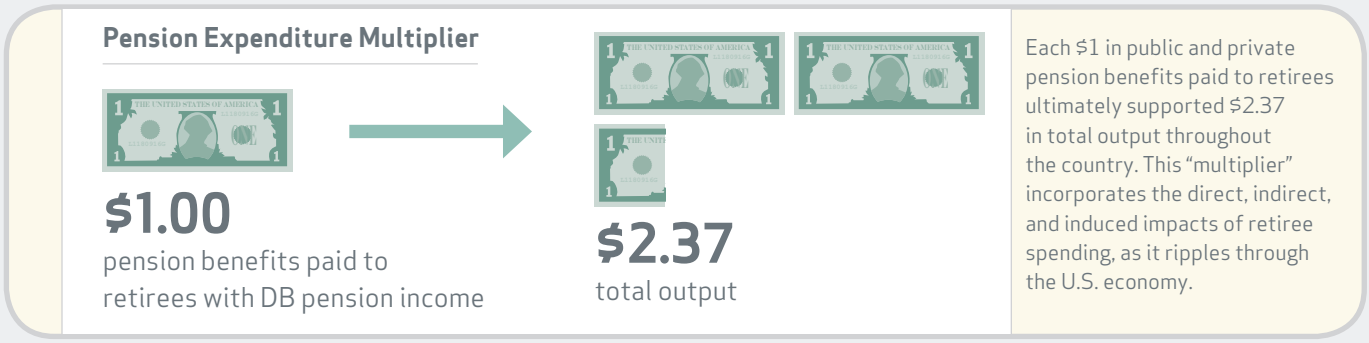
| | From State and Local Pensions | From Federal Pensions | From Private Pensions | Total State and Local Tax Revenue* |
|---|---|---|---|---|
| Taxes Paid by Beneficiaries on Benefits | $2.4 billion | $858.9 million | $2.2 billion | $5.5 billion |
| Tax Revenue Resulting from Retiree Expenditures | 23.8 billion | 8.6 billion | 21.8 billion | 54.2 billion |
| **Total State and Local Tax Revenue Impact** | **$26.2 billion** | **$9.4 billion** | **$24.0 billion** | **$59.7 billion** |

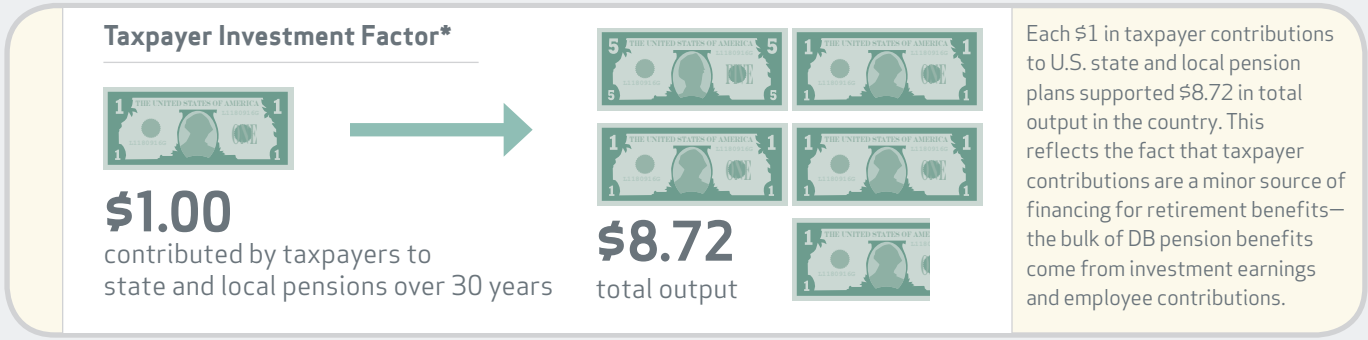
*Totals may not add up exactly due to rounding.

## Figure 3: **Economic Multipliers**

The pension expenditure multiplier for 2009 was 2.37, meaning that for every dollar paid out in DB pension benefits in that year, $2.37 of total output was generated in the national economy.

Because DB pension plans are prefunded, only a small portion of the total pension payment in any given year is funded through employer or taxpayer dollars, as discussed previously. Therefore, for state and local plans, it may be helpful to calculate the total impact of state and local pension benefit expenditures that is attributable to the "taxpayer investment" in these plans. That is, because only $0.27 of every dollar paid out in pension benefits is generated through taxpayer contributions, the taxpayer investment factor will be substantially higher than the expenditure multiplier. In 2009, for example, of the $187 billion paid out in public pension benefits, only $50.8 billion was funded by taxpayer dollars. The total economic impact attributable to state and local pension benefits was $442.6 billion. The taxpayer investment factor, then, was 8.72. For every taxpayer dollar contributed to state and local pension plans, national output increased by $8.72.




* Caution should be used in interpreting this number. See the Technical Appendix for details.

local tax revenue supported is roughly equivalent to what states collectively spent on all health services, and is roughly $10 billion more than states collectively spent on all corrections in that year.[28]

## Economic Impacts by Industry

Table 8 breaks down the economic effects of public and private pension expenditures by the top ten industry sectors affected. Nationally, the largest employment impacts were seen in the food services, real estate, health care, and retail trade sectors. In 2009 pension expenditures supported nearly 604 thousand jobs in the combined private hospitals and offices of physicians, dentists, and other health practitioners industries, over 535 thousand total jobs in the food services and drinking places industry, and nearly 419 thousand jobs in the real estate establishments industry.

### Table 8. Top Ten Industries by National Employment Impact

| | Total Employment Impact (# jobs) | | | | Total Output Impact | | | |
|---|---|---|---|---|---|---|---|---|
| **Industry** | From State and Local Pensions | From Federal Pensions | From Private Pensions | **Total*** | From State and Local Pensions | From Federal Pensions | From Private Pensions | **Total*** |
| Food services and drinking places | 234,872 | 84,925 | 215,414 | **535,211** | $14.6 b | $5.3 b | $13.4 b | **$33.3 b** |
| Real estate establishments | 183,835 | 66,471 | 168,605 | **418,910** | 29.3 b | 10.6 b | 26.8 b | **$66.7 b** |
| Private hospitals | 141,649 | 51,217 | 129,914 | **322,781** | 21.4 b | 7.8 b | 19.7 b | **$48.9 b** |
| Offices of physicians, dentists, and other health practitioners | 123,359 | 44,604 | 113,139 | **281,101** | 17.4 b | 6.3 b | 16.0 b | **$39.7 b** |
| Nursing and residential care facilities | 115,075 | 41,609 | 105,542 | **262,226** | 7.6 b | 2.8 b | 7.0 b | **$17.4 b** |
| Wholesale trade businesses | 81,355 | 29,416 | 74,615 | **185,386** | 15.4 b | 5.6 b | 14.1 b | **$35.1 b** |
| Private household operations | 70,624 | 25,536 | 64,773 | **160,933** | 616.6 m | 222.9 m | 565.5 m | **$1.4 b** |
| Retail Stores - General merchandise | 59,616 | 21,556 | 54,677 | **135,848** | 3.2 b | 1.2 b | 2.9 b | **$7.3 b** |
| Retail Stores - Food and beverage | 59,580 | 21,543 | 54,644 | **135,768** | 3.5 b | 1.3 b | 3.2 b | **$8.0 b** |
| Securities, commodity contracts, investments, and related activities | 55,331 | 20,007 | 50,747 | **126,085** | 4.6 b | 1.6 b | 4.2 b | **$10.4 b** |

*Totals may not add up exactly due to rounding.

## MEASURING STATE-LEVEL ECONOMIC IMPACTS OF STATE AND LOCAL PENSION BENEFITS

Next, we consider the specific economic impacts of state and local pension benefit expenditures within each state. Note that these impacts are calculated for state and local pension benefits only, and not Federal or private sector benefits. This is simply due to the data limitations on Federal and private pension plans.

The economic impacts and multipliers for individual states are collectively smaller than the national impacts and multipliers, because state economies are generally smaller and less diverse than the national economy as a whole.

The smaller and more homogeneous any local economy is, the smaller the economic multipliers will be for that economy, since input-output economic analysis takes into account local production patterns, eliminating from any local economy's total output that which leaves the state.

For example, if a consumer in the state of Alabama purchases a new lawnmower, that purchase is broken down into its various components of production: the engineers and designers, the parts manufacturers, and the retail salesperson all receive a portion of the revenue from that sale. Because the lawnmower was purchased within Alabama, the portion of output due the retailer will certainly be added to Alabama's total output. If the lawnmower was designed in Michigan and manufactured in Ohio, however, output from these services would not be included in Alabama's total output, because they were not performed within the state of Alabama. Because most individual state economies are not nearly as diverse as the U.S. economy as a whole, the state-level multipliers will be smaller than the national multipliers. On the other hand, whenever American companies and employees perform all of the services in any single transaction, they are accounted for in the national economic impacts.

Leakage is another reason why national multipliers are larger than their state-level counterparts. Upon retirement, not all employees continue to reside in their home states. When a pension beneficiary moves out of state, s/he takes his/her pension payments, spending those pension checks in the new state of residence, rather than in the state where the pension payment originated. Depending on the level of analysis, such a move may be considered a leakage, because any income that is spent out of state is lost to the state of origin in terms of adding to total economic output, and therefore the value added, employment, and expenditure multiplier of the state of origin.

Because we are interested in assessing the economic impacts of state and local pension benefits nationally, we employ an approach that accounts for the fact that one state's "loss" is another state's "gain." That is, just as some retirees might leave Kentucky to move to other states, retirees from other states might also make the move to Kentucky. Clearly some states, such as those in the Sunbelt, might have more retirees come into the state than leave the state, while others might find the number of retirees leaving the state is greater than the number moving in.

Using Census data on migration patterns of older households, we adjust for the net flows of retirees and their pension payments across state borders. In this way, we can estimate the economic impact of benefits spent by both retirees who reside within their state of origin as well as those retirees who move out of state. Retirees who live and therefore spend their income outside of their state of origin contribute to economic activity in their new state of residence. Similarly, we account for leakage due to interstate commerce by utilizing a Multi-Regional Input-Output analysis for each of the fifty states.

Thus, each state's total economic impacts consist of net in-state impacts (attributable to pension payment expenditures originating in the state) and net out-of-state impacts (attributable to pension expenditures originating from any of the other forty-nine states). For more information, see the Technical Appendix.

# RESULTS: NATIONAL ECONOMIC IMPACT OF DB PENSION PLANS

The following series of charts and tables provide the key state-level results of the economic impact analysis.

Not surprisingly, the state of California—with the largest economy of the 50 states—showed the largest employment, output, and value added impacts, with 324,671 total jobs, $52.5 billion in output, and $30.9 billion in value added supported by state and local pension benefit expenditures. But even in smaller states, the impacts of state and local pension benefits are substantial.

Figures 5 and 6 present the pension expenditure multipliers and taxpayer investment factors for each state. Pension expenditure multipliers vary somewhat by state, but generally speaking, larger states and those with more diverse economic bases will have larger multipliers than smaller states and those with a more homogeneous economic base. These multipliers account for the impact of pension expenditures originating both from within the state and those pension dollars that originate from another state but are spent within the state in question.

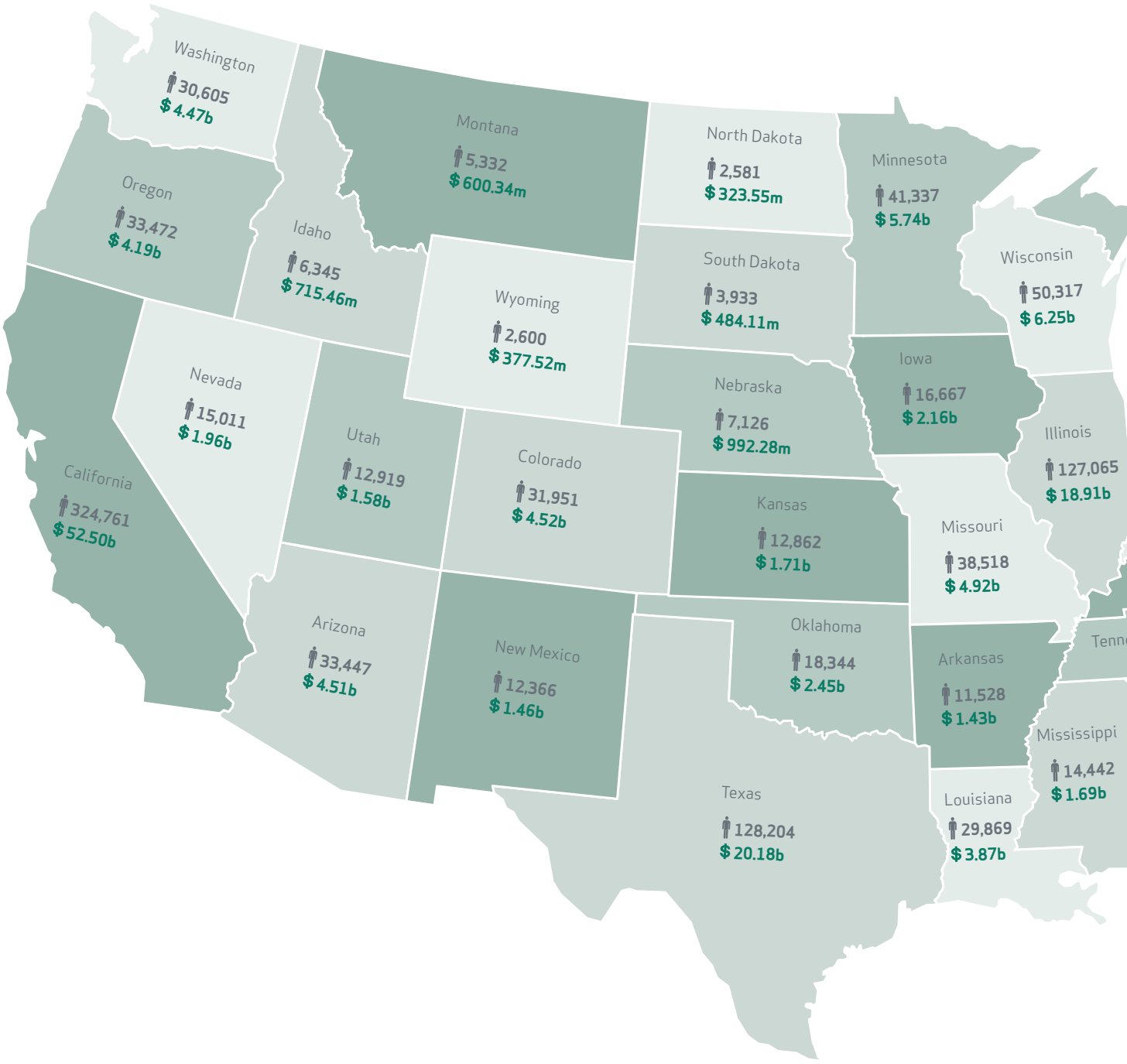
In 2009, the average pension expenditure multiplier was 1.48, meaning that for every dollar paid out in pension benefits by a state or local pension plan, $1.48 in total output was supported within that state, on average. The state with the largest pension expenditure multiplier was Texas, with a total output multiplier of 1.98; again, this is to say that every dollar in pension benefits paid out in Texas supports $1.98 in total economic output in that state.

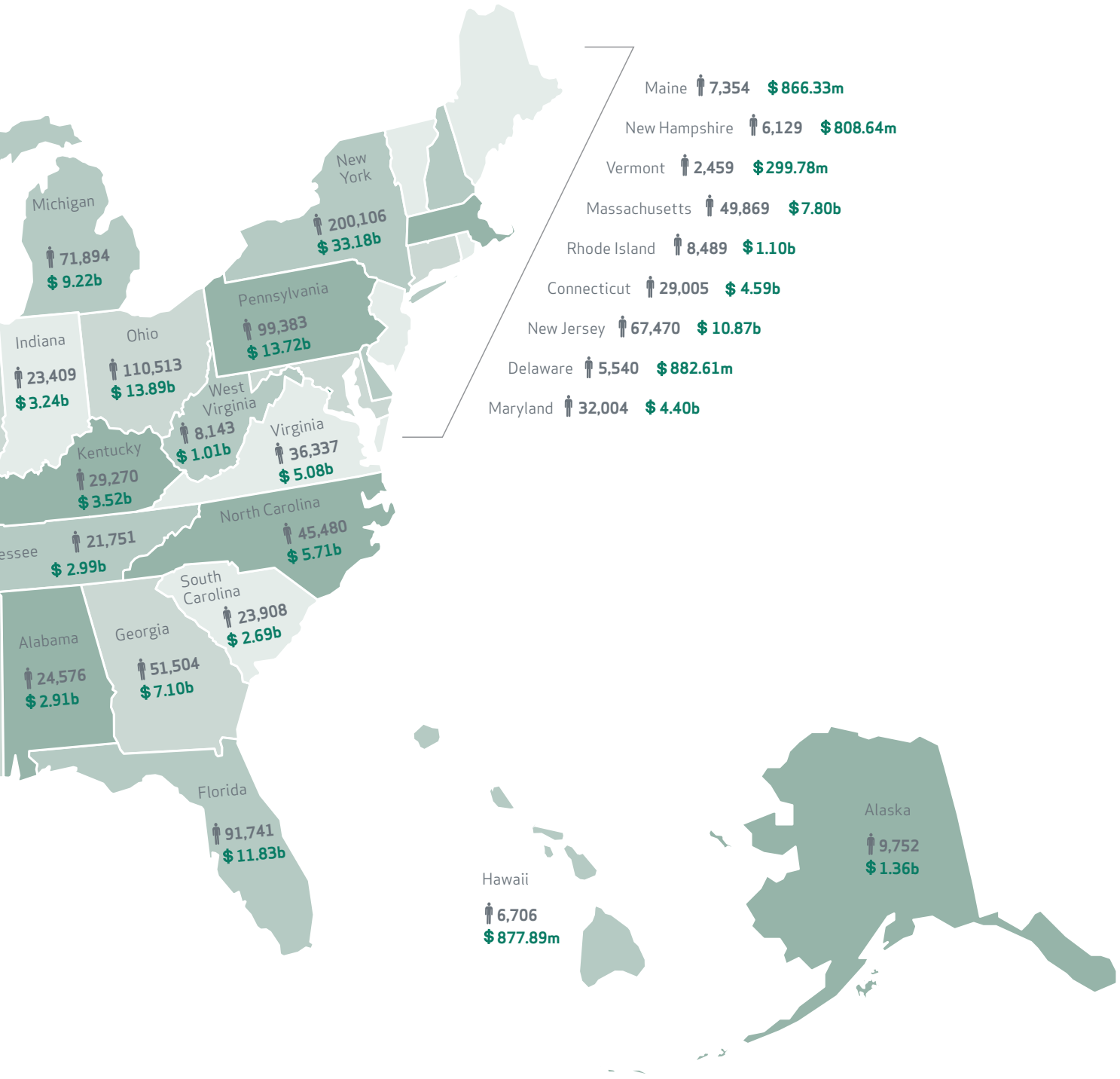
As is the case at the national level, the taxpayer investment factors for each state are much larger than the pension expenditure multipliers.

Because state and local pension plans are prefunded, only a small portion of the total pension payment in any given year is funded through taxpayer dollars. The total impact of state and local pension benefit expenditures that is attributable to the "taxpayer investment" in these plans is shown in Figure 6. In 2009, the average taxpayer investment factor was 5.52, meaning that for every dollar contributed by taxpayers in a single state, $5.52 in total economic output was supported within that state, on average. The states with the largest taxpayer investment factors were North Carolina and Texas, at 9.93; again, this is to say that every dollar contributed by taxpayers to these pension plans supported $9.93 in total economic output within that state.

Note that caution should be used in interpreting the taxpayer investment factor for some states. See the Technical Appendix for details.

Figure 4: **Employment and Economic Output Impacts by State**




Maine 7,354 $ 866.33m
New Hampshire 6,129 $ 808.64m
Vermont 2,459 $ 299.78m
Massachusetts 49,869 $ 7.80b
Rhode Island 8,489 $ 1.10b
Connecticut 29,005 $ 4.59b
New Jersey 67,470 $ 10.87b
Delaware 5,540 $ 882.61m
Maryland 32,004 $ 4.40b
Michigan 71,894 $ 9.22b
New York 200,106 $ 33.18b
Pennsylvania 99,383 $ 13.72b
Indiana 23,409 $ 3.24b
Ohio 110,513 $ 13.89b
West Virginia 8,143 $ 1.01b
Virginia 36,337 $ 5.08b
Kentucky 29,270 $ 3.52b
North Carolina 45,480 $ 5.71b
21,751 $ 2.99b
South Carolina 23,908 $ 2.69b
Alabama 24,576 $ 2.91b
Georgia 51,504 $ 7.10b
Florida 91,741 $ 11.83b
Hawaii 6,706 $ 877.89m
Alaska 9,752 $ 1.36b

## Table 9. **Employment Impacts by State (# jobs)**

| | # Jobs |
|---|---|
| Alabama | 24,576 |
| Alaska | 9,752 |
| Arizona | 33,447 |
| Arkansas | 11,528 |
| California | 324,761 |
| Colorado | 31,951 |
| Connecticut | 29,005 |
| Delaware | 5,540 |
| Florida | 91,741 |
| Georgia | 51,504 |
| Hawaii | 6,706 |
| Idaho | 6,345 |
| Illinois | 127,065 |
| Indiana | 23,409 |
| Iowa | 16,667 |
| Kansas | 12,862 |
| Kentucky | 29,270 |
| Louisiana | 29,869 |
| Maine | 7,354 |
| Maryland | 32,004 |
| Massachusetts | 49,869 |
| Michigan | 71,894 |
| Minnesota | 41,337 |
| Mississippi | 14,442 |
| Missouri | 38,518 |

| | # Jobs |
|---|---|
| Montana | 5,332 |
| Nebraska | 7,126 |
| Nevada | 15,011 |
| New Hampshire | 6,129 |
| New Jersey | 67,470 |
| New Mexico | 12,366 |
| New York | 200,106 |
| North Carolina | 45,480 |
| North Dakota | 2,581 |
| Ohio | 110,513 |
| Oklahoma | 18,344 |
| Oregon | 33,472 |
| Pennsylvania | 99,383 |
| Rhode Island | 8,489 |
| South Carolina | 23,908 |
| South Dakota | 3,933 |
| Tennessee | 21,751 |
| Texas | 128,204 |
| Utah | 12,919 |
| Vermont | 2,459 |
| Virginia | 36,337 |
| Washington | 30,605 |
| West Virginia | 8,143 |
| Wisconsin | 50,317 |
| Wyoming | 2,600 |

## Table 10. Income and Value Added Impacts by State (in millions)

| | Income | Value Added |
|---|---|---|
| Alabama | $909.9 | $1,625.1 |
| Alaska | 442.0 | 789.0 |
| Arizona | 1,479.7 | 2,688.8 |
| Arkansas | 437.3 | 757.2 |
| California | 17,386.8 | 30,857.1 |
| Colorado | 1,471.1 | 2,714.3 |
| Connecticut | 1,656.0 | 2,899.3 |
| Delaware | 260.3 | 479.0 |
| Florida | 3,910.3 | 7,042.2 |
| Georgia | 2,259.8 | 4,138.0 |
| Hawaii | 268.2 | 509.5 |
| Idaho | 216.8 | 381.8 |
| Illinois | 6,315.5 | 11,046.2 |
| Indiana | 966.6 | 1,689.1 |
| Iowa | 633.2 | 1,110.2 |
| Kansas | 507.2 | 910.6 |
| Kentucky | 1,109.4 | 1,947.2 |
| Louisiana | 1,163.8 | 2,041.8 |
| Maine | 285.5 | 485.4 |
| Maryland | 1,518.4 | 2,684.7 |
| Massachusetts | 2,822.2 | 4,788.4 |
| Michigan | 2,998.0 | 5,343.3 |
| Minnesota | 1,861.7 | 3,270.9 |
| Mississippi | 510.5 | 906.4 |
| Missouri | 1,620.8 | 2,792.8 |

| | Income | Value Added |
|---|---|---|
| Montana | $175.4 | $327.9 |
| Nebraska | 292.5 | 499.5 |
| Nevada | 667.4 | 1,216.5 |
| New Hampshire | 279.9 | 485.4 |
| New Jersey | 3,726.6 | 6,543.4 |
| New Mexico | 469.2 | 832.9 |
| New York | 11,919.7 | 20,696.1 |
| North Carolina | 1,838.6 | 3,221.1 |
| North Dakota | 97.6 | 169.1 |
| Ohio | 4,521.4 | 7,924.7 |
| Oklahoma | 727.9 | 1,350.5 |
| Oregon | 1,379.9 | 2,405.8 |
| Pennsylvania | 4,611.0 | 7,872.8 |
| Rhode Island | 382.4 | 660.0 |
| South Carolina | 837.3 | 1,525.6 |
| South Dakota | 144.0 | 256.2 |
| Tennessee | 962.8 | 1,650.9 |
| Texas | 6,037.3 | 11,179.5 |
| Utah | 486.1 | 865.1 |
| Vermont | 96.2 | 163.6 |
| Virginia | 1,697.5 | 3,041.2 |
| Washington | 1,449.9 | 2,549.0 |
| West Virginia | 310.5 | 548.3 |
| Wisconsin | 2,046.2 | 3,475.6 |
| Wyoming | 105.9 | 205.5 |

Figure 5: **Pension Expenditure Multipliers by State**

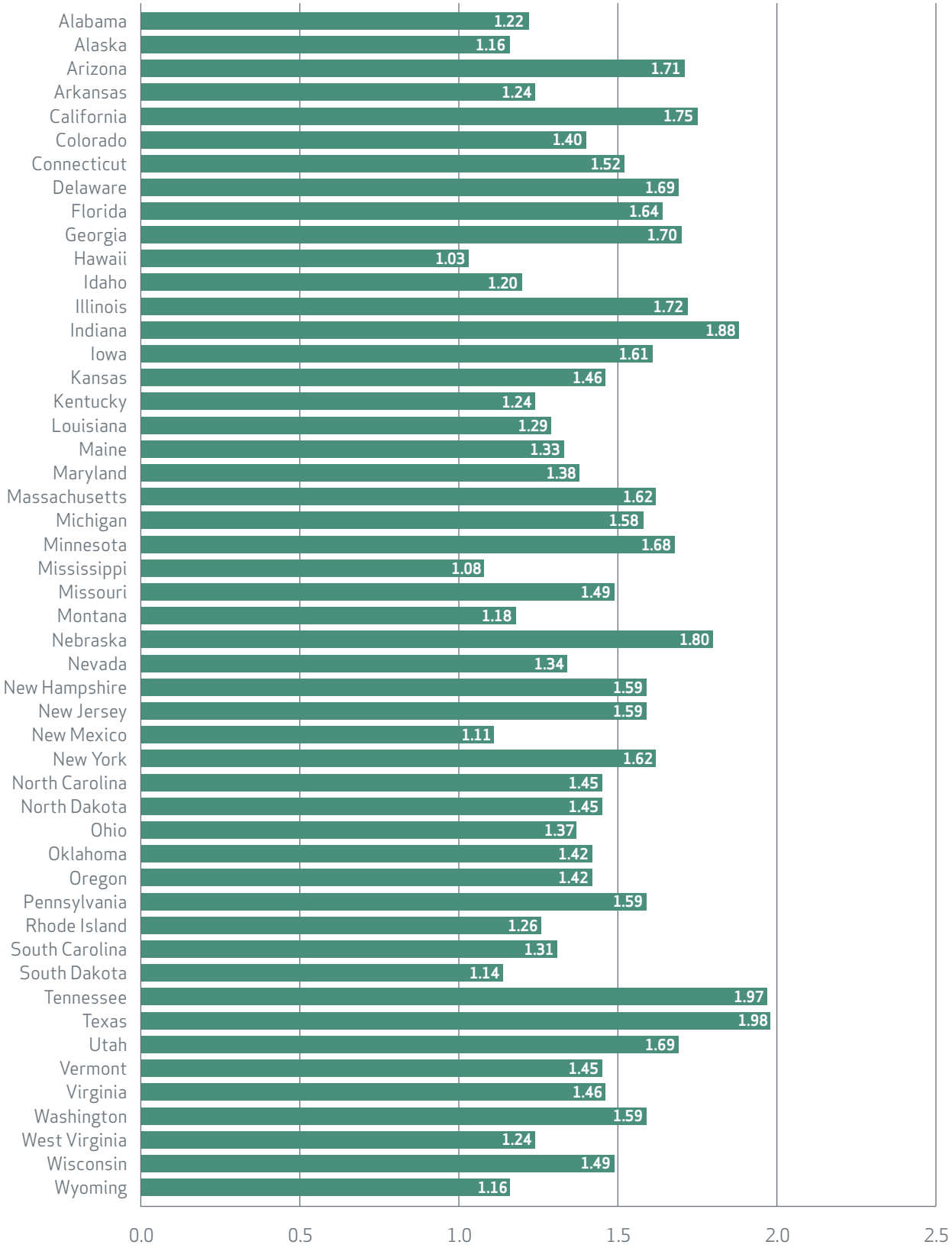
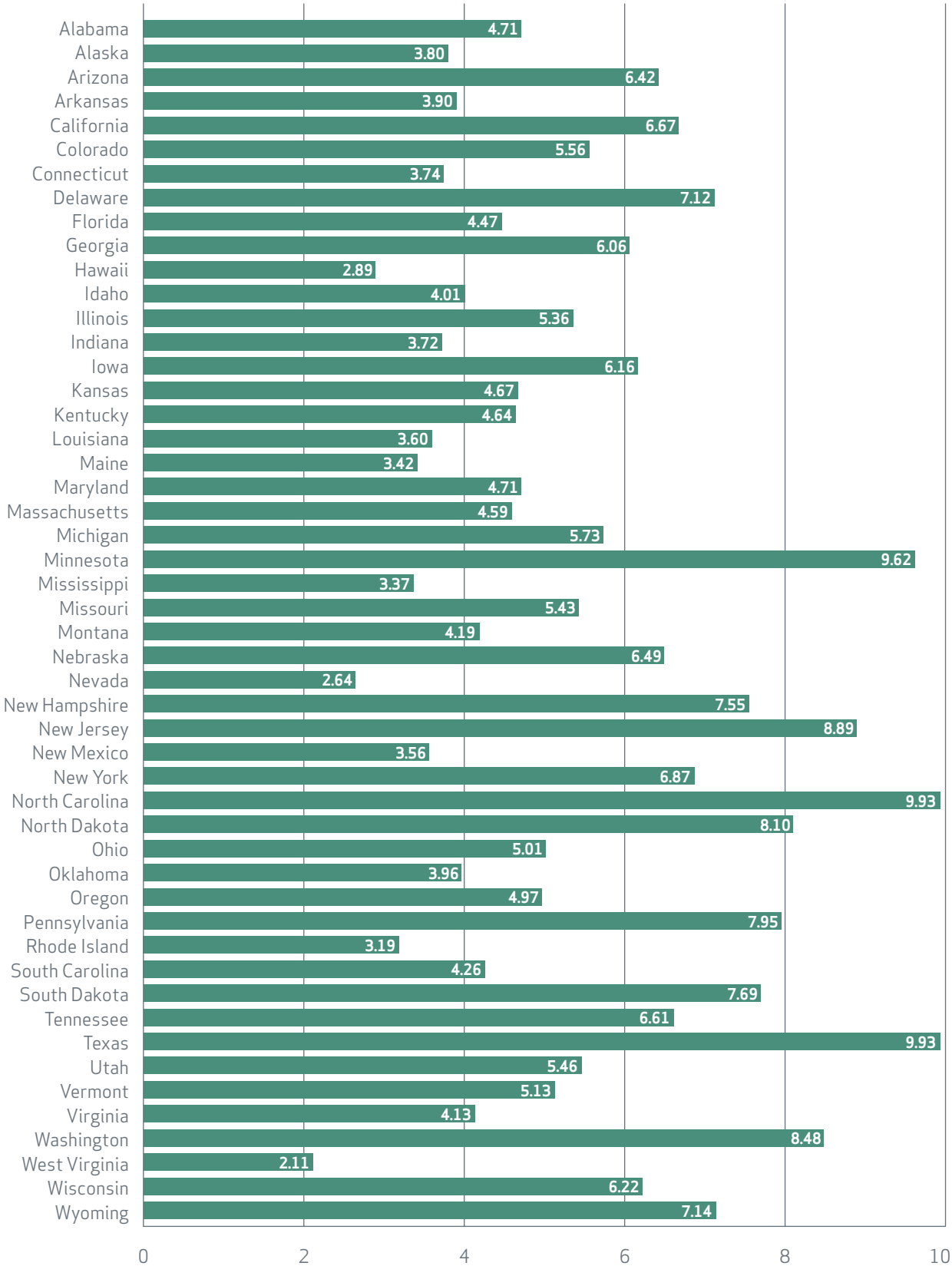


Figure 6: **Taxpayer Investment Factors by State**



## Table 11. **Direct, Indirect, and Induced Output Impacts by State (in millions)**

| | Output Supported (in $millions) | | | |
|---|---|---|---|---|
| | **Direct** | **Indirect** | **Induced** | **Total*** |
| Alabama | $1,461.7 | $794.1 | $654.0 | **$2,909.9** |
| Alaska | 762.2 | 326.8 | 269.8 | **1,358.7** |
| Arizona | 1,917.7 | 1,326.3 | 1,265.2 | **4,509.2** |
| Arkansas | 678.7 | 455.4 | 296.4 | **1,430.6** |
| California | 24,007.8 | 14,364.2 | 14,130.9 | **52,502.9** |
| Colorado | 2,165.4 | 1,287.7 | 1,068.2 | **4,521.2** |
| Connecticut | 2,117.9 | 1,301.3 | 1,175.8 | **4,595.0** |
| Delaware | 336.7 | 319.4 | 226.5 | **882.6** |
| Florida | 5,350.2 | 3,186.7 | 3,295.7 | **11,832.5** |
| Georgia | 2,962.6 | 2,233.2 | 1,905.5 | **7,101.3** |
| Hawaii | 519.5 | 200.2 | 158.1 | **877.9** |
| Idaho | 338.6 | 226.3 | 150.6 | **715.5** |
| Illinois | 8,548.2 | 5,135.0 | 5,227.4 | **18,910.5** |
| Indiana | 1,183.1 | 1,177.6 | 876.4 | **3,237.2** |
| Iowa | 845.2 | 786.1 | 531.5 | **2,162.8** |
| Kansas | 716.0 | 596.3 | 398.4 | **1,710.8** |
| Kentucky | 1,800.3 | 976.5 | 746.1 | **3,522.9** |
| Louisiana | 1,905.4 | 1,117.3 | 849.6 | **3,872.3** |
| Maine | 433.7 | 235.6 | 197.0 | **866.3** |
| Maryland | 2,187.1 | 1,176.3 | 1,032.4 | **4,395.8** |
| Massachusetts | 3,659.8 | 2,025.0 | 2,111.2 | **7,796.0** |
| Michigan | 4,407.1 | 2,411.9 | 2,403.7 | **9,222.6** |
| Minnesota | 2,546.5 | 1,652.9 | 1,540.1 | **5,739.4** |
| Mississippi | 900.8 | 446.3 | 340.5 | **1,687.5** |
| Missouri | 2,334.2 | 1,356.4 | 1,230.9 | **4,921.5** |

| | Output Supported (in $millions) | | | |
|---|---|---|---|---|
| | **Direct** | **Indirect** | **Induced** | **Total*** |
| Montana | $305.3 | $176.3 | $118.8 | **$600.3** |
| Nebraska | 349.1 | 395.9 | 247.4 | **992.3** |
| Nevada | 912.8 | 576.6 | 474.2 | **1,963.6** |
| New Hampshire | 354.8 | 235.9 | 217.9 | **808.6** |
| New Jersey | 4,949.8 | 3,228.2 | 2,695.0 | **10,873.0** |
| New Mexico | 781.3 | 369.8 | 307.5 | **1,458.6** |
| New York | 15,304.1 | 8,777.8 | 9,099.0 | **33,180.9** |
| North Carolina | 2,689.9 | 1,608.0 | 1,414.7 | **5,712.6** |
| North Dakota | 135.4 | 120.2 | 68.0 | **323.5** |
| Ohio | 7,047.0 | 3,492.6 | 3,345.9 | **13,885.6** |
| Oklahoma | 1,062.7 | 815.7 | 566.8 | **2,445.2** |
| Oregon | 2,079.9 | 1,079.8 | 1,025.6 | **4,185.3** |
| Pennsylvania | 6,461.7 | 3,575.1 | 3,683.3 | **13,720.0** |
| Rhode Island | 586.7 | 257.7 | 257.4 | **1,101.7** |
| South Carolina | 1,296.8 | 771.5 | 620.9 | **2,689.2** |
| South Dakota | 230.3 | 157.8 | 96.1 | **484.1** |
| Tennessee | 1,108.3 | 1,019.3 | 862.1 | **2,989.7** |
| Texas | 7,530.5 | 6,981.5 | 5,663.8 | **20,175.8** |
| Utah | 663.4 | 515.6 | 404.8 | **1,583.8** |
| Vermont | 135.6 | 96.6 | 67.5 | **299.8** |
| Virginia | 2,296.0 | 1,525.9 | 1,258.8 | **5,080.7** |
| Washington | 2,059.7 | 1,274.0 | 1,134.5 | **4,468.2** |
| West Virginia | 456.0 | 334.5 | 217.4 | **1,007.9** |
| Wisconsin | 2,969.8 | 1,686.8 | 1,593.0 | **6,249.7** |
| Wyoming | 151.5 | 150.2 | 75.8 | **377.5** |

*Totals may not add up exactly due to rounding.

## Table 12. **Tax Impacts by State (in millions)**

| | State/ Local | Federal | Total* |
|---|---|---|---|
| Alabama | $189.1 | $219.7 | **$408.8** |
| Alaska | 126.5 | 107.0 | **233.5** |
| Arizona | 302.2 | 348.5 | **650.7** |
| Arkansas | 133.7 | 96.5 | **230.3** |
| California | 3,281.0 | 4,405.9 | **7,686.9** |
| Colorado | 278.9 | 384.5 | **663.4** |
| Connecticut | 254.9 | 473.1 | **728.0** |
| Delaware | 93.3 | 57.0 | **150.2** |
| Florida | 635.3 | 961.2 | **1,596.5** |
| Georgia | 368.9 | 544.2 | **913.1** |
| Hawaii | 89.9 | 63.4 | **153.3** |
| Idaho | 56.0 | 49.1 | **105.1** |
| Illinois | 1,053.5 | 1,590.0 | **2,643.5** |
| Indiana | 184.2 | 224.6 | **408.8** |
| Iowa | 129.9 | 144.6 | **274.5** |
| Kansas | 96.1 | 123.9 | **220.0** |
| Kentucky | 251.1 | 259.2 | **510.4** |
| Louisiana | 218.0 | 263.7 | **481.7** |
| Maine | 101.2 | 58.7 | **159.9** |
| Maryland | 335.1 | 388.0 | **723.1** |
| Massachusetts | 434.0 | 719.3 | **1,153.3** |
| Michigan | 519.8 | 747.6 | **1,267.4** |
| Minnesota | 311.1 | 494.9 | **806.0** |
| Mississippi | 102.1 | 123.5 | **225.6** |
| Missouri | 264.6 | 375.4 | **640.1** |

| | State/ Local | Federal | Total* |
|---|---|---|---|
| Montana | $49.9 | $44.2 | **$94.0** |
| Nebraska | 76.1 | 59.9 | **136.0** |
| Nevada | 159.3 | 148.5 | **307.7** |
| New Hampshire | 96.4 | 62.1 | **158.5** |
| New Jersey | 614.6 | 997.1 | **1,611.7** |
| New Mexico | 90.9 | 113.0 | **203.8** |
| New York | 2,031.3 | 3,033.2 | **5,064.5** |
| North Carolina | 362.5 | 451.8 | **814.4** |
| North Dakota | 34.5 | 21.5 | **56.0** |
| Ohio | 988.1 | 1,042.3 | **2,030.4** |
| Oklahoma | 131.2 | 181.9 | **313.1** |
| Oregon | 336.0 | 332.4 | **668.4** |
| Pennsylvania | 636.0 | 1,172.3 | **1,808.3** |
| Rhode Island | 113.8 | 89.0 | **202.9** |
| South Carolina | 172.4 | 203.8 | **376.1** |
| South Dakota | 29.5 | 32.5 | **62.0** |
| Tennessee | 147.5 | 209.6 | **357.1** |
| Texas | 948.5 | 1,533.6 | **2,482.1** |
| Utah | 99.8 | 115.7 | **215.5** |
| Vermont | 41.6 | 19.6 | **61.2** |
| Virginia | 290.3 | 441.5 | **731.8** |
| Washington | 201.1 | 389.4 | **590.4** |
| West Virginia | 48.4 | 83.0 | **131.4** |
| Wisconsin | 351.8 | 504.9 | **856.7** |
| Wyoming | 18.2 | 30.7 | **48.9** |

*Totals may not add up exactly due to rounding.

# CONCLUSION

DB pension plans provide a critical source of reliable income for 18.9 million Americans. These plans are cost effective way to provide broad-based coverage, secure money for retirement, a lifetime income, and economic protections for retired Americans and their beneficiaries after a lifetime of work.

Often overlooked is the significant economic impact of DB pension plans, which reaches well beyond those who earned benefits during their working years. Because pensions supply secure income to retirees, pensions provide local economies with stable sources of revenue. Retirees who spend their paychecks regularly in their local economies—especially during tough economic times—are providing a stimulus to local business revenues and local workers' incomes.

These economic gains are quantifiable. Nationwide, over $1 trillion in total economic output was attributable to DB pension expenditures in 2009. DB expenditures supported 6.5 million American jobs that paid $314.8 billion in income to other Americans in that year. Benefits paid by DB pensions supported $134 billion in tax revenue at the local, state, and federal levels.

In supplying a stable source of income to retirees, DB pension plans support the national economy, as well as local economies throughout the country, with jobs, incomes, and tax revenue. Especially in these times of financial crisis and economic instability, pension benefits play an important role in providing a stable, reliable source of income not just for retired Americans, but also for the local economies in which their retirement checks are spent.

## DB Pension Data

State and local pension benefit payments were taken from the U.S. Census Bureau's State and Local Government Employee-Retirement System survey, which reports on state and local government-sponsored pension plans in the United States. The Census provides data on revenues, expenditures, financial assets, and membership in public employee retirement systems.[29] Census aggregates plan level data up to the state level, and these state-level estimates are based on a representative sample of retirement systems throughout the country, weighted for accuracy. Data for 2009 was used, as that was the most recent data available.

Federal pension data comes from the Federal Annuity Roll, published by the U.S. Office of Personnel Management.[30] Data on private pension benefits comes from the Census Bureau and Bureau of Labor Statistics' Current Population Survey Annual Social and Economic (ASEC) Supplement, which reports sources of household income, including pension and survivor income, by age.[31]

## Migration/Leakage

Upon retirement, not all workers continue to reside in their home states. When a pension beneficiary moves out of state, s/he takes the pension payments, spending those pension checks in the new state of residence, rather than in the state where the pension payment originated. Depending on the level of analysis, such a move may be considered a leakage, because any income that is spent out of state is lost to the state of origin in terms of adding to total economic output, and therefore the value added, employment, and expenditure multiplier of the state of origin. Of course, one state's "leakage" is another state's inflow, and since our analysis is concerned with measuring the economic impact of pension benefits, regardless of their community or state of origin or destination, we need to account for the movement of retirees from one state to another. To estimate the net effects of retiree movement across state borders, we use data from the 2009 American Community Survey, which offers micro-data on current state of residence by age as well as current residence one year ago by age.[32] From this, we are able to calculate the recent net migration patterns of people aged 65 and older. We assume that migration patterns for state and local government retirees mirror those of all other older Americans.

## Disposable Income and Taxation

Before calculating the economic impacts of pension benefit expenditures, we account for any and all taxes that are paid out of pension benefit payments. By doing so, we are able to utilize IMPLAN's institution spending pattern feature, which estimates household spending patterns by income class, and assumes that every dollar inputted into the model is spent.

Disposable income is calculated by subtracting income taxes from gross pension payments. To estimate federal income taxes due from state and local pension income, we use data from the Congressional Budget Office on effective federal income tax rates for elderly households in the United States by income quintiles.[33] Effective tax rates are different from marginal tax rates in that effective tax rates account for all tax deductions, credits, or other alterations that may change the total amount of the tax that any individual actually pays. This is more useful to our purposes, because, since we are using aggregated sample data, we cannot assess actual individuals' federal tax liabilities. The effective tax rate allows us to more accurately estimate the taxes that pension beneficiaries actually pay to the federal government.

State income taxes are estimated using rates reported in a study entitled *State Income Tax Treatment of the Elderly*, by Barbara Edwards and Sally Wallace, which calculates the effective tax rate for median income elderly households by state.[34] From this percentage, information from the National Conference of State Legislatures[35] is used to account for any public pension exclusions a state may provide. State income tax exclusions are important to consider, because many states offer full or partial income tax exclusions for pension benefits. Just as we do not wish to overestimate the economic impacts of pension benefit expenditures by not accounting for tax withholdings,

nor do we wish to underestimate them by assuming that taxes are being withheld when in fact they are not.

Estimating taxes paid by pensioners requires assuming that beneficiaries are taxed by the state of residence, not the state of the pension's origin. For example, a retiree moving from New York to Arizona would pay Arizona income taxes on her pension benefit, not Arizona taxes. If any retirees, for some reason, are still paying income taxes to the state of the pension's origin, and not their current state of residence, our results may be over- or underestimated, depending on the tax codes of the states in question. For example, if a retiree is assumed to be paying taxes in a state with a full pension exclusion but is in fact paying taxes in a state with no exclusion, our output, employment, and value added results will be overestimated, as that retiree has less disposable income to spend than we assume. Should the opposite case occur—where a retiree is assumed to have no tax exclusion but is in fact paying taxes to a state with a full exclusion—our results will be underestimated, because we are assuming less disposable income for that retiree. On an aggregate, net basis, we have no reason to believe there is a bias in either direction.

## IMPLAN Modeling

This study uses IMPLAN, an input-output modeling software, to measure the economic impacts of benefits paid by DB pension plans. IMPLAN was first developed in the 1970s as a part of a USDA Forest Service project to analyze the economic effects of local land management projects such as timber, mining, and recreation activities. Since that time, IMPLAN has been used by industry and government analysts throughout the country to assess economic impacts of highly varied local community development projects; these studies include many recent economic impact studies of pension benefit payments. Because of differences in modeling and the data used, the results of our study may not be comparable with these other analyses. Thus, the reader should avoid drawing conclusions based on comparisons between our results and those of other studies.

IMPLAN is an input-output model that uses a matrix to represent the economy of a region in order to estimate the effect of events occurring in a single industry or institution on all other industries, as well as consumers, government, and foreign suppliers to the economy. IMPLAN uses a Social Accounting Matrix (SAM), which captures all the industry and institution transactions in the local area; subsections of a SAM describe various structures and functions of a local economy. The SAM describes a local economy in terms of the flow of dollars from purchasers to producers within a region, while also accounting for non-industrial transactions such as payment of taxes by businesses and households. This offers a better portrayal of the household income effect portion of local economic events than other models.

Since NIRS' original *Pensionomics* study was published in 2009, IMPLAN has undergone significant modeling changes. Version 2, used in the original study, used an Econometric Regional Purchase Coefficient (RPC) method. The more recent Version 3, utilized in this study, uses a trade flow model. Due to its internal consistency and by accounting for spatial variables like the proximity and size of alternative markets, the trade flow model is presumed to be superior to econometric methods for estimating regional RPCs.[36] Internet sales, for example, are given a lower impedence in the trade flows model than in the econometric RPC model, especially compared to the other retail sectors, meaning that it is more likely that such e-commerce will be imported. Thus, interstate commerce leakages in the trade flows model are likely to be higher than in the previous version. Due to these changes, results of the current study are not directly comparable to those of the older *Pensionomics* study, and the reader should avoid drawing conclusions based on such comparisons.

National and state by state IMPLAN data for 2009 was used, as this corresponded with the Census data on public pension payments, for which 2009 was the most recently available. For this study, each state's aggregated, in-state, disposable pension payments are inputted into IMPLAN as direct payments to households, as IMPLAN estimates household spending patterns by income class. The household income range used is based on the median household income among heads of household age 65 and older for that state, taken from the 2009 American Community Survey of the U.S. Census.[37]

Benefits that are sent out of state are assumed to be spent in the state to which they are sent. Therefore, each state's economic impact includes out of state benefit payments from each of the forty-nine other states. These out of state benefits are calculated, for a single state, based on the same migration

assumptions described above. All forty-nine states' payments are summed together, and tax withholdings are subtracted. These net payments are then added to the IMPLAN model to calculate the aggregate out of state pension benefit impacts for that single state.

Again, one state's "leakage" is another state's inflow, and since our analysis is concerned with measuring the economic impact of state and local pension benefits, regardless of their community or state of origin or destination, we need to account for the economic impacts of pension dollars that flow across state lines. As IMPLAN Version 3 utilizes a trade flow model to estimate the SAM, we are able to account for the economic effects flowing out of one state and into to another by utilizing a Multi-Regional Input-Output Analysis (MRIO). For example, to determine the economic impacts of $1 million in Alabama's pension payments that may flow to the state of Alaska, we set up an MRIO analysis of Alabama's pension payments between Alabama and Alaska. Thus, we are able to recapture some of any single state's economic leakage due to interstate commerce.

## Gross Economic Impacts

This study measures the gross economic impacts of pension benefit expenditures only, rather than the net economic impacts. Pension payments are a form of deferred compensation, meaning that employees and employers contribute to the pension trust over the course of an employee's career as a portion of the employee's total compensation. Had that employee received that compensation in another form—for example, a slight increase in gross pay each month—s/he would have seen higher disposable income, and presumably would have spent a portion of that income in the local economy at that time. Accurately accounting for the net economic impacts of public pensions would require a dynamic model and data that spans several decades. Because of data limitations, this is not possible.

Although one might be tempted to simply deduct from a single year's gross benefit payments the total employee and employer contributions in that year to capture a net effect, such a measure will not be accurate. First, the contributions for any given year for active employees have no bearing on the benefits paid out in that year to retirees. Due to the nature of prefunded pension systems discussed earlier, older, more mature pension systems could likely be construed as having a larger economic impact than younger, less mature systems, simply because the older system will generally pay out more benefits per current worker. Yet this interpretation would be highly inaccurate, since the whole point of prefunding is that current workers do not pay the benefits of retirees, but pay into the system during the course of their career for their own retirement. Due to these limitations and possible misinterpretations, the analysis we present here assesses gross economic impacts, rather than net impacts.

## Tax Revenue

To calculate total tax revenue attributable to state and local pension payments, income taxes paid by beneficiaries on benefit payments are added to taxes paid in all subsequent rounds of spending. For the former, the federal and state taxes are calculated as described above. For the latter, IMPLAN calculates all corporate, personal income, and business taxes that are attributable to each spending round: direct, indirect, and induced expenditures. Total tax revenue is the sum of these two figures, calculated for both in state and out of state benefits.

## Multipliers

Multipliers are ratios that relate the overall economic effect to a single unit of any initial event. An output multiplier, for example, displays the total output generated for every dollar that is initially spent in a local economy. We calculate a pension expenditure multiplier, which describes the impact on total output for each dollar paid out in pension benefits by a state or local plan. For example, a pension expenditure multiplier of 2.2 would mean that for every $1 paid out in a pension benefit, $2.20 of total economic output is supported in the local economy.

Pension expenditure multipliers are calculated by dividing the total output supported by retiree expenditures by total pension payments made in that year. (For the state-level multipliers, this includes pension payments originating within the state as well as outside of the state.)

We also calculate "taxpayer investment factors" at the national and state levels. This measurement is designed to capture a sense of "return on investment" for each dollar

contributed in taxpayer contributions to state and local plans, following the methodology developed by Fountain and Waste.[38] First, we proxy the proportion of benefits paid out in 2009 that were attributable to taxpayer contributions. We do this by calculating (both nationally and for each state), the proportion of total state and local pension plan revenues that are attributable to taxpayer contributions over the period 1993 through 2009. We then multiply this percentage by the benefits paid by state and local pension plans (again at the national or state level) in 2009. This becomes the denominator for our taxpayer contribution factor. The numerator is the total output supported by retiree expenditures in 2009.

Note that caution should be used in interpreting the taxpayer investment factor for some states, due to the way the Census reports taxpayer and employee contributions. Because the Census data reflects the taxable status of contributions only, but not the pre-tax salary reduction cost-sharing methods used in some states (Nevada, for example), employee contributions may be reported as taxpayer contributions. This will tend to overstate the proportion of pension benefits that are attributable to taxpayer contributions and understate the taxpayer investment factors we report.

Alternatively, to the extent that any particular pension fund has not received its full Annual Required Contribution between 1993 and 2009, the proportion of pension fund receipts attributable to the employer contribution may be understated. This will tend to understate the proportion of pension benefits attributable to taxpayer contributions and overstate the taxpayer investment factors we report.

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