

**The Financial Contribution of Oil and Natural Gas Company  
Investments To Major Public Pension Plans in Four States,  
2005 – 2009**

**Robert J. Shapiro and Nam D. Pham**

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# The Financial Contribution of Oil and Natural Gas Company Investments To Major Public Employee Pension Plans in Four States, 2005 – 2009<sup>1</sup>

## Executive Summary

This report examines the financial impact of investments in oil and natural gas companies on the overall performance of the two largest public employee pension funds in each of four states – Michigan, Missouri, Ohio and Pennsylvania.<sup>2</sup> The data show these investments sharply out-performed the funds' other assets. From 2005 to 2009, spanning both vigorous expansion and deep recession, the share of the funds' returns attributable to oil and natural gas investments was 2.5 times to 2.8 times greater than their share of those funds' assets.

### Total Assets, Oil and Natural Gas Assets, and Returns on Those Assets, Two Largest Pension Funds in Four States, 2005 – 2009<sup>3</sup>

State	Total Assets (billions)	Oil and Natural Gas Assets (billions)	Oil and Natural Gas Assets As a Share of Total Assets	Returns from Oil and Gas Assets as a Share of All Returns	Ratio of Oil and Natural Gas Asset Returns to Their Share of Total Assets
MI	\$52.8	\$2.5	4.8%	12.2%	2.5 to 1
MO	\$32.6	\$1.1	3.3%	9.2%	2.8 to 1
OH	\$138.3	\$6.1	4.4%	11.6%	2.6 to 1
PA	\$86.2	\$2.9	3.4%	8.6%	2.5 to 1

- In all four states, the two largest public pension funds account for between 50% and 89% of the total membership and assets of all public employee pension programs in the state. The total membership of these programs ranges between 229,120 in Missouri to 1,378,179 in Ohio.
- The level and extent of these funds' investments in oil and natural gas vary across the four states from \$1.1 billion and 3.3% of the total assets of the two largest plans in Missouri, to \$6.1 billion and 4.4% of the assets of the two largest plans in Ohio.
- The oil and natural gas investments by Michigan's two largest public pension plans accounted for 4.8% of those funds' total assets while contributing 12.2% of those funds' total gains, for a ratio of 2.5 to 1. Similarly, the oil and natural gas investments by Missouri's two largest public pension plans accounted for 3.3% of those funds' total assets while contributing 9.2% of those funds' total gains, for a ratio of 2.8 to 1.
- The oil and natural gas investments by Ohio's two largest public pension plans accounted for 4.4% of those funds' total assets while contributing 11.6% of those funds' total gains, for a ratio of 2.6 to 1. The oil and natural gas investments by Pennsylvania's two largest public pension plans accounted for 3.4% of those funds' total assets while contributing 8.6% of those funds' total gains, for a ratio of 2.5 to 1.

<sup>1</sup> The authors wish to acknowledge research support from the American Petroleum Institute. The analysis and conclusions are solely those of the authors.

<sup>2</sup> We use "oil and gas company holdings" synonymously with "energy sector holdings" in this report, as oil and gas companies comprise 98 percent of the value of the S&P Energy Sector Index and the vast majority of energy sector holdings in the public employee pension funds examined here. The current S&P 500 Energy Sector Index is comprised of 60 percent integrated oil & gas companies; 18 percent oil & gas exploration and production enterprises; 14 percent oil and gas equipment and services firms; 3 percent oil and gas storage and transportation companies; 2 percent oil and gas drilling firms; and 1 percent oil & gas refining & marketing. Coal and consumable fuels account for the remaining 2 percent of the Index.

<sup>3</sup> Comprehensive Annual Financial Reports of different retirement systems. For details of sources, see footnotes for Tables MI-1, MO-1, OH-1, and PA-1.

# **The Financial Contribution of Oil and Natural Gas Company Investments To Major Public Pension Plans in Four States, 2005 – 2009<sup>4</sup>**

**Robert J. Shapiro and Nam D. Pham**

## **I. Introduction and Summary of Results**

This report examines the financial impact of investments in oil and natural gas companies to the overall performance of state public employee pension funds.<sup>5</sup> Many pension funds will face daunting challenges in meeting their future obligations. In this study, we analyze an aspect of a traditional investment approach for meeting this challenge by charting the impact over five years of investments in oil and natural gas companies by the two largest public pension funds in four states. We found that over the period from 2005 to 2009, spanning years of vigorous expansion and deep recession, the share of the funds' returns attributable to oil and natural gas assets was 2.5 times to 2.8 times greater than their share of those funds' assets. This analysis of public employee pension systems is an interim report. In coming months, we will expand it to 17 states and so cover a majority of the nation's state public employee pension members and assets.

The four states examined here are Michigan (MI), Missouri (MO), Ohio (OH), and Pennsylvania (PA). In each case, we analyze the portfolio and performance of the two largest public pension systems in the state, which in all cases are the pension program for public teachers and other public school employees, and the fund for state government employees. In all four states, these two funds account for between 50 percent and 89 percent of the total membership and total assets of all public employee pension programs in the state. The level and extent of these funds' investments in oil and natural gas, however, vary across the four states, from \$1.1 billion and 3.3 percent of the total assets of the two largest plans in Missouri, to \$6.1 billion and 4.4 percent of the assets of the two largest plans in Ohio. (Table 1, below)

**Table 1. Membership, Assets, and Oil and Natural Gas Holdings  
of the Two Largest Pension Funds In Four States, Annual Average, 2005 – 2009<sup>6</sup>**

<b>State</b>	<b>Membership</b>	<b>Total Assets (Billions)</b>	<b>Oil and Natural Gas Assets (Billions)</b>	<b>Oil and Natural Gas Assets as a Share of Total Assets</b>
<b>MI</b>	555,050	\$52.8	\$2.5	4.8%
<b>MO</b>	229,120	\$32.6	\$1.1	3.3%
<b>OH</b>	1,378,179	\$138.3	\$6.1	4.4%
<b>PA</b>	650,556	\$86.2	\$2.9	3.4%

<sup>4</sup> The authors wish to acknowledge research support from the American Petroleum Institute. The analysis and conclusions are solely those of the authors.

<sup>5</sup> We use "oil and gas company holdings" synonymously with "energy sector holdings" in this report, as oil and gas companies comprise 98 percent of the value of the S&P Energy Sector Index and the vast majority of energy sector holdings in the public employee pension funds examined here. The current S&P 500 Energy Sector Index is comprised of 60 percent integrated oil & gas companies; 18 percent oil & gas exploration and production enterprises; 14 percent oil and gas equipment and services firms; 3 percent oil and gas storage and transportation companies; 2 percent oil and gas drilling firms; and 1 percent oil & gas refining & marketing. Coal and consumable fuels account for the remaining 2 percent of the Index.

<sup>6</sup> Comprehensive Annual Financial Reports of different retirement systems. For details of sources, see footnotes for Tables MI-1, MO-1, OH-1, and PA-1.

Our analysis found that the public pension funds examined here achieved returns of 41 percent to 49 percent on their oil and natural gas investments over the five-year period, compared to returns of 10 percent to 17 percent for the same funds' non-oil and natural gas investments. (Table 2, below)

**Table 2. Returns on All Assets and Oil and Natural Gas Assets of the Two Largest Pension Funds in Four States, 2005 – 2009<sup>7</sup>**

State	Return on \$1 Invested in US Oil and Natural Gas Stocks	Return on \$1 Invested in All Other Assets	Returns from Oil and Natural Gas Investments as a Share of All Returns	Ratio of Oil and Natural Gas Assets' Share of All Returns and their Share of All Assets
MI	\$1.49	\$1.17	12.2%	2.5 to 1
MO	\$1.41	\$1.10	9.2%	2.8 to 1
OH	\$1.48	\$1.11	11.6%	2.6 to 1
PA	\$1.48	\$1.15	8.6%	2.5 to 1

Table 2, above, provides a summary measure of the relative performance of the oil and natural gas assets held by these public pension funds from 2005 to 2009, relative to other investments. This measure is the ratio of the oil and natural gas assets' share of all gains, relative to their share of all assets. We found that the share of these funds' gains attributable to their oil and natural gas investments was between 2.5 times and 2.8 times greater than these oil and natural gas investments' share of the funds' total assets. So, for example, the oil and natural gas investments by Michigan's two largest public pension plans accounted for 4.8 percent of those funds' total assets (Table 1, above) while contributing 12.2 percent of those funds' total gains, for a ratio of 2.5 to 1. (Table 2, above)

We also estimate the impact of oil and natural gas investments on the returns of all public employee pension programs in each state, using aggregate data collected by the Census Bureau. This analysis of state-wide public pension systems is not as complete as the prior analysis based on the two largest plans in each state. In particular, the Census Bureau has not issued 2009 data on statewide public pension systems. Since oil and natural gas shares declined in 2009, as did overall markets, the 2005-2008 data provide a less complete picture of the performance of oil and natural gas stocks, compared to other sectors and other classes of investments, over a business cycle.

With this caveat, the analysis of the Census Bureau data reinforces the more detailed examination of the major public pension funds in these states. (Table 3, below) Based on the statewide data, oil and natural gas investments significantly out-performed the rest of the portfolios of the statewide public employee pension systems of these four states, over the years 2005 to 2008.

<sup>7</sup> Comprehensive Annual Financial Report of different retirement systems, and authors' calculations. For details of sources, see Tables MI-2, MO-2, OH-2, PA-2..

**Table 3. Cumulative Returns from All Assets and from Oil and Natural Gas Investments By Statewide Public Employee Pension Plans, Four States, 2005-2008<sup>8</sup>**

State	Cumulative Returns from All Assets (\$ million)	Cumulative Returns on Oil and Natural Gas Investments (\$ million)	Oil and Natural Gas Assets As a Share of All Assets (Average)	Oil and Natural Gas Assets' Share of Returns from All Assets
MI	\$28,446.4	\$3,298.9	5.0%	11.6%
MO	\$17,756.8	\$1,355.9	2.8%	7.6%
OH	\$63,770.1	\$6,052.2	4.6%	9.5%
PA	\$51,837.7	\$3,101.1	3.1%	5.8%

These data show, for example, that the oil and natural gas assets of Michigan state public pension plans generated 11.6 percent of their returns while accounting for an average of 5.0 percent of their assets over the four years, a ratio of 2.3 to 1.0. The ratios for the other three states are 2.7 to 1.0 (MO), 2.1 to 1.0 (OH) and 1.9 to 1.0 (PA). In all cases, investments in oil and natural gas stocks widely outperformed the rest of these states' public pension system investments.

## II. Methodology

This interim report estimates the financial impact of oil and gas company stocks to the returns achieved by the major public pension plans in Michigan, Missouri, Ohio and Pennsylvania over the five year period from 2005 to 2009. A subsequent report will examine 13 additional states. For each state, we selected the two largest state pension funds, covering public school employees and state employees. Across the four states analyzed here, these two public pension plans account for between 50 percent to 89 percent of the total assets and membership of all of the public pension plans in the states. The public pension plans within each state generally follow broadly similar investment strategies. Therefore, we also apply the energy holdings as a share of the total assets and annual returns of the two largest pension plans to the aggregate holdings of all of a state's public pension assets to estimate the financial contribution of oil and gas company stock prices to all public pension funds in that state.

For each state, we collected five years of investment data from the Comprehensive Annual Financial Reports (CAFRs) of the two largest public pension funds, including their total assets, asset allocations across classes of financial instruments, holdings by sector (including energy), and annual returns by financial class and sector. The asset allocations are reported for U.S. equities, international equities, fixed income securities, and other asset classes (cash, short-term instruments, real estate and alternative investments), in dollar amounts and as percentages of total assets. When a fund did not report its investments in the oil and natural gas sector (five of the eight funds in this interim report), we use the energy sector's share in the S&P 500 to estimate the pension fund's holdings of oil and natural gas stocks. For example, energy companies accounted for 9.3 percent of the value of the S&P 500 index in 2005, 9.8 percent in

<sup>8</sup> Comprehensive Annual Financial Report of different retirement systems, and authors' estimates. For details on sources, see Tables MI-4, MO-4, OH-4, and PA-4..

2006, 12.9 percent in 2007, 13.3 percent in 2008, and 11.5 percent in 2009.<sup>9</sup> We also use each fund's reported exposure to the oil and natural gas sector and the S&P 500 Energy Sector as a proxy for oil and gas company holdings and the return of the funds' oil and gas company holdings. The data reported by the funds does not include all individual company holdings, making it impossible to isolate oil and gas companies. However, the S&P 500 Energy Sector is comprised almost entirely of oil and gas companies, with oil and gas companies accounting for 98.1 percent of the current S&P Energy Sector.<sup>10</sup>

To estimate the holdings and returns for all public employee pension plans in a state, we use aggregate data reported by the U.S. Census Bureau on each state, including total assets, asset allocations, memberships, and benefits. Since the Census Bureau does not report oil and natural gas sector holdings by state, we apply the share of total holdings in oil and natural gas stocks for the state's largest pension plan in each year to the state-wide level. If a state's two largest public pension plans do not report their oil and natural gas sector holdings, we apply the share of oil and natural gas stocks in the S&P 500 and the returns of the S&P 500 Energy Sector.

In calculating the contribution of oil and natural gas stocks to each plan's assets and returns, we first estimate the plan's annual capital gains and losses based on its annual returns and assets. Next, we estimate the capital gains and losses of the plan's oil and natural gas sector holdings each year based on its oil and natural gas assets and the annual return of the S&P 500 Energy Sector Index. Finally, we use the fund's total capital gains and losses each year and the capital gains and losses of its oil and natural gas sector holdings to estimate the contribution of oil and natural gas sector companies to the fund's overall returns.

### **III. Michigan**

#### ***The Two Largest Public Pension Plans***

The various public employee retirement plans in Michigan publish annual data on their investment portfolios and performance. We collected those data for the fiscal years 2005-2009 for the State's two largest public employees retirement plans, the Public School Employees' Retirement System (PSERS) and the State Employees' Retirement System (SERS). Over this five-year period, these two plans had assets averaging \$52.8 billion and an average of 555,050 members, including current retirees, current employees, and former or inactive employees. (Table MI-1, below) These two plans held oil and natural gas-sector investments averaging \$2.54 billion or 4.8 percent of their total assets. The two plans represent more than 75 percent of all members and 60 percent of all assets of all Michigan public employee retirement plans.

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<sup>9</sup> The domestic equity benchmark for public pension fund systems is typically based on a blend of several index benchmarks, such as the S&P 500, the Russell 3000, and the Wilshire 5000. Since the returns of financial indices are highly correlated over time, our results are not biased by our reliance on the S&P's index.

<sup>10</sup> The breakdown of the current S&P Energy Index: 60.3 percent integrated oil & gas companies; 17.75 percent oil & gas exploration and production; 14.11 percent oil and gas equipment and services; 2.66 percent oil and gas storage and transportation; 1.96 percent oil and gas drilling; and 1.29 percent oil & gas refining & marketing. Coal and consumable fuels account for 1.92 percent of the Index.

**Table MI-1. Michigan's Two Largest Public Employee Retirement Plans:  
Members, Total Assets and Oil and Natural Gas Assets, Annual Average, 2005-2009<sup>11</sup>**

	<b>Total Members</b>	<b>Total Assets (\$ billions)</b>	<b>Oil and Natural Gas Assets (\$ billions)</b>	<b>Oil and Natural Gas Assets as a Share of All Assets</b>
<b>Total</b>	<b>555,050</b>	<b>\$52.831</b>	<b>\$2.542</b>	<b>4.8%</b>
<b>PSERS</b>	470,328	\$42.413	\$2.041	4.8%
<b>SERS</b>	84,722	\$10.408	\$0.501	4.8%

The cumulative rate of return on the assets of these two large plans was about 23 percent for the five years, 2005 to 2009. (Table MI-2, below) By contrast, the S&P 500 Energy Sector produced a 49 percent return over the same period. The two plans, therefore, generated total gains of nearly \$15 billion over this period, including \$1.8 billion in gains from their investments in oil and natural gas stocks. As a result, oil and natural gas investments which represented 4.8 percent of the two plans' total assets contributed 12.15 percent of the two plans' total gains.

**Table MI-2. Michigan's Two Largest Public Employee Retirement Plans:  
Rates of Return and Gains, Overall and from Oil and Natural Gas Investments, 2005-2009<sup>12</sup>**

	<b>Return on \$1 invested in Plans</b>	<b>Return on \$1 invested in Oil and Natural Gas Stocks</b>	<b>Return on \$1 invested in Non-Oil and Natural Gas Investments</b>	<b>Total Gains by Plans (million)</b>	<b>Gains from Oil and Natural Gas Investments (million)</b>	<b>Gain from Oil and Natural Gas as Share of All Gains</b>
<b>Total</b>	<b>\$1.23</b>	<b>\$1.49</b>	<b>\$1.17</b>	<b>\$14,983.8</b>	<b>\$1,819.9</b>	<b>12.15%</b>
<b>PSERS</b>	\$1.23	\$1.49	\$1.17	\$12,034.9	\$1,465.7	12.2%
<b>SERS</b>	\$1.22	\$1.49	\$1.17	\$2,948.9	\$354.2	12.0%

### *All Michigan Public Employee Retirement Programs*

To estimate the impact of oil and natural gas stocks on the returns on all Michigan public employee retirement programs, we use annual Census Bureau data on public employee retirement systems by state, including members, benefits, and the value and distribution of their assets. The available data cover 2005 to 2008, as the 2009 data have not yet been published. Since the returns on all investments and on oil and natural gas investments in particular fell sharply in 2009, the four years of aggregate data by state cannot be strictly compared to the five years of data on the large plans. The available data show, for example, that all public employee retirement plans in Michigan over this four-year period covered about 287,000 retirees and beneficiaries, 422,000 active employees, and nearly 33,000 inactive employees. The monthly benefit of the retirees under these public employee pension plans averaged \$1,521. The Census Bureau data also show the allocation of total assets by asset-class for all public employee retirement plans in Michigan for the years 2005-2008. (Table MI-3, below)

<sup>11</sup> Comprehensive Annual Financial Report of Public Schools Employees Retirement Systems and State Employees Retirement System and authors' estimates.

<sup>12</sup> *Ibid.*

**Table MI-3. All Michigan Public Employee Retirement Plans:  
Asset Allocations, 2005-2008<sup>13</sup>**

Year	Total	US Stocks: All Sectors	US Oil and Natural Gas Stocks	International Equities	Fixed Income	Other Assets
<i>As percentage of total assets</i>						
2005	100.0%	45.3%	4.8%	9.3%	18.8%	26.6%
2006	100.0%	41.9%	4.6%	10.0%	17.0%	31.1%
2007	100.0%	40.1%	5.3%	9.3%	16.2%	34.4%
2008	100.0%	39.4%	5.1%	6.3%	18.0%	36.3%
<i>In millions of US dollars</i>						
2005	\$74,130.0	\$33,580.9	\$3,558.2	\$6,894.1	\$13,936.4	\$19,718.6
2006	\$89,201.6	\$37,375.5	\$4,103.3	\$8,920.2	\$15,164.3	\$27,741.7
2007	\$105,084.2	\$42,138.8	\$5,569.5	\$9,772.8	\$17,023.6	\$36,149.0
2008	\$85,646.5	\$33,744.7	\$4,368.0	\$5,395.7	\$15,416.4	\$31,089.7

With these data, we find that \$1.00 invested in the Michigan public employees' retirement system in October 2004 grew to \$1.31 in September 2008 (fiscal year ends September 30). Over this period, \$1.00 invested in the S&P Energy Sector grew to \$1.75. If the system had not held oil and natural gas stocks, \$1.00 invested in 2005 would have grown to \$1.22 in 2008.

Annual returns fluctuated widely over the four years, ranging from 17.2 percent to negative 12.3 percent for all assets and from 44.2 percent to negative 16.7 percent for oil and natural gas assets. (Table MI-4, below) Although these years are less representative without 2009, we estimate that oil and natural gas investments contributed \$3.3 billion of the system's net \$28.5 billion in returns over the period. Thus, oil and natural gas investments representing about 5 percent of total system holdings contributed 11.6 percent of their gains over this period.

**Table MI-4. All Michigan Public Employee Retirement Plans,  
Returns and Gains for All Assets and for Oil and Natural Gas Investments, 2005-2008<sup>14</sup>**

Year	Annual Return on All Assets	Annual Return on Oil and Natural Gas Stocks	Return on \$1 of All Assets Invested in 2005	Return on \$1 in Oil & Natural Gas Assets Invested in 2005	Return on \$1 of Non- Oil and Natural Gas Assets But Invested in 2005	Capital Gains/ Losses for All Assets (million)	Capital Gains/ Losses of Oil and Natural Gas Investments (million)
10/2004			\$1.00	\$1.00	\$1.00		
2005	12.8%	44.2%	\$1.13	\$1.44	\$1.06	\$9,488.6	\$1,571.0
2006	12.8%	2.4%	\$1.27	\$1.48	\$1.20	\$11,417.8	\$100.1
2007	17.2%	42.3%	\$1.49	\$2.10	\$1.38	\$18,074.5	\$2,356.4
2008	-12.3%	-16.7%	\$1.31	\$1.75	\$1.22	(\$10,534.5)	(\$728.6)
<b>Total</b>						<b>\$28,446.4</b>	<b>\$3,298.9</b>

<sup>13</sup> U.S. Census' State & Local Government Employee Retirement Systems; Comprehensive Annual Financial Report; and authors' estimates.

<sup>14</sup> *Ibid.*



## Background - Michigan

### Michigan Public School Employees' Retirement System

The Michigan Public School Employees' Retirement System provides pension benefits for all public school employees in the State. The System's membership consists of retirees and beneficiaries; current employees, both vested and non-vested; and inactive employees entitled to benefits at some time. Membership averaged 470,300 over 2005-2009, and the monthly pension payments paid to its qualified retirees and beneficiaries averaged \$1,538. (Table MI-5 below)

**Table MI-5. Michigan Public School Employees' Retirement System, Membership Classes and Monthly Benefit Payments, 2005-2009<sup>15</sup>**

Year	Retirees and Beneficiaries	Active Employees	Inactive Employees	Total	Average Monthly Benefit Payments
2005	151,706	316,151	16,806	484,663	\$1,453
2006	157,163	305,445	15,739	478,347	\$1,500
2007	162,844	295,984	14,999	473,827	\$1,542
2008	167,265	278,642	14,312	460,219	\$1,580
2009	171,922	268,208	14,454	454,584	\$1,617
<b>Average</b>	<b>162,180</b>	<b>292,886</b>	<b>15,262</b>	<b>470,328</b>	<b>\$1,538</b>

The public school pension fund's investments are well diversified. Domestic equities accounted for the largest share of assets averaging 44.5 percent of total holdings. Investments in energy companies, more than 98 percent in oil and gas companies, are estimated based on the System's asset allocation and benchmarks. Equity investments in oil and natural gas companies accounted for an average of 4.8 percent of total assets over this period. (Table MI-6)

**Table MI-6. Michigan Public School Employees' Retirement System, Asset Allocation, 2005-2009<sup>16</sup>**

Year	Total	US Stocks: All Sectors	US Oil and Natural Gas Stocks	International Equities	Fixed Income	Other Assets
<i>As percentage of total assets</i>						
2005	100.0%	48.5%	4.8%	12.3%	16.4%	22.8%
2006	100.0%	48.4%	4.6%	12.2%	16.3%	23.1%
2007	100.0%	47.0%	5.3%	11.3%	16.4%	25.3%
2008	100.0%	42.1%	5.1%	8.9%	17.2%	31.8%
2009	100.0%	36.5%	4.1%	12.6%	18.8%	32.1%
<i>In millions of US dollars</i>						
2005	\$42,205.9	\$20,469.9	\$2,025.3	\$5,191.3	\$6,921.8	\$9,623.0
2006	\$43,145.6	\$20,882.5	\$1,984.7	\$5,263.8	\$7,032.7	\$9,966.6
2007	\$48,938.4	\$23,001.0	\$2,593.7	\$5,530.0	\$8,025.9	\$12,381.4
2008	\$41,339.6	\$17,404.0	\$2,108.3	\$3,679.2	\$7,110.4	\$13,146.0
2009	\$36,437.5	\$13,299.7	\$1,493.9	\$4,591.1	\$6,850.3	\$11,696.4

<sup>15</sup> Michigan Public School Employees Retirement System, Comprehensive Annual Financial Report.

<sup>16</sup> *Ibid.*, S&P's; and authors' estimates.

Using the public school pension system's reported annual returns, we calculate that \$1.00 invested in the System in October 2004 grew to \$1.23 in September 2009 (the fiscal year ends on September 30). During this period, \$1.00 invested in the S&P Energy Sector grew to \$1.49. If the System had not invested in oil and natural gas stocks, \$1.00 invested in 2004 would have grown to \$1.17 in 2009.

We next estimate the annual capital gains and losses of the public school pension system's total assets and the portion invested in oil and natural gas stocks. Over this period, the System's net gains totaled more than \$12 billion, including nearly \$1.5 billion in net gains from investments in the oil and natural gas sector. The System's oil and natural gas investments, which accounted for 4.8 percent of its total assets, provided 12.2 percent of its total gains. (Table MI-7, below)

**Table MI-7. Michigan Public School Employees' Retirement System, Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2009<sup>17</sup>**

Year	Annual Return on All Assets	Annual Return on Oil and Natural Gas Stocks	Return on \$1 of All Assets Invested in 2005	Return on \$1 of Oil and Natural Gas Assets Invested in 2005	Return on \$1 of Non-Oil and Natural Gas Assets Invested in 2005	Capital Gains/ Losses from All Assets (million)	Capital Gains/ Losses From Oil and Natural Gas Investments (million)
<b>10/2004</b>			\$1.00	\$1.00	\$1.00		
<b>2005</b>	12.8%	44.2%	\$1.13	\$1.44	\$1.06	\$5,402.4	\$894.4
<b>2006</b>	12.8%	2.4%	\$1.27	\$1.48	\$1.20	\$5,522.6	\$48.4
<b>2007</b>	17.2%	42.3%	\$1.49	\$2.10	\$1.38	\$8,417.4	\$1,097.4
<b>2008</b>	-12.3%	-16.7%	\$1.31	\$1.75	\$1.22	\$(5,084.8)	\$(351.7)
<b>2009</b>	-6.1%	-14.9%	\$1.23	\$1.49	\$1.17	\$(2,222.7)	\$(222.9)
<b>Total</b>						<b>\$12,034.9</b>	<b>\$1,465.7</b>

#### *Michigan State Employees' Retirement System*

The Michigan State Employees' Retirement System provides retirement, survivor and disability benefits to the state government employees. The System's membership includes retirees and beneficiaries currently receiving benefits, current employees including those vested and non-vested, and inactive employees entitled to benefits but not yet receiving them. The monthly pension payments to qualified retirees and beneficiaries averaged \$1,427 per-month over this period. (Table MI-8)

<sup>17</sup> Michigan Public School Employees Retirement System, Comprehensive Annual Financial Report; S&P's; and authors' estimates.

**Table MI-8. Michigan State Employees' Retirement System,  
Membership Classes and Monthly Benefit Payments, 2005-2009<sup>18</sup>**

Year	Retirees and Beneficiaries	Active Employees	Inactive Employees	Total	Average Monthly Benefit Payments
2005	45,801	33,770	7,200	86,771	\$1,360
2006	45,980	32,575	7,217	85,772	\$1,394
2007	46,886	30,864	6,663	84,413	\$1,425
2008	48,078	28,568	6,912	83,558	\$1,460
2009	49,029	27,455	6,613	83,097	\$1,497
Average	47,155	30,646	6,921	84,722	\$1,427

The state employees' pension system's investments are well diversified across and within asset classes. Domestic equities accounted for the largest share of assets, averaging 44.6 percent of all assets. Investments in the energy sector, more than 98 percent in oil and gas companies, are calculated based on the System's asset allocation and benchmarks. Equity investments in oil and natural gas companies accounted for between 4.1 percent and 5.3 percent of the System's total assets over this period. (Table MI-9, below)

**Table MI-9. Michigan State Employees' Retirement System,  
Asset Allocation, 2005-2009<sup>19</sup>**

Year	Total	US Stocks: All Sectors	US Oil and Natural Gas stocks	International Equities	Fixed Income	Other Assets
<i>As percentage of total assets</i>						
2005	100.0%	48.9%	4.8%	11.8%	16.0%	23.3%
2006	100.0%	48.5%	4.6%	12.3%	16.3%	22.9%
2007	100.0%	47.3%	5.3%	11.5%	16.6%	24.6%
2008	100.0%	41.9%	5.1%	9.0%	16.7%	32.4%
2009	100.0%	36.6%	4.1%	12.9%	18.4%	32.1%
<i>In millions of US dollars</i>						
2005	\$10,058.9	\$4,918.8	\$482.8	\$1,187.0	\$1,609.4	\$2,343.7
2006	\$10,835.9	\$5,255.4	\$498.5	\$1,332.8	\$1,766.3	\$2,481.4
2007	\$12,041.2	\$5,695.5	\$638.2	\$1,384.7	\$1,998.8	\$2,962.1
2008	\$10,183.3	\$4,266.8	\$519.3	\$916.5	\$1,700.6	\$3,299.4
2009	\$8,920.2	\$3,264.8	\$365.7	\$1,150.7	\$1,641.3	\$2,863.4

Using the System's reported annual returns, we calculate that \$1.00 invested in the System in October 2004 grew to \$1.23 in September 2009 (the fiscal year ends on September 30). During this period, \$1.00 invested in the S&P Energy Sector grew to \$1.49. If the System had not invested in oil and natural gas stocks, \$1.00 invested in 2005 would have grown to \$1.17 in 2009. We next estimate the annual capital gains and losses of the System's assets and the portion invested in oil and natural gas stocks. Over this period, the System's net gains totaled nearly \$3 billion, including \$354 million in net gains from investments in the oil and natural gas

<sup>18</sup> Michigan State Employees Retirement System, Comprehensive Annual Financial Report.

<sup>19</sup> *Ibid.*, and S&P's; and authors' estimates.

sector. The oil and natural gas investments, which accounted for about 4.8 percent of the System's total assets provided 12.0 percent of the System's total gains. (Table MI-10)

**Table MI-10. Michigan State Employees' Retirement System,  
Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2009<sup>20</sup>**

Year	Annual Return on All Assets	Annual Return on Oil and Natural Gas Stocks	Return on \$1 of All Assets Invested in 2005	Return on \$1 in Oil and Natural Gas Assets Invested in 2005	Return on \$1 of Non-Oil and Natural Gas Assets Invested in 2005	Capital Gains/Losses from All Assets (million)	Capital Gains/Losses from Oil and Natural Gas Investments (million)
<b>10/2004</b>			\$1.00	\$1.00	\$1.00		
<b>2005</b>	12.8%	44.2%	\$1.13	\$1.44	\$1.06	\$1,287.5	\$213.2
<b>2006</b>	12.8%	2.4%	\$1.27	\$1.48	\$1.20	\$1,387.0	\$12.2
<b>2007</b>	17.2%	42.3%	\$1.49	\$2.10	\$1.38	\$2,071.1	\$270.0
<b>2008</b>	-12.3%	-16.7%	\$1.31	\$1.75	\$1.22	(\$1,252.5)	(\$86.6)
<b>2009</b>	-6.1%	-14.9%	\$1.23	\$1.49	\$1.17	(\$544.1)	(\$54.6)
<b>Total</b>						<b>\$2,948.9</b>	<b>\$354.2</b>

#### IV. Missouri

##### *The Two Largest Public Pension Plans*

The retirement plans for public employees in Missouri (MO) publish annual data on their investment portfolios and performance. We collected data for FY 2005-2009 for the State's two largest public employees' pension plans, the Public School Retirement System of Missouri (PSRS) and the Missouri State Employees' Retirement System (MOSERS). Over this period, these plans had assets averaging \$32.6 billion and an average of 230,000 members, including retirees, current employees and former employees. (Table MO-1, below) The plans held oil and natural gas investments averaging \$1.1 billion, 3.3 percent of total assets. The two plans represent 52 percent of all members and 66 percent of all assets of Missouri public employee retirement plans.

**Table MO-1. Missouri's Two Largest Public Employee Retirement Plans:  
Total Assets and Oil and Natural Gas Assets, 2005-2009<sup>21</sup>**

	Total Members	Total Assets (\$ billions)	Oil and Natural Gas Assets (\$ billions)	Oil and Natural Gas Assets as Share of All Assets
<b>Total or Average</b>	<b>229,120</b>	<b>\$32.564</b>	<b>\$1.089</b>	<b>3.3%</b>
<b>PSRS</b>	128,445	\$25.388	\$0.856	3.4%
<b>MOSERS</b>	100,675	\$7.176	\$0.233	3.2%

<sup>20</sup> Michigan State Employees Retirement System, Comprehensive Annual Financial Report; S&P's; and authors' estimates.

<sup>21</sup> Comprehensive Annual Financial Report; S&P's; and authors' estimates.

The overall rate of return on the assets of these two large plans was about 16 percent over the five years, 2005-2009. (Table MO-2, below) In contrast, S&P 500 Energy Sector produced a 41 percent return over the same period. The two plans, therefore, generated total gains of more than \$6 billion over this period, including nearly \$600 million in gains from their investments in oil and natural gas stocks. As a result, oil and natural gas investments representing 3.3 percent of the two plans' total assets contributed 9.2 percent of their total gains.

**Table MO-2. Missouri's Two Largest Public Employee Retirement Plans:  
Rates of Return and Gains Overall and from Oil and Natural Gas Investments, 2005-2009<sup>22</sup>**

	Return on \$1 invested in Plans	Return on \$1 Invested in Oil and Natural Gas Stocks	Return on \$1 of Non- Oil and Natural Gas Investments	Total Gains by Plans (\$ million)	Gains from Oil and Natural Gas Investments (\$ million)	Gain from Oil and Natural Gas as Share of All Gains
<b>Total</b>	<b>\$1.16</b>	<b>\$1.41</b>	<b>\$1.10</b>	<b>\$6,180.4</b>	<b>\$568.5</b>	<b>9.2%</b>
<b>PSRS</b>	\$1.08	\$1.41	\$1.03	\$4,094.8	\$417.2	10.2%
<b>MOSERS</b>	\$1.23	\$1.41	\$1.18	\$2,085.6	\$151.3	7.3%

### *All Missouri Public Employee Retirement Programs*

The Census Bureau issues annual aggregate data on public employee retirement systems by state, including the value and distribution of their assets. The data covering only 2005 – 2008 are currently available. Since the returns on all investments and oil and natural gas investments in particular fell sharply in 2009, the aggregate data by state cannot be strictly compared to the data on the large plans covering the additional year. The available data for 2005-2008 show, for example, that public employee retirement plans in Missouri covered some 133,000 retirees and beneficiaries, 273,000 active employees, and nearly 52,000 inactive employees. The monthly benefit of all retirees under these plans averaged \$1,655. The Census Bureau data also provide the allocation of total assets by asset-class, 2005-2008. (Table MO-3, below)

**Table MO-3. All Missouri Public Employee Retirement Plans:  
Asset Allocations, 2005-2008<sup>23</sup>**

Year	Total	U.S. Stocks: All Sectors	US Oil and Natural Gas Stocks	International Equities	Fixed Income	Other Assets
<i>As percentage of total assets</i>						
<b>2005</b>	100.0%	34.2%	2.7%	15.8%	28.6%	21.4%
<b>2006</b>	100.0%	31.5%	2.8%	16.8%	32.3%	19.5%
<b>2007</b>	100.0%	33.0%	2.6%	20.6%	26.8%	19.6%
<b>2008</b>	100.0%	29.2%	3.2%	18.1%	23.9%	28.9%
<i>In millions of US dollars</i>						
<b>2005</b>	\$49,739.0	\$17,009.9	\$1,360.8	\$7,843.4	\$14,226.2	\$10,659.4
<b>2006</b>	\$57,538.3	\$18,126.2	\$1,631.4	\$9,641.4	\$18,564.9	\$11,205.8

<sup>22</sup> Comprehensive Annual Financial Report; S&P's; and authors' estimates.

<sup>23</sup> U.S. Census' State & Local Government Employee Retirement Systems; Comprehensive Annual Financial Report; S&P's; and authors' estimates.

<b>2007</b>	\$60,235.4	\$19,905.3	\$1,592.4	\$12,411.1	\$16,117.4	\$11,801.5
<b>2008</b>	\$53,412.7	\$15,572.1	\$1,712.9	\$9,647.2	\$12,773.8	\$15,419.6

We find that \$1.00 invested in Missouri public employees' retirement plans in July 2004 grew to \$1.33 in June 2008 (the fiscal year ends on June 30). During this period, \$1.00 invested in the S&P Energy Sector grew to \$2.48. If the Missouri plans had not invested in oil and natural gas stocks, \$1.00 invested in 2005 would have grown to \$1.25 in 2008. However, annual returns over these four years fluctuated widely, from 16.6 percent to negative 4.6 percent for all assets, and from 36.5 percent to 20.3 percent for oil and natural gas investments. (Table MO-4, below) Although these years are less representative without 2009 data, we estimate that oil and natural gas assets contributed \$1.6 billion of the system's total \$17.8 billion in returns over this period: Oil and natural gas investments representing 2.9 percent of total system holdings generated 8.9 percent of the gains over this period.

**Table MO-4. All Missouri Public Employee Retirement Plans,  
Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2008<sup>24</sup>**

<b>Year</b>	<b>Annual Return on All Assets</b>	<b>Annual Return on Oil and Natural Gas Stocks</b>	<b>Return on \$1 of All Assets Invested in 2005</b>	<b>Return on \$1 in Oil and Natural Gas Assets Invested in 2005</b>	<b>Return on \$1 of Non-Oil and Natural Gas Assets Invested in 2005</b>	<b>Capital Gains/Losses from All Assets (million)</b>	<b>Capital Gains/Losses from Oil and Natural Gas Investments (million)</b>
<b>7/2004</b>			\$1.00	\$1.00	\$1.00		
<b>2005</b>	9.2%	36.5%	\$1.09	\$1.37	\$1.05	\$4,576.0	\$496.7
<b>2006</b>	9.8%	20.3%	\$1.20	\$1.64	\$1.15	\$5,638.8	\$330.5
<b>2007</b>	16.6%	24.5%	\$1.40	\$2.04	\$1.34	\$9,999.1	\$390.0
<b>2008</b>	-4.6%	21.4%	\$1.33	\$2.48	\$1.25	\$(2,457.0)	\$366.4
<b>Total</b>						<b>\$17,756.8</b>	<b>\$1,583.6</b>

### ***Background - Missouri***

#### ***Public School Retirement System of Missouri (PSRS)***

The Public School Retirement System of Missouri provides pension benefits covering all public school employees in the State. The System's membership includes retirees and beneficiaries receiving benefits, current employees including those vested and non-vested, and inactive employees entitled to benefits but not yet receiving them. (Table MO-5, below)

<sup>24</sup> U.S. Census' State & Local Government Employee Retirement Systems; Comprehensive Annual Financial Report; S&P's; and authors' estimates.

**Table MO-5. Public School Retirement System of Missouri,  
Membership Classes and Monthly Benefit Payments, 2005-2009<sup>25</sup>**

Year	Retirees and Beneficiaries	Active Employees	Inactive Employees	Total	Average Monthly Benefit Payments
2005	36,321	73,850	11,692	121,863	n/a
2006	38,110	75,539	11,753	125,402	n/a
2007	39,828	77,121	11,607	128,556	n/a
2008	41,738	78,436	11,580	131,754	n/a
2009	43,746	79,335	11,570	134,651	n/a
Average	39,949	76,856	11,640	128,445	n/a

The System's investments are well diversified. U.S. equities accounted for the largest share of assets. Investments in the oil and natural gas sector are estimated based on the System's asset allocation and benchmarks. Those oil and natural gas investments accounted for between 3.0 percent and 3.8 percent of the System's total assets over this period. (Table MO-6)

**Table MO-6. Public School Retirement System of Missouri,  
Asset Allocation, 2005-2009<sup>26</sup>**

Year	Total	US Stocks: All Sectors	US Oil and Natural Gas Stocks	International Equities	Fixed Income	Other Assets
<i>As percentage of total assets</i>						
2005	100.0%	39.7%	3.2%	17.6%	30.6%	12.1%
2006	100.0%	38.5%	3.5%	20.4%	27.9%	13.2%
2007	100.0%	36.9%	3.0%	21.6%	23.7%	17.8%
2008	100.0%	34.2%	3.8%	19.5%	20.9%	25.4%
2009	100.0%	32.3%	3.6%	17.8%	27.0%	22.9%
<i>In millions of US dollars</i>						
2005	\$23,594.2	\$9,366.9	\$749.4	\$4,152.6	\$7,219.8	\$2,854.9
2006	\$25,458.9	\$9,801.7	\$882.2	\$5,193.6	\$7,103.0	\$3,360.6
2007	\$29,116.9	\$10,744.1	\$859.5	\$6,289.2	\$6,900.7	\$5,182.8
2008	\$27,268.4	\$9,325.8	\$1,025.8	\$5,317.3	\$5,699.1	\$6,926.2
2009	\$21,501.8	\$6,945.1	\$764.0	\$3,827.3	\$5,805.5	\$4,923.9

Using the Missouri Public School Retirement System's reported returns, we find that \$1.00 invested in July 2004 grew to \$1.08 in June 2009 (the fiscal year ends on June 30). Over this period, \$1.00 invested in the S&P Energy Sector grew to \$1.41. If the System had not invested in oil and natural gas stocks, \$1.00 invested in 2004 would have grown to \$1.03 in 2009. (Table MO-7, below) We next estimate the capital gains and losses from this portfolio: The System's net gains totaled nearly \$4.1 billion, including \$553.5 million from oil and natural gas investments. These oil and natural gas investments, accounting for 3.4 percent of total assets, provided 13.5 percent of all gains.

<sup>25</sup> Public School Retirement System of Missouri.

<sup>26</sup> Public School Retirement System of Missouri, Comprehensive Annual Financial Report; S&P's; and authors' estimates.



**Table MO-7. Public School Retirement System of Missouri,  
Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2009<sup>27</sup>**

Year	Annual Return on All Assets	Annual Return on Oil and Natural Gas Stocks	Return on \$1 of All Assets Invested in 2005	Return on \$1 in Oil and Natural Gas Assets Invested in 2005	Return on \$1 of Non-Oil and Natural Gas Assets Invested in 2005	Capital Gains/Losses for All Assets (million)	Capital Gains/Losses of Oil and Natural Gas Investments (million)
<b>7/2004</b>			\$1.00	\$1.00	\$1.00		
<b>2005</b>	9.2%	36.5%	\$1.09	\$1.37	\$1.05	\$2,170.7	\$273.5
<b>2006</b>	9.8%	20.3%	\$1.20	\$1.64	\$1.14	\$2,495.0	\$178.7
<b>2007</b>	16.6%	24.5%	\$1.40	\$2.04	\$1.34	\$4,833.4	\$210.5
<b>2008</b>	-4.6%	8.1%	\$1.33	\$2.48	\$1.24	(\$1,254.3)	\$83.1
<b>2009</b>	-19.3%	-43.0%	\$1.08	\$1.41	\$1.03	(\$4,149.8)	(\$328.7)
<b>Total</b>						<b>\$4,098.8</b>	<b>\$553.5</b>

*Missouri State Employees' Retirement System*

The Missouri State Employees' Retirement System provides retirement, survivor and disability benefits retired employees of the state government. The System's membership, averaging almost 101,000 persons over this period, includes retirees and beneficiaries currently receiving benefits, current employees including those vested and non-vested, and inactive employees entitled to benefits but not yet receiving them. The pension payments to qualified retirees and beneficiaries averaged \$940 per-month over this period. (Table MO-8)

**Table MO-8. Missouri State Employees' Retirement System,  
Membership Classes and Monthly Benefit Payments, 2005-2009<sup>28</sup>**

Year	Retirees and Beneficiaries	Active Employees	Inactive Employees	Total	Average Monthly Benefit Payments
<b>2005</b>	26,117	56,336	14,789	97,242	\$941
<b>2006</b>	27,450	54,887	15,829	98,166	\$914
<b>2007</b>	29,129	54,763	16,578	100,470	\$945
<b>2008</b>	30,572	54,943	17,123	102,638	\$926
<b>2009</b>	32,100	55,454	17,304	104,858	\$973
<b>Average</b>	<b>29,074</b>	<b>55,277</b>	<b>16,325</b>	<b>100,675</b>	<b>\$940</b>

The System's investments are well diversified across and within asset classes. Domestic equities and fixed-income instruments were the two largest classes of investment assets. Investments in the energy sector, more than 98 percent in oil and gas companies, were calculated

<sup>27</sup> Public School Retirement System of Missouri, Comprehensive Annual Financial Report; S&P's; and authors' estimates.

<sup>28</sup> Missouri State Employees' Retirement System, Comprehensive Annual Financial Report.



based on the System's asset allocation and benchmarks. Equity investments in oil and natural gas companies accounted for an average of 3.2 percent of the System's total assets over this period. (Table MO-9, below)

**Table MO-9. Missouri State Employees' Retirement System,  
Asset Allocation, 2005-2009<sup>29</sup>**

Year	Total	US Stocks: All Sectors	US Oil and Natural Gas Stocks	International Equities	Fixed Income	Other Assets
<i>As percentage of total assets</i>						
2005	100.0%	28.7%	2.7%	21.4%	29.4%	20.5%
2006	100.0%	28.5%	2.8%	23.1%	28.9%	19.5%
2007	100.0%	27.7%	3.6%	23.9%	28.1%	20.3%
2008	100.0%	28.3%	3.8%	15.9%	30.9%	24.9%
2009	100.0%	28.3%	3.3%	19.2%	29.4%	23.1%
<i>In millions of US dollars</i>						
2005	\$6,475.6	\$1,855.9	\$172.6	\$1,386.4	\$1,903.3	\$1,330.1
2006	\$7,037.9	\$2,005.8	\$196.6	\$1,625.8	\$2,034.0	\$1,372.4
2007	\$8,123.3	\$2,250.1	\$290.3	\$1,941.5	\$2,282.6	\$1,649.0
2008	\$8,020.0	\$2,269.7	\$301.9	\$1,275.2	\$2,478.2	\$1,997.0
2009	\$6,225.0	\$1,761.7	\$202.6	\$1,195.2	\$1,830.2	\$1,438.0

Using the System's reported annual returns, we calculate that \$1.00 invested in the Missouri State Employees' Retirement System in July 2004 grew to \$1.23 in June 2009 (the fiscal year ends on June 30). During this period, \$1.00 invested in the S&P Energy Sector grew to \$1.41. If the System had not invested in oil and natural gas stocks, \$1.00 invested in 2004 would have grown to \$1.18 in 2009.

We next estimate the annual capital gains and losses from the System's total assets and from the portion invested in oil and natural gas stocks. Over this period, the System's net gains totaled nearly \$2.1 billion, including nearly \$151 million in net gains from investments in the oil and natural gas sector. The oil and natural gas investments, which accounted for 3.2 percent of the System's total assets, provided 7.3 percent of its total gains. (Table MO-10, below)

<sup>29</sup> Missouri State Employees' Retirement System, Comprehensive Annual Financial Report; S&P's; and authors' estimates.

**Table MO-10. Missouri State Employees' Retirement System,  
Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2009<sup>30</sup>**

Year	Annual Return on All Assets	Annual Return on Oil and Natural Gas Stocks	Return on \$1 of All Assets Invested in 2005	Return on \$1 of Oil and Natural Gas Assets Invested in 2005	Return on \$1 of Non-Oil and Natural Gas Assets Invested in 2005	Capital Gains/Losses from All Assets (million)	Capital Gains/Losses from Oil and Natural Gas Investments (million)
7/2004			\$1.00	\$1.00	\$1.00		
2005	12.6%	36.5%	\$1.13	\$1.37	\$1.09	\$817.9	\$63.0
2006	11.5%	20.3%	\$1.26	\$1.64	\$1.21	\$809.4	\$39.8
2007	18.7%	24.5%	\$1.49	\$2.04	\$1.42	\$1,519.1	\$71.1
2008	1.6%	8.1%	\$1.51	\$2.48	\$1.42	\$128.3	\$64.6
2009	-19.1%	-43.0%	\$1.23	\$1.41	\$1.18	(\$1,189.0)	(\$87.2)
<b>Total</b>						<b>\$2,085.6</b>	<b>\$151.3</b>

## V. Ohio

### *The Two Largest Public Pension Plans*

The various retirement plans for public employees in Ohio (OH) publish annual data on their investment portfolios and performance. We collected those data for the two largest Ohio public employees' retirement plans, the State Teachers Retirement System of Ohio (STRS) and the Ohio Public Employees Retirement System (OPERS) for the five years 2005-2009.<sup>31</sup> Over this period, the two plans had combined assets of some \$138 billion and an average of nearly 1.4 million members, including retirees, current employees, and former or inactive employees. (Table OH-1, below) The two plans held investments of \$6.1 billion in the oil and natural gas sector, or 4.4 percent of their total assets. The two plans represent more than 89 percent of all members and 80 percent of all assets of all Ohio public employee retirement plans.

**Table OH-1. Ohio's Two Largest Public Employee Retirement Plans:  
Total Assets and Oil and Natural Gas Assets, Annual Average, 2005-2009<sup>32</sup>**

	Total Members	Total Assets (\$ billions)	Oil and Natural Gas Assets (\$ billions)	Oil and Natural Gas Assets as Share of All Assets
<b>Total or Average</b>	<b>1,378,179</b>	<b>\$138.3</b>	<b>\$6.1</b>	<b>4.4%</b>
<b>STRS</b>	469,382	\$66.8	\$2.8	4.2%
<b>OPERS</b>	908,797	\$71.5	\$3.3	4.6%

<sup>30</sup>*Ibid.*

<sup>31</sup> The two plans use different fiscal years; so, we set aside the difference to calculate their memberships and assets.

<sup>32</sup> Comprehensive Annual Financial Report; S&P's; and authors' estimates.

The rate of return on all of the assets of these two large plans averaged 18 percent for the five years 2005 - 2009. (Table OH-2, below) By contrast, the S&P 500 Energy Sector produced around 48 percent return over the same period.<sup>33</sup> The two plans, therefore, generated total gains of nearly \$41 billion over this period, including more than \$4.6 billion in gains from their investments in oil and natural gas stocks. As a result, oil and natural gas investments representing 4.4 percent of the two plans' total assets contributed 11.6 percent of the two plans' gains.

**Table OH-2. Ohio's Two Largest Public Employee Retirement Plans:  
Rates of Return and Gains Overall and from Oil and Natural Gas Investments, 2005-2009<sup>34</sup>**

	Return on \$1 invested in Plans	Return on \$1 invested in Oil and Natural Gas Stocks	Return on \$1 invested in Non-Oil and Natural Gas Investments	Total Gains by Plans (\$ million)	Gains from Oil and Natural Gas Investments (\$ million)	Gain from Oil and Natural Gas as Share of All Gains
<b>Total</b>	<b>\$1.18</b>	<b>\$1.48</b>	<b>\$1.11</b>	<b>\$40,730.2</b>	<b>\$4,643.0</b>	<b>11.6%</b>
<b>STRS</b>	\$1.15	\$1.41	\$1.09	\$17,659.9	\$2,200.8	12.5%
<b>OPERS</b>	\$1.20	\$1.54	\$1.13	\$23,070.3	\$2,442.2	10.6%

#### *All Ohio Public Employee Retirement Programs*

The Census Bureau issues aggregate annual data on Ohio public employee retirement plans, including members, benefits, and the value and distribution of their assets. Once again, only the data for 2005–2008 are available at this time; and since the returns on all investments and on oil and natural gas investments in particular fell sharply in 2009, these aggregate data covering four years cannot be strictly compared to the five years of data on the State's two largest plans. The data which are available show that all public employee retirement plans in Ohio covered 370,000 retirees and beneficiaries, 700,000 active employees, and nearly 500,000 inactive employees. The monthly benefit of all Ohio retirees under public employee pension plans averaged \$1,906. The Census Bureau also provides data on the allocation of these plans' assets by asset-class, again covering 2005-2008. (Table OH-3)

<sup>33</sup> Since STRS fiscal year ends on June 30 and OPERS' fiscal year ends on December 31, the returns of the S&P 500 Oil and natural gas Sector associated to the funds' fiscal year are different. For example, from July 1, 2009 to December 31, 2009, the S&P 500 Oil and natural gas Sector increased by 14.8 percent.

<sup>34</sup> Comprehensive Annual Financial Report; S&P's; and authors' estimates.

**Table OH-3. All Ohio Public Employee Retirement Plans:  
Assets and Asset Allocations, 2005-2008<sup>35</sup>**

Year	Total	U.S. Stocks: All Sectors	US Oil and Natural Gas Stocks	International Equities	Fixed Income	Other Assets
<i>As percentage of total assets</i>						
<b>2005</b>	100.0%	42.9%	4.0%	19.4%	21.1%	16.6%
<b>2006</b>	100.0%	41.9%	4.1%	20.5%	22.7%	14.8%
<b>2007</b>	100.0%	40.9%	5.3%	21.9%	22.1%	15.1%
<b>2008</b>	100.0%	37.4%	5.0%	22.2%	22.0%	18.5%
<i>In millions of US dollars</i>						
<b>2005</b>	136,819.2	\$58,741.1	\$5,462.9	\$26,490.6	\$28,897.6	\$22,689.8
<b>2006</b>	149,874.3	\$62,865.8	\$6,160.9	\$30,705.3	\$34,089.2	\$22,214.0
<b>2007</b>	166,416.4	\$68,054.5	\$8,779.0	\$36,483.0	\$36,784.1	\$25,094.8
<b>2008</b>	163,876.4	\$61,246.6	\$8,145.8	\$36,304.4	\$35,975.8	\$30,349.6

We calculate that \$1.00 invested in Ohio public employee retirement plans in July 2004 grew to \$1.46 in June 2008 (fiscal year ends on June 30). Over this period, \$1.00 invested in the S&P Energy Sector grew to \$2.48. If the Ohio plans had not invested in oil and natural gas stocks, \$1.00 invested in 2005 would have grown to \$1.34 in 2008.

Over these four years, annual returns fluctuated widely, ranging from 21.2 percent to negative 5.4 percent for all assets, and from 36.5 percent to 20.3 percent for oil and natural gas investments. (Table OH-4, below) Although these years are less representative without the 2009 data, we estimate that the System's oil and natural gas investments produced about \$7.1 billion of the System's total returns of \$63.8 billion. Therefore, oil and natural gas investments representing 4.6 percent of the System's total holdings contributed 11.2 percent of its gains over this period.

**Table OH-4. All Ohio Public Employee Retirement Plans,  
Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2008<sup>36</sup>**

Year	Annual Return on All Assets	Annual Return on Oil and Natural Gas Stocks	Return on \$1 of All Assets Invested in 2005	Return on \$1 Invested in Oil and Natural Gas in 2005	Return on \$1 of All Assets but Oil and Natural Gas Invested in 2005	Capital Gains/ Losses for all Assets (million)	Capital Gains/Losses of Oil and Natural Gas Investments (million)
<b>1/2005</b>			\$1.00	\$1.00	\$1.00		
<b>2005</b>	12.3%	36.5%	\$1.12	\$1.36	\$1.07	16,760.4	1,993.9
<b>2006</b>	13.7%	20.3%	\$1.28	\$1.64	\$1.21	20,577.7	1,248.5
<b>2007</b>	21.2%	24.5%	\$1.55	\$2.04	\$1.44	35,346.8	2,150.3

<sup>35</sup> U.S. Census' State & Local Government Employee Retirement Systems; and authors' estimates; Comprehensive Annual Financial Report; S&P's; and authors' estimates.

<sup>36</sup> *Ibid.*

<b>2008</b>	-5.4%	21.4%	\$1.46	\$2.48	\$1.34	(8,914.9)	1,742.2
<b>Total</b>						<b>\$63,770.1</b>	<b>\$7,135.0</b>

### ***Background - Ohio***

#### *The State Teachers Retirement System of Ohio*

The State Teachers Retirement System of Ohio provides pension benefits for all Ohio public school employees. Its membership consists of retirees and beneficiaries receiving benefits, current vested and non-vested employees, and inactive employees entitled to benefits but not yet receiving them. Membership averaged 470,000 persons over this period. (Table OH-5, below) The monthly pension payments paid to qualified retirees and beneficiaries averaged \$2,793.

**Table OH-5. State Teachers Retirement System of Ohio,  
Membership Classes and Monthly Benefit Payments, 2005-2009<sup>37</sup>**

<b>Year</b>	<b>Retirees and Beneficiaries</b>	<b>Active Employees</b>	<b>Inactive Employees</b>	<b>Total</b>	<b>Average Monthly Benefit Payments</b>
<b>2005</b>	115,395	n/a	n/a	454,692	\$2,557
<b>2006</b>	119,184	n/a	n/a	461,624	\$2,677
<b>2007</b>	122,934	n/a	n/a	469,475	\$2,796
<b>2008</b>	126,506	n/a	n/a	476,287	\$2,911
<b>2009</b>	129,659	n/a	n/a	486,333	\$3,025
<b>Average</b>	<b>122,736</b>	<b>n/a</b>	<b>n/a</b>	<b>469,682</b>	<b>\$2,793</b>

The assets of the Ohio State Teachers Retirement System are well diversified. Domestic equities accounted for the largest share of assets, representing 37.3 percent of total assets over this period. Investments in oil and natural gas companies are estimated based on the System's asset allocation and benchmarks. These oil and natural gas investments averaged 4.2 percent of total assets, ranging from 3.7 percent to 4.9 percent. (Table OH-6, below)

**Table OH-6. State Teachers Retirement System of Ohio,  
Asset Allocation, 2005-2009<sup>38</sup>**

<b>Year</b>	<b>Total</b>	<b>US Stocks: All Sectors</b>	<b>US Oil and Natural Gas Stocks</b>	<b>International Equities</b>	<b>Fixed Income</b>	<b>Other Assets</b>
<i>As percentage of total assets</i>						
<b>2005</b>	100.0%	44.2%	4.1%	19.1%	21.5%	15.2%
<b>2006</b>	100.0%	39.3%	3.9%	22.8%	22.7%	15.3%
<b>2007</b>	100.0%	37.8%	4.9%	22.3%	22.0%	17.9%
<b>2008</b>	100.0%	33.4%	4.4%	21.5%	20.9%	24.3%
<b>2009</b>	100.0%	31.8%	3.7%	21.0%	20.1%	27.2%
<i>In millions of US dollars</i>						
<b>2005</b>	\$59,636.8	\$26,359.5	\$2,451.4	\$11,390.6	\$12,821.9	\$9,064.8
<b>2006</b>	\$67,388.0	\$26,483.5	\$2,595.4	\$15,330.8	\$15,297.1	\$10,276.7
<b>2007</b>	\$79,599.2	\$30,104.4	\$3,883.5	\$17,774.5	\$17,511.8	\$14,208.5
<b>2008</b>	\$72,590.3	\$24,208.9	\$3,219.8	\$15,606.9	\$15,171.4	\$17,603.1

<sup>37</sup> State Teachers Retirement System of Ohio, Comprehensive Annual Financial Report.

<sup>38</sup> *Ibid.*, S&P's; and authors' estimates.

<b>2009</b>	\$54,736.5	\$17,378.8	\$1,998.6	\$11,467.3	\$11,002.0	\$14,888.3
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Using the System's reported annual returns, we calculate that \$1.00 invested in the Ohio State Teachers Retirement System in July 2004 grew to \$1.15 in June 2009 (the fiscal year ends on June 30). During this period, \$1.00 invested in the S&P Energy Sector grew to \$1.41. If the System had not invested in oil and natural gas stocks, \$1.00 invested in 2004 would have grown to \$1.09 in 2009.

We next estimate the annual capital gains and losses of the Ohio teachers' retirement system's total assets and the portion invested in oil and natural gas stocks. Over this period, the System's net gains totaled nearly \$17.7 billion, including \$2.2 billion in net gains from investments in the oil and natural gas sector. The oil and natural gas investments, then, accounted for 4.2 percent of the System's total assets but provided 12.5 percent of the System's total gains. (Table OH-7, below)

**Table OH-7. State Teachers Retirement of Ohio,  
Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2009<sup>39</sup>**

<b>Year</b>	<b>Annual Return on All Assets</b>	<b>Annual Return on Oil and Natural Gas Stocks</b>	<b>Return on \$1 of All Assets Invested in 2005</b>	<b>Return on \$1 in Oil and Natural Gas Assets Invested in 2005</b>	<b>Return on \$1 of Non-Oil and Natural Gas Assets Invested in 2005</b>	<b>Capital Gains/Losses from All Assets (million)</b>	<b>Capital Gains/Losses from Oil and Natural Gas Investments (million)</b>
<b>7/2004</b>			\$1.00	\$1.00	\$1.00		
<b>2005</b>	12.3%	36.5%	\$1.12	\$1.36	\$1.07	\$7,305.5	\$894.8
<b>2006</b>	13.7%	20.3%	\$1.28	\$1.64	\$1.21	\$9,252.4	\$526.0
<b>2007</b>	21.2%	24.5%	\$1.55	\$2.04	\$1.45	\$16,906.9	\$951.2
<b>2008</b>	-5.4%	8.1%	\$1.46	\$2.48	\$1.35	\$(3,948.9)	\$688.7
<b>2009</b>	-21.7%	-43.0%	\$1.15	\$1.41	\$1.09	\$(11,855.9)	\$(859.8)
<b>Total</b>						<b>\$17,659.9</b>	<b>\$2,200.8</b>

#### *Ohio Public Employees Retirement System*

The Ohio Public Employees Retirement System provides retirement, survivor and disability benefits to Ohio state government employees. The System's membership averaged almost 909,000 people, including retirees and beneficiaries currently receiving benefits, current employees including those vested and non-vested, and inactive employees entitled to benefits but not yet receiving them. (Table OH-8, below) The monthly pension payments to qualified retirees and beneficiaries averaged \$1,621 over this period.

<sup>39</sup> State Teachers Retirement System of Ohio, Comprehensive Annual Financial Report; S&P's; and authors' estimates.

**Table OH-8. Ohio Public Employees Retirement System,  
Membership Classes and Monthly Benefit Payments, 2005-2009<sup>40</sup>**

Year	Retirees and Beneficiaries	Active Employees	Inactive Employees	Total	Average Monthly Benefit Payments
2005	151,758	381,413	327,864	861,035	\$1,471
2006	156,747	381,464	346,697	884,908	\$1,545
2007	161,348	382,177	364,823	908,348	\$1,620
2008	166,516	374,002	395,445	935,963	\$1,696
2009	171,955	365,229	416,548	953,732	\$1,774
<b>Average</b>	<b>161,665</b>	<b>376,857</b>	<b>370,275</b>	<b>908,797</b>	<b>\$1,621</b>

The System's investments are well diversified across and within asset classes. Domestic equities are for the largest class of assets, averaging nearly 41 percent of the portfolio over this period. Investments in the oil and natural gas sector, calculated based on the System's asset allocation and benchmarks, accounted for an average of 4.6 percent of its total assets over this period. (Table OH-9, below)

**Table OH-9. Ohio Public Employees Retirement System,  
Asset Allocation, 2005-2009<sup>41</sup>**

Year	Total	US Stocks: All Sectors	US Oil and Natural Gas Stocks	International Equities	Fixed Income	Other Assets
<i>As percentage of total assets</i>						
2005	100.0%	44.1%	4.1%	20.2%	26.5%	9.2%
2006	100.0%	43.8%	4.3%	20.3%	27.7%	8.2%
2007	100.0%	40.7%	5.3%	21.4%	28.2%	9.7%
2008	100.0%	36.1%	4.8%	18.8%	31.4%	13.6%
2009	100.0%	40.0%	4.6%	22.7%	25.7%	11.6%
<i>In millions of US dollars</i>						
2005	\$69,191.9	\$30,513.6	\$2,837.8	\$13,976.8	\$18,335.8	\$6,365.7
2006	\$77,848.7	\$34,089.9	\$3,340.8	\$15,795.5	\$21,564.1	\$6,399.2
2007	\$83,032.1	\$33,794.1	\$4,359.4	\$17,777.2	\$23,390.1	\$8,070.7
2008	\$58,718.8	\$21,215.1	\$2,821.6	\$11,056.8	\$18,437.7	\$8,009.3
2009	\$68,562.1	\$27,452.2	\$3,157.0	\$15,556.7	\$17,599.9	\$7,953.2

Using the annual returns reported by the Ohio Public Employees Retirement System, we calculate that \$1.00 invested by the System in January 2005 grew to \$1.20 in December 2009 (the fiscal year ends on December 31). Over this period, \$1.00 invested in the S&P Energy Sector grew to \$1.54. If the System had not invested in oil and natural gas stocks, \$1.00 invested in 2005 would have grown to \$1.13 in 2009. We next estimate the annual capital gains and losses of this System's total assets and of the portion invested in oil and natural gas stocks. Over this period, the System's net gains totaled \$23 billion, including nearly \$2.44 billion in net gains from investments in the oil and natural gas sector. The oil and natural gas assets of the Ohio

<sup>40</sup> Ohio Public Employees Retirement System, Comprehensive Annual Financial Report.

<sup>41</sup> *Ibid.*, S&P's; and authors' estimates.



State Employees Retirement System, which accounted for 4.6 percent of its total assets, provided 10.6 percent of the System's total gains. (Table OH-10, below)

**Table OH-10. Ohio Public Employees Retirement System,  
Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2009<sup>42</sup>**

Year	Annual Return on All Assets	Annual Return on Oil and Natural Gas Stocks	Return on \$1 of All Assets Invested in 2005	Return on \$1 in Oil and Natural Gas Assets Invested in 2005	Return on \$1 of Non-Oil and Natural Gas Assets Invested in 2005	Capital Gains/Losses from All Assets (million)	Capital Gains/Losses from Oil and Natural Gas Investments (million)
<b>1/2005</b>			\$1.00	\$1.00	\$1.00		
<b>2005</b>	9.0%	33.3%	\$1.09	\$1.33	\$1.04	\$6,227.3	\$946.0
<b>2006</b>	14.7%	22.2%	\$1.25	\$1.63	\$1.18	\$11,443.8	\$742.1
<b>2007</b>	8.5%	32.4%	\$1.36	\$2.16	\$1.24	\$7,082.6	\$1,411.7
<b>2008</b>	-26.9%	-35.9%	\$0.99	\$1.38	\$0.93	(\$15,807.1)	(\$1,013.9)
<b>2009</b>	20.6%	11.3%	\$1.20	\$1.54	\$1.13	\$14,123.8	\$356.3
<b>Total</b>						<b>\$23,070.3</b>	<b>\$2,442.2</b>

## VI. Pennsylvania

### *The Two Largest Public Pension Plans*

The retirement plans for public employees in Pennsylvania (PA) publish annual data on their investment portfolios and performance. We collected those data for the two largest Pennsylvania public employees' retirement plans, the Pennsylvania Public School Employees' Retirement System (PSERS) and the Pennsylvania State Employees' Retirement System (SERS), for the years 2005-2009.<sup>43</sup> Over this period, the two plans had combined assets averaging \$86.4 billion and membership averaging than 650,000 people. (Table PA-1, below) The plans held \$2.9 billion in oil and natural gas stocks, 3.4 percent of total assets. The two plans account for over 67 percent of members and 74 percent of all assets of all Pennsylvania public pension plans.

**Table PA-1. Pennsylvania's Two Largest Public Employee Retirement Plans:  
Total Assets and Oil and Natural Gas Assets, 2005-2009<sup>44</sup>**

	Total Members	Total Assets (billions)	Oil and Natural Gas Assets (billions)	Oil and Natural Gas Assets as Share of All Assets
<b>Total</b>	<b>650,556</b>	<b>\$86.244</b>	<b>\$2.934</b>	<b>3.4%</b>
<b>PSERS</b>	434,618	\$57.444	\$2.097	3.5%
<b>SERS</b>	215,938	\$28.800	\$0.837	2.8%

<sup>42</sup> Ohio Public Employees Retirement System, Comprehensive Annual Financial Report; S&P's; and authors' estimates.

<sup>43</sup> The two plans use different fiscal years; so we set aside the difference to calculate their memberships and assets.

<sup>44</sup> Comprehensive Annual Financial Report; S&P's; and authors' estimates.



The overall rate of return on the assets of these two large plans averaged 18 percent for the five years 2005 - 2009. (Table PA-2, below) In contrast, S&P 500 Energy Sector produced around 48 percent return over the same period.<sup>45</sup> The two plans, therefore, generated total gains of more than \$29 billion over this period, including \$2.5 billion in gains from their investments in oil and natural gas stocks. As a result, oil and natural gas investments representing around 3.4 percent of the two plans' total assets contributed 8.6 percent of the two plans' gains.

**Table PA-2. Pennsylvania's Two Largest Public Employee Retirement Plans: Rates of Return and Gains Overall and from Oil and Natural Gas Investments, 2005-2009<sup>46</sup>**

	Return on \$1 invested in Plans	Return on \$1 invested in Oil and Natural Gas Stocks	Return on \$1 invested in Non-Oil and Natural Gas Investments	Total Gains by Plans (\$ million)	Gains from Oil and Natural Gas Investments (\$ million)	Gain from Oil and Natural Gas as Share of All Gains
<b>Total</b>	<b>\$1.18</b>	<b>\$1.48</b>	<b>\$1.15</b>	<b>\$29,378.8</b>	<b>\$2,519.3</b>	<b>8.6%</b>
<b>PSERS</b>	\$1.14	\$1.41	\$1.12	\$18,156.1	\$1,764.0	9.7%
<b>SERS</b>	\$1.22	\$1.54	\$1.19	\$11,222.7	\$755.3	6.7%

#### *All Pennsylvania Public Employee Retirement Programs*

The Census Bureau issues annual aggregate data on all Pennsylvania public employee retirement systems, including members, benefits, and assets. Once again, only the data covering 2005 – 2008 are available; and since the returns on all investments and oil and natural gas stocks in particular fell sharply in 2009, these four years of aggregate data cannot be strictly compared to the five years of data on Pennsylvania's two largest public employee pension plans. However, the available data show that all public employee retirement plans in Pennsylvania covered some 350,000 retirees and beneficiaries, 500,000 active employees, and nearly 100,000 inactive employees. The monthly benefit of all retirees under the State's public employee pension plans averaged \$1,760. The Census Bureau data also show the allocation of the plans' investments by asset-class for the years 2005-2008. (Table PA-3, below) The largest asset class held by Pennsylvania public employee pension plans was "other assets," including cash, short-term instruments, real estate and alternative investments, and which averaged 32.5 percent of the plans' total assets over the four years. U.S. equities accounted for an average of 28.2 percent of total assets, and U.S. oil and natural gas stocks represented an average of 3.1 percent of their total portfolios.

<sup>45</sup> Since the PSERS fiscal year ends on June 30 and the SERS fiscal year ends on December 31, the returns of the S&P 500 Oil and natural gas Sector associated with the funds' fiscal years are different. For example, from July 1, 2009 and December 31, 2009, the S&P 500 Oil and natural gas Sector increased by 14.8 percent.

<sup>46</sup> Comprehensive Annual Financial Report; S&P's; and authors' estimates.

**Table PA-3. All Pennsylvania Public Employee Retirement Plans:  
Assets and Asset Allocations, 2005-2008<sup>47</sup>**

Year	Total	U.S. Stocks: All Sectors	US Oil and Natural Gas Stocks	International Equities	Fixed Income	Other Assets
<i>As percentage of total assets</i>						
<b>2005</b>	100.0%	32.3%	3.0%	18.1%	20.7%	28.9%
<b>2006</b>	100.0%	33.5%	3.3%	19.8%	20.3%	26.3%
<b>2007</b>	100.0%	31.8%	4.1%	23.9%	18.7%	25.6%
<b>2008</b>	100.0%	15.0%	2.0%	19.1%	16.5%	49.3%
<i>In millions of US dollars</i>						
<b>2005</b>	\$95,165.4	\$30,778.9	\$2,862.4	\$17,210.5	\$19,718.4	\$27,457.6
<b>2006</b>	\$103,314.2	\$34,588.2	\$3,389.6	\$20,500.0	\$21,005.4	\$27,220.6
<b>2007</b>	\$118,310.0	\$37,639.5	\$4,855.5	\$28,271.4	\$22,081.5	\$30,317.5
<b>2008</b>	\$117,173.2	\$17,564.9	\$2,336.1	\$22,437.8	\$19,363.5	\$57,806.9

We calculate that \$1.00 invested by Pennsylvania public employee pension plans in July 2004 grew to \$1.55 in July 2009 (the fiscal year ends on June 30). Over this period, \$1.00 invested in the S&P Energy Sector grew to \$2.48. If these plans had not invested in oil and natural gas stocks, \$1.00 invested in 2005 would have grown to \$1.50 in 2008.

Over the four years, the annual returns on the System's assets fluctuated widely, from 22.9 percent to negative 2.8 percent for all assets, and from 20.3 percent to 36.5 percent for oil and natural gas assets. (Table PA-4, below) Although these years are less representative without 2009, oil and natural gas investments by the State's public employee pension plans represented \$3.4 billion of their total \$52 billion in returns for this period. Oil and natural gas assets representing 3.1 percent of total holdings contributed 6.6 percent of the gains over this period.

**Table PA-4. All Pennsylvania Public Employee Retirement Plans,  
Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2008<sup>48</sup>**

Year	Annual Return on All Assets	Annual Return on Oil and Natural Gas Stocks	Return on \$1 of All Assets Invested in 2005	Return on \$1 in Oil and Natural Gas Assets Invested in 2005	Return on \$1 of Non- Oil and Natural Gas Assets Invested in 2005	Capital Gains/ Losses from All Assets (million)	Capital Gains/ Losses from Oil and Natural Gas Investments (million)
<b>7/2004</b>			\$1.00	\$1.00	\$1.00		
<b>2005</b>	12.9%	36.5%	\$1.13	\$1.36	\$1.09	\$12,247.8	\$1,044.8
<b>2006</b>	15.3%	20.3%	\$1.30	\$1.64	\$1.25	\$15,765.7	\$686.9
<b>2007</b>	22.9%	24.5%	\$1.60	\$2.04	\$1.52	\$27,128.5	\$1,189.3

<sup>47</sup> U.S. Census' State & Local Government Employee Retirement Systems; Comprehensive Annual Financial Report; S&P's; and authors' estimates.

<sup>48</sup> *Ibid.*

<b>2008</b>	-2.8%	21.4%	\$1.55	\$2.48	\$1.50	(\$3,304.3)	\$499.7
<b>Total</b>						<b>\$51,837.7</b>	<b>\$3,420.7</b>

### ***Background - Pennsylvania***

#### ***Pennsylvania Public School Employees' Retirement System***

The Pennsylvania Public School Employees' Retirement System provides pension benefits for all public school employees in the State. The System's membership, as in all states, consists of retirees and beneficiaries receiving benefits, current vested and non-vested employees, and inactive employees not yet receiving benefits due them. However, the System reports only current retirees and beneficiaries and current employees. The monthly pension paid to qualified retirees and beneficiaries averaged \$1,749 over the 2005-2009 period. (Table PA-5)

**Table PA-5. Pennsylvania Public School Employees' Retirement System, Membership Classes and Monthly Benefit Payments, 2005-2009<sup>49</sup>**

<b>Year</b>	<b>Retirees and Beneficiaries</b>	<b>Active Employees</b>	<b>Inactive Employees</b>	<b>Total</b>	<b>Average Monthly Benefit Payments</b>
<b>2005</b>	156,519	255,465	n/a	n/a	\$1,612
<b>2006</b>	161,813	263,350	n/a	n/a	\$1,686
<b>2007</b>	168,026	264,023	n/a	n/a	\$1,748
<b>2008</b>	173,540	272,690	n/a	n/a	\$1,830
<b>2009</b>	177,963	279,701	n/a	n/a	\$1,871
<b>Average</b>	<b>167,572</b>	<b>267,046</b>	n/a	n/a	<b>\$1,749</b>

The Public School Employees' Retirement System's investments are well diversified. Domestic equities' share declined in recent years, while "Other Assets" increased. (Table PA-6, below) Investments in oil and natural gas stocks are estimated based on the System's asset allocation and benchmarks. U.S. equity investments in oil and natural gas companies accounted for an average of 3.5 percent of the System's total assets over this period.

**Table PA-6. Pennsylvania Public School Employees' Retirement System, Assets and Asset Allocation, 2005-2009<sup>50</sup>**

<b>Year</b>	<b>Total</b>	<b>US Stocks: All Sectors</b>	<b>US Oil and Natural Gas Stocks</b>	<b>International Equities</b>	<b>Fixed Income</b>	<b>Other Assets</b>
<i>As percentage of total assets</i>						
<b>2005</b>	100.0%	42.5%	4.0%	19.0%	22.0%	16.5%
<b>2006</b>	100.0%	39.6%	3.9%	22.8%	21.7%	15.9%
<b>2007</b>	100.0%	32.0%	4.1%	28.3%	20.5%	19.2%
<b>2008</b>	100.0%	29.1%	3.9%	22.5%	20.8%	27.6%
<b>2009</b>	100.0%	16.4%	1.9%	16.0%	28.6%	39.0%
<i>In millions of US dollars</i>						
<b>2005</b>	\$52,739.7	\$22,414.4	\$2,084.5	\$10,020.5	\$11,602.7	\$8,702.1
<b>2006</b>	\$58,719.3	\$23,252.8	\$2,278.8	\$13,388.0	\$12,742.1	\$9,336.4

<sup>49</sup> Pennsylvania Public School Employees' Retirement System, Comprehensive Annual Financial Report.

<sup>50</sup> *Ibid.*, S&P's; and authors' estimates.

<b>2007</b>	\$68,526.5	\$21,928.5	\$2,828.8	\$19,393.0	\$14,047.9	\$13,157.1
<b>2008</b>	\$63,892.2	\$18,592.6	\$2,472.8	\$14,375.7	\$13,289.6	\$17,634.3
<b>2009</b>	\$43,343.9	\$7,108.4	\$817.5	\$6,935.0	\$12,396.4	\$16,904.1

Using the annual returns reported by the Pennsylvania Public School Employees Retirement System, we calculate that \$1.00 invested in July 2004 grew to \$1.14 in June 2009 (the fiscal year ends on June 30). Over this period, \$1.00 invested in the S&P Energy Sector grew to \$1.41. If the System had not invested in oil and natural gas stocks, \$1.00 invested in 2004 would have grown to \$1.12 in 2009.

We next estimate the System's annual capital gains and losses on all of its assets and on the portion invested in oil and natural gas stocks. Over this period, the System's net gains totaled nearly \$18.2 billion, including nearly \$2.1 billion in net gains from investments in the oil and natural gas sector. The oil and natural gas investments which accounted for 3.5 percent of the System's total assets provided 11.5 percent of its total gains. (Table PA-7, below)

**Table PA-7. Pennsylvania Public School Employees' Retirement System, Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2009<sup>51</sup>**

<b>Year</b>	<b>Annual Return on All Assets</b>	<b>Annual Return on Oil and Natural Gas Stocks</b>	<b>Return on \$1 of All Assets Invested in 2005</b>	<b>Return on \$1 in Oil and Natural Gas Assets Invested in 2005</b>	<b>Return on \$1 of Non-Oil and Natural Gas Assets Invested in 2005</b>	<b>Capital Gains/Losses from All Assets (million)</b>	<b>Capital Gains/Losses from Oil and Natural Gas Investments (million)</b>
<b>7/2004</b>			\$1.00	\$1.00	\$1.00		
<b>2005</b>	12.9%	36.5%	\$1.13	\$1.36	\$1.07	\$6,787.6	\$760.8
<b>2006</b>	15.3%	20.3%	\$1.30	\$1.64	\$1.24	\$8,960.6	\$461.8
<b>2007</b>	22.9%	24.5%	\$1.60	\$2.04	\$1.51	\$15,713.1	\$692.9
<b>2008</b>	-2.8%	8.1%	\$1.55	\$2.48	\$1.46	\$(1,801.8)	\$528.9
<b>2009</b>	-26.5%	-43.0%	\$1.14	\$1.41	\$1.12	\$(11,503.5)	\$(351.7)
<b>Total</b>						<b>\$18,156.1</b>	<b>\$2,092.7</b>

#### *Pennsylvania State Employees' Retirement System*

The Pennsylvania State Employees' Retirement System provides retirement, survivor and disability benefits to employees of the state government. The System's membership includes retirees and beneficiaries currently receiving benefits, current employees including those vested and non-vested, and inactive employees entitled to benefits but not yet receiving them. Once again, the system does not provide data on inactive employees. Monthly pension payments to qualified retirees and beneficiaries averaged \$1,418 over this period. (Table PA-8, below)

<sup>51</sup> Pennsylvania Public School Employees' Retirement System, Comprehensive Annual Financial Report; S&P's; and authors' estimates.

**Table PA-8. Pennsylvania State Employees' Retirement System,  
Membership Classes and Monthly Benefit Payments, 2005-2009<sup>52</sup>**

Year	Retirees and Beneficiaries	Active Employees	Inactive Employees	Total	Average Monthly Benefit Payments
2005	101,179	109,981	n/a	n/a	\$1,318
2006	102,060	110,972	n/a	n/a	\$1,352
2007	107,130	109,610	n/a	n/a	\$1,437
2008	108,146	110,866	n/a	n/a	\$1,470
2009	109,639	110,107	n/a	n/a	\$1,510
Average	105,631	110,307	n/a	n/a	\$1,418

The State Employees' Retirement System's investments are diversified across and within asset classes. Here, too, investments in equities – domestic oil and natural gas and international – all declined in recent years; while investments in “other assets” rose sharply. (Table PA-9, below) The System's investments in the oil and natural gas sector are calculated based on the asset allocation and benchmarks. Equity investments in oil and natural gas companies accounted for between 1.7 percent and 3.5 percent of the System's total assets over this period, and averaged 2.8 percent of those assets.

**Table PA-9. Pennsylvania State Employees' Retirement System,  
Assets and Asset Allocation, 2005-2009<sup>53</sup>**

Year	Total	US Stocks: All Sectors	US Oil and Natural Gas Stocks	International Equities	Fixed Income	Other Assets
<i>As percentage of total assets</i>						
2005	100.0%	34.0%	3.2%	20.9%	16.0%	29.1%
2006	100.0%	35.8%	3.5%	20.5%	15.3%	28.4%
2007	100.0%	24.9%	3.2%	20.3%	13.8%	41.0%
2008	100.0%	19.6%	2.6%	13.7%	14.3%	52.4%
2009	100.0%	14.5%	1.7%	10.9%	11.8%	62.8%
<i>In millions of US dollars</i>						
2005	\$28,805.2	\$9,793.8	\$910.8	\$6,020.3	\$4,608.8	\$8,382.3
2006	\$32,100.5	\$11,492.0	\$1,126.2	\$6,580.6	\$4,911.4	\$9,116.5
2007	\$35,542.2	\$8,850.0	\$1,141.7	\$7,215.1	\$4,904.8	\$14,572.3
2008	\$22,907.4	\$4,489.9	\$597.2	\$3,138.3	\$3,275.8	\$12,003.5
2009	\$24,644.2	\$3,573.4	\$410.9	\$2,686.2	\$2,908.0	\$15,476.6

Using the annual returns reported by the State Employees' Retirement System, we calculate that \$1.00 invested by the System in January 2005 grew to \$1.22 in December 2009 (the fiscal year ends on December 31). Over this period, \$1.00 invested in the S&P Energy Sector grew to \$1.54. If the System had not invested in any oil and natural gas stocks, \$1.00 invested in 2005 would have grown to \$1.19 in 2009.

<sup>52</sup> Pennsylvania State Employees' Retirement System, Comprehensive Annual Financial Report.

<sup>53</sup> *Ibid.*, S&P's; and authors' estimates.

We next estimate the annual capital gains and losses of the System's total assets and of the portion invested in oil and natural gas stocks. Over this period, the System's net gains totaled more than \$11.2 billion, including about \$755 million in net gains from its investments in oil and natural gas companies. These oil and natural gas investments accounted for 2.8 percent of the System's total assets and provided 6.7 percent of the System's total gains. (Table PA-10)

**Table PA-10. Pennsylvania State Employees' Retirement System,  
Returns and Gains for All Assets and Oil and Natural Gas Investments, 2005-2009<sup>54</sup>**

<b>Year</b>	<b>Annual Return on All Assets</b>	<b>Annual Return on Oil and Natural Gas Stocks</b>	<b>Return on \$1 of All Assets Invested in 2005</b>	<b>Return on \$1 in Oil and Natural Gas Assets Invested in 2005</b>	<b>Return on \$1 of Non- Oil and Natural Gas Assets Invested in 2005</b>	<b>Capital Gains/ Losses from All Assets (million)</b>	<b>Capital Gains/ Losses from Oil and Natural Gas Investments (million)</b>
<b>1/2005</b>			\$1.00	\$1.00	\$1.00		
<b>2005</b>	14.5%	33.3%	\$1.15	\$1.33	\$1.10	\$4,176.8	\$303.6
<b>2006</b>	16.4%	22.2%	\$1.33	\$1.63	\$1.28	\$5,264.5	\$250.2
<b>2007</b>	17.2%	32.4%	\$1.56	\$2.16	\$1.49	\$6,113.3	\$369.7
<b>2008</b>	-28.7%	-35.9%	\$1.11	\$1.38	\$1.08	(\$6,574.4)	(\$214.6)
<b>2009</b>	9.1%	11.3%	\$1.22	\$1.54	\$1.19	\$2,242.6	\$46.4
<b>Total</b>						<b>\$11,222.7</b>	<b>\$755.3</b>

<sup>54</sup> Pennsylvania State Employees' Retirement System, Comprehensive Annual Financial Report; and authors' estimates; S&P's; and authors' estimates.

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### *About the Authors*

**Robert J. Shapiro** is the chairman and co-founder of Sonecon, LLC, a private firm that advises U.S. and foreign businesses, governments and non-profit organizations on market conditions and economic policy. He is also a Senior Fellow of the Georgetown University School of Business, advisor to the International Monetary Fund, director of the Globalization Initiative at NDN, chair of the U.S. Climate Task Force, co-chair of the America Task Force Argentina, and a director of the Ax:son-Johnson Foundation in Sweden. From 1997 to 2001, Dr. Shapiro was Under Secretary of Commerce for Economic Affairs. In that post, he directed economic policy for the Commerce Department and oversaw the nation's major statistical agencies, including the Census Bureau before and during the 2000 decennial census. Prior to that, he was co-founder and Vice President of the Progressive Policy Institute, Legislative Director for Senator Daniel P. Moynihan, and Associate Editor of *U.S. News & World Report*. Dr. Shapiro also served as the principal economic advisor to Governor Bill Clinton in his 1991-1992 presidential campaign, and senior economic advisor to Vice President Albert Gore, Jr. and Senator John Kerry in their presidential campaigns. In the 2008 campaign, he advised the campaign and transition of Barack Obama. Dr. Shapiro has been a Fellow of Harvard University, the Brookings Institution, and the National Bureau of Economic Research. He holds a Ph.D. and M.A. from Harvard University, a M.Sc. from the London School of Economics and Political Science, and an A.B. from the University of Chicago. He is widely published in scholarly and popular journals, and his most recent book is *Futurecast: How Superpowers, Populations and Globalization Will Change the Way You Live and Work*, St. Martins Press: 2008.

**Nam D. Pham** is the managing partner of NDP Group, LLC, an economics consulting firm that specializes in assessing complex issues in finance, industrial organization and international trade. Clients of NDP Group include U.S. and foreign corporations, financial institutions, federal and local governments, trade associations and multi-national organizations. Prior to founding NDP Group in 2000, Dr. Pham was Vice President at Scudder Kemper Investments in Boston, where he was responsible for research, asset allocations and currency hedges for Scudder's global and international bond funds. Before that, he was Chief Economist of the Asia Region for Standard & Poor's DRI in Boston. Dr. Pham's has more than twenty years of experience in multinational organizations and government agencies in Washington D.C. This tenure includes posts as an economist at the World Bank and a consultant to the Department of Commerce and the Federal Trade Commission. In addition, Dr. Pham has been an adjunct professor at the George Washington University, where he has taught undergraduate and graduate courses in monetary economics, international trade and finance, macroeconomics and microeconomics. Dr. Pham earned a Ph.D. in economics from the George Washington University with concentrations in international trade and finance, economic development and applied microeconomics, a M.A. from Georgetown University and a B.A. from the University of Maryland.