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External management fees are treated as a reduction of the investment revenue of the Fund rather than as a budgeted administrative expense.

Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)

<u>Manager</u>	<u>Total Fees</u>
<u>U.S. Equity</u>	
AH Lisanti Capital Growth, LLC	\$ (26)
AllianceBernstein LP	79
Radcliffe Capital Management, L.P.	3,144
Total - U.S. Equity	3,197
<u>Non - U.S. Equity</u>	
Acadian Asset Management, LLC	859
Baillie Gifford Overseas Ltd.	2,949
Batterymarch Financial Management, Inc.	557
BlackRock Financial Management, Inc.	6,400
BlackRock Institutional Trust Company, N.A.	2,855
Marathon Asset Management Limited	2,955
Oberweis Asset Management, Inc.	1,401
Pareto Investment Management, Ltd.	954
Pyramis Global Advisors Trust Company	1,061
Wasatch Advisors, Inc.	4,295
Total - Non - U.S. Equity	24,286
<u>Fixed Income</u>	
AllianceBernstein L.P.	729
Apollo European Principal Finance Fund II(Dollar A), L.P.	2,567
Avenue Energy Opportunities Fund, L.P.	1,185
Avenue Europe Special Situations Fund III (U.S.), L.P.	375
Bain Capital Credit Managed Account (PSERS), L.P.	1,631
Bain Capital Distressed and Special Situations 2013 (A), L.P.	2,614
Bain Capital Distressed and Special Situations 2016 (A), L.P.	92
Bain Capital Middle Market Credit 2010, L.P.	507
Bain Capital Middle Market Credit 2014, LP	1,143
BlackRock Financial Management, Inc.	6,147
Bridgewater Associates, LP	16,871
Brigade Capital Management, LLC	978
Cargill Financial Services Corporation	6,472
Carlyle Energy Mezzanine Opportunities Fund II, L.P.	1,555
Carlyle Energy Mezzanine Opportunities Fund-Q, L.P.	1,282
Cerberus Levered Loan Opportunities Fund I, L.P.	587

() Represents reversal of amount accrued in prior fiscal year.

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Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)
(continued)

<u>Manager</u>	<u>Total Fees</u>
Fixed Income (continued)	
Cerberus Levered Loan Opportunities Fund II, L.P.	\$ 3,481
Cerberus PSERS Levered Loan Opportunities Fund, L.P.	1,390
Galton Onshore Mortgage Recovery Fund III, L.P.	790
Hayfin Credit Opp Fund, L.P.	2,745
ICG Europe Fund V, L.P.	1,886
ICG Europe Fund VI, L.P.	1,851
International Infrastructure Finance Company, L.P.	1,500
LBC Credit Partners II, L.P.	916
LBC Credit Partners III, L.P.	3,207
Mariner Investment Group, LLC	571
Oaktree Loan Fund 2X, LP	51
Pacific Investment Management Company (PIMCO)	4,641
Park Square - PSERS Credit Opportunities Fund, L.P.	861
Piedmont Investment Advisors, LLC	43
Pugh Capital Management, Inc.	183
PSERS TAO Partners Parallel Fund, L.P.	1,608
Radcliffe Capital Management, L.P.	2,016
Sankaty Credit Opportunities IV, L.P.	1,725
SEI Investments Company	640
Stone Harbor Investment Partners, L.P.	672
Templeton Investment Counsel, LLC	1,713
TOP NPL (A), L.P.	79
TPG Opportunities Partners II (A), L.P.	484
TPG Opportunities Partners III (A), L.P.	2,239
Varde Scratch and Dent Fund, L.P., The	<u>1,769</u>
Total - Fixed Income	81,796
Real Estate-Direct Ownership	
Charter Oak Advisors, Inc.	1,084
GF Management, Inc.	131
Grosvenor Investment Management U.S., Inc.	12
L & B Realty Advisors, L.L.P.	<u>87</u>
Subtotal - Real Estate-Direct Ownership	1,314
Real Estate-Partnerships/Funds	
AG Core Plus Realty Fund III, L.P.	626
AG Core Plus Realty Fund IV, L.P.	179

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Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)
(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Real Estate-Partnerships/Funds (continued)</u>	
Almanac Realty Securities V, L.P.	\$ 563
Almanac Realty Securities VI, L.P.	236
Almanac Realty Securities VII, L.P.	1,355
Apollo European Real Estate Fund III, L.P.	345
Apollo European Real Estate Fund IV, L.P.	1,253
Apollo Real Estate Finance Corporation	100
Apollo Value Enhancement Fund VII, L.P.	1,047
Apollo Value Enhancement Fund VIII, L.P.	901
Avenue Real Estate Fund Parallel, L.P.	1,138
Beacon Capital Strategic Partners V, L.P.	201
Bell Institutional Fund IV, LLC	660
Bell Institutional Fund V, LLC	645
BlackRock Asia Property Fund III, L.P.	490
BlackRock Europe Property Fund III, L.P.	485
Blackstone Real Estate Debt Strategies II, L.P.	1,142
Blackstone Real Estate Partners Europe III, L.P.	1,514
Blackstone Real Estate Partners Europe IV, L.P.	1,500
Blackstone Real Estate Partners VI.TE.1, L.P.	1,671
Blackstone Real Estate Partners VII.TE.1, L.P.	2,788
Blackstone Real Estate Partners VIII, L.P.	3,333
Brookfield Strategic Real Estate Partners, L.P.	2,250
Brookfield Strategic Real Estate Partners II, L.P.	172
Cabot Industrial Value Fund IV, L.P.	1,151
Carlyle Realty Partners IV, L.P.	796
Carlyle Realty Partners V, L.P.	849
Carlyle Realty Partners VI, L.P.	509
Carlyle Realty Partners VII, L.P.	905
DRA Growth and Income Fund VI, L.P.	598
DRA Growth and Income Fund VII, L.P.	1,639
DRA Growth and Income Fund VIII, L.P.	1,114
Exeter Core Industrial Club Fund II, L.P.	12
Exeter Industrial Value Fund II, L.P.	493
Exeter Industrial Value Fund III, L.P.	786
Fillmore West Fund, L.P.	2
Fortress Investment Fund IV, L.P.	573
Fortress Investment Fund V (Fund A), L.P.	2,271
JPMCB Strategic Property Fund	265

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Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)
(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Real Estate-Partnerships/Funds (continued)</u>	
Latitude Management Real Estate Capital III, Inc.	\$ 848
Legg Mason Real Estate Capital II, Inc.	592
LEM RE High Yield Debt & Preferred Equity Fund III, L.P.	562
LEM Real Estate Mezzanine Fund II, L.P.	140
Madison Marquette Retail Enhancement Fund, L.P.	(400)
Paladin Realty Latin America Investors III, L.P.	385
Paramount Group Real Estate Fund VII, L.P.	629
Peabody Global Real Estate Partners, L.P.	12
Pramerica Real Estate Capital VI, L.P.	148
PRISA	745
RCG Longview Debt Fund IV, L.P.	189
RCG Longview Debt Fund V, L.P.	941
RCG Longview Equity Fund, L.P.	298
Senior Housing Partnership Fund IV, L.P.	716
Senior Housing Partnership Fund V, L.P.	1,117
Silverpeak Legacy Pension Partners II, L.P.	306
Silverpeak Legacy Pension Partners III, L.P.	499
Silverpeak/PSERS Real Estate, L.P.	77
Stockbridge Real Estate Fund, L.P.	1,952
Stockbridge Real Estate Fund II, L.P.	627
Stockbridge Real Estate Fund III, L.P.	2,280
Strategic Partners Fund II RE, L.P.	53
Strategic Partners Fund IV RE, L.P.	219
UBS (US) Trumbull Property Fund, L.P.	960
Subtotal - Real Estate-Partnerships/Funds	50,452
<u>Real Estate-Farmland</u>	
Prudential Agricultural Group	240
Subtotal - Real Estate-Farmland	240
Total Real Estate	52,006
<u>Private Equity</u>	
ABS Capital Partners II, L.P.	1
Actis Emerging Markets 3, L.P.	2,282
Actis Global 4 L.P.	1,798
Bain Capital Asia Fund III, L.P.	573

() Represents reversal of amount accrued in prior fiscal year.

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Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)
(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Private Equity (continued)</u>	
Bain Capital XI, L.P.	\$ 750
Baring Asia Private Equity Fund III, L.P.	633
Baring Asia Private Equity Fund IV, L.P.	2,978
Baring Asia Private Equity Fund V, L.P.	3,349
Barings Asia Private Equity Fund VI, L.P.	1,453
Blue Point Capital Partners III (B), L.P.	574
Bridgepoint Europe III-A, L.P.	23
Bridgepoint Europe IV, L.P.	2,237
Bridgepoint Europe V, L.P.	915
Capital International Private Equity Fund V, L.P.	820
Capital International Private Equity Fund VI, L.P.	1,189
Catterton Growth Partners, L.P.	840
Catterton Growth Partners II, L.P.	1,195
Catterton Growth Partners III, L.P.	698
Catterton Partners V, L.P.	379
Catterton Partners VI, L.P.	1,131
Catterton Partners VII, L.P.	1,757
Cinven Fund (Fourth), L.P. (The)	833
Cinven Fund (Fifth), L.P. (The)	764
Coller International Partners VI, L.P.	1,286
Crestview Capital Partners, L.P.	283
Crestview Partners II (PF), L.P.	1,352
CVC Capital Partners Asia III Pacific, L.P.	708
CVC European Equity Partners V (A), L.P.	720
DCPF VI Oil and Gas Co-Investment Fund, L.P.	55
Denham Commodity Partners Fund VI, L.P.	1,264
Energy & Mineral Group Fund III, L.P.	1,235
Equistone Partners Europe Fund V E, L.P.	1,127
Evergreen Pacific Partners II, L.P.	272
First Reserve Fund XI, L.P.	753
First Reserve Fund XII, L.P.	1,445
GoldPoint Partners Co-Investment V, L.P.	500
HgCapital 7, L.P.	1,888
HGGC Fund II, L.P.	439
Incline Equity Partners III, L.P.	589
Irving Place Capital Partners III, L.P.	446
Landmark Equity Partners XIII, L.P.	399

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Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)
(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Private Equity (continued)</u>	
Landmark Equity Partners XIV, L.P.	\$ 1,490
Milestone Partners II, L.P.	154
Milestone Partners III, L.P.	93
Milestone Partners IV, L.P.	820
New Mountain Partners III, L.P.	1,386
New Mountain Partners IV, L.P.	1,210
New York Life Capital Partners III, L.P.	609
New York Life Capital Partners IV, L.P.	467
NGP Natural Resources X, L.P.	1,207
NGP Natural Resources XI, L.P.	759
North Haven PE Asia Fund IV, L.P.	1,495
Odyssey Investment Partners Fund V, L.P.	1,980
Orchid Asia V, L.P.	405
Orchid Asia VI, L.P.	1,500
PAI Europe IV, L.P.	752
PAI Europe V, L.P.	1,059
PAI Europe VI, L.P.	1,585
Palladium Equity Partners IV, L.P.	859
Partners Group Secondary 2008, L.P.	1,383
Partners Group Secondary 2011, L.P.	1,766
Partners Group Secondary 2015 (USD) A, L.P.	744
Permira IV, L.P.	498
PNC Equity Partners II, L.P.	44
StepStone International Investors III, L.P.	636
Strategic Partners II, L.P.	381
Strategic Partners III-B, L.P.	500
Strategic Partners IV, L.P.	346
Strategic Partners V, L.P.	860
Strategic Partners VI, L.P.	1,125
Trilantic Capital Partners IV, L.P.	211
Trilantic Capital Partners V, L.P.	1,193
Subtotal - Private Equity	69,450
<u>Private Debt</u>	
Apollo Investment Fund VIII, L.P.	1,749
Avenue Asia Special Situations Fund IV, L.P.	1,047
Avenue Special Situations Fund VI, L.P.	193

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Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)

(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Private Debt (continued)</u>	
Cerberus Institutional Partners, L.P. (Series Three)	\$ 80
Cerberus Institutional Partners, L.P. (Series Four)	1,058
Cerberus Institutional Partners V, L.P.	2,215
Cerberus Institutional Partners VI, L.P.	2,069
Clearlake Capital Partners IV, L.P.	748
Coller International Partners VII, L.P.	648
Gleacher Mezzanine Fund II, L.P.	38
GSC Recovery III, L.P.	270
NYLIM Mezzanine Partners Parallel Fund II, L.P.	97
OCM Opportunities Fund VII, L.P.	270
OCM Opportunities Fund VII-B, L.P.	456
Searchlight Capital II, L.P.	634
Venor Special Situations Fund II, L.P.	352
Versa Capital Fund, L.P.	718
Versa Capital Fund II, L.P.	434
Versa Capital Fund III, L.P.	951
Windjammer Senior Equity Fund IV, L.P.	<u>1,219</u>
Subtotal - Private Debt	15,246
<u>Venture Capital</u>	
Aisling Capital II, L.P.	262
Aisling Capital III, L.P.	399
Aisling Capital IV, L.P.	145
Co-Investment Fund II, L.P. (The)	1,334
KBL Partnership, L.P.	114
LLR Equity Partners II, L.P.	179
LLR Equity Partners III, L.P.	1,969
LLR Equity Partners IV, L.P.	3,500
Psilos Group Partners III, L.P.	252
Quaker BioVentures II, L.P.	989
SCP Private Equity Partners II, L.P.	422
Starvest Partners II, L.P.	397
Strategic Partners III-VC, L.P.	181
Strategic Partners IV VC, L.P.	230
Summit Partners Growth Equity Fund VIII, L.P.	750

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Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)

(continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Venture Capital (continued)</u>	
Tenaya Capital V-P, LP	\$ 787
Tenaya Capital VI, L.P.	1,000
Tenaya Capital VII, L.P.	<u>1,886</u>
Subtotal - Venture Capital	14,796
Total Alternative Investments	99,492
<u>Absolute Return</u>	
Aeolus Capital Management Ltd.	9,125
BlackRock Financial Management, Inc.	18,176
Brevan Howard Asset Management LLP	3,695
Bridgewater Associates, Inc.	21,053
Brigade Capital Management, LLC	3,458
Capula Global Relative Value Fund	5,836
Capula Tail Risk Fund	7,639
Caspian Select Credit International, Ltd.	8,459
Garda Asset Management LLC	6,739
Independence Reinsurance Partners GP, LLC	889
Nephila Capital Ltd.	3,598
Oceanwood Capital Management L.L.P.	(2,148)
One William Street Capital Management, L.P.	2,113
Pacific Investment Management Company (PIMCO)	8,863
Perry Partners, L.P.	2,131
Sciens Aviation Spec Opp Inv Fund II	2,085
Sciens Aviation Spec Opp Inv Fund III	<u>2,553</u>
Total - Absolute Return	104,264
<u>Commodities</u>	
Gresham Investment Management, LLC	609
Wellington Management Company, L.L.P.	<u>3,423</u>
Total - Commodities	4,032

() Represents reversal of amount accrued in prior fiscal year.

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Table 11.3 Investment Fees by Manager
Fiscal Year Ended June 30, 2016
(Dollar Amounts in Thousands)
 (continued)

<u>Manager</u>	<u>Total Fees</u>
<u>Master Limited Partnerships</u>	
Harvest Fund Advisors, LLC	\$ 3,273
Salient Capital Advisors, LLC	2,476
Stein Roe Investment Counsel D/B/A Atlantic Trust	<u>2,584</u>
Total - Master Limited Partnerships	8,333
<u>Risk Parity</u>	
AQR Capital Management, LLC	1,841
BlackRock Institutional Trust Company, N.A.	2,076
Bridgewater All Weather Fund @15%, Ltd.	4,109
Bridgewater Optimal Portfolios, Ltd.	3,889
D. E. Shaw & Co., L.P.	<u>6,513</u>
Total - Risk Parity	18,428
Total External Management	395,834
Total Internal Management	<u>9,669</u> *
Total Investment Management	<u>\$ 405,503</u>

*Internal Management expenses include salaries and fringe benefits of \$6,719 and operating expenses of \$2,950.

Investment Fees and Expenses Initiatives

PSERS continues to pursue several avenues intended to maintain a reasonable cost structure. These initiatives include:

- Identifying opportunities to invest more assets internally. PSERS' current staffing levels are too low to significantly increase internal asset management, but we continue to work with the Administration to look for ways to reduce investment fees by increasing internal investment staff. PSERS continues to believe this is in the best interests of both the Fund and the Commonwealth and, therefore, has included additional positions in the FY2017-18 budget request.
- For external managers making traditional investments, reduce base fees and create better alignment of interests by moving to a lower base fee coupled with a profit share.
- For external managers making traditional and absolute return investments, enter into arrangements for netting of profit shares for managers with multiple PSERS mandates.
- For external managers making non-traditional investments, continue to grow co-investments (which have lower fees and profit shares).
- For external managers making non-traditional investments, move away from paying on committed capital and towards paying on invested capital.
- For external managers, re-underwriting all fee arrangements to ensure that the fee arrangements are fair and equitable.