

Fixed Income Performance

Arizona State Retirement System

April 17, 2018

Total Fixed Income Allocation

Fixed Income Positioning versus Interim SAA as of March 31, 2018				
	Actual	SAA Target	Interim SAA	Over/(Under) Interim SAA
Total Fixed Income	26.1%	25.0%	25.0%	1.1%
Interest Rate Sensitive	9.8%	11.0%	12.0%	-2.2%
High Yield	0.8%	2.0%	2.0%	-1.2%
Private Debt	11.4%	12.0%	11.0%	0.4%
Opportunistic Debt	4.1%	0.0%	0.0%	4.1%

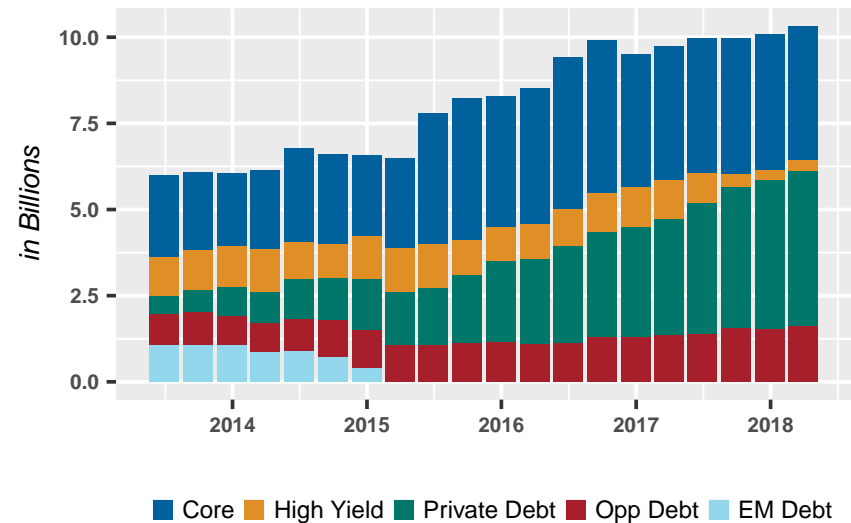
¹ Interim SAA prorates unfunded Private Debt to Interest Rate Sensitive and High Yield.

Total Fixed Income

Annualized Returns - TWRs

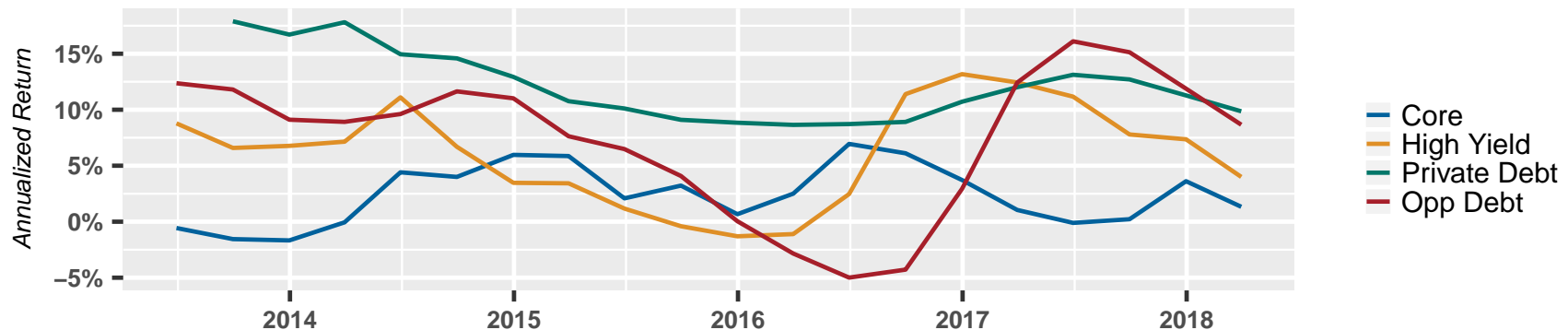
	1 Year	3 Year	5 Year
Core Fixed Income	1.33	1.63	2.12
Barclay's Aggregate	1.20	1.20	1.82
Core Composite Excess	0.13	0.43	0.29
High Yield	4.00	4.96	5.09
Barclay's HY Index	3.78	5.17	4.99
HY Composite Excess	0.22	-0.21	0.09
Private Debt	9.86	10.16	11.77
S&P/LSTA Leveraged Loan + 250bps	6.05	6.78	6.45
Private Debt Excess	3.81	3.39	5.32
Opportunistic Debt	8.66	5.88	6.83
Fixed 8% Return	8.00	8.00	8.00
Opportunistic Debt Excess	0.66	-2.12	-1.17

Total Fixed Income Market Values



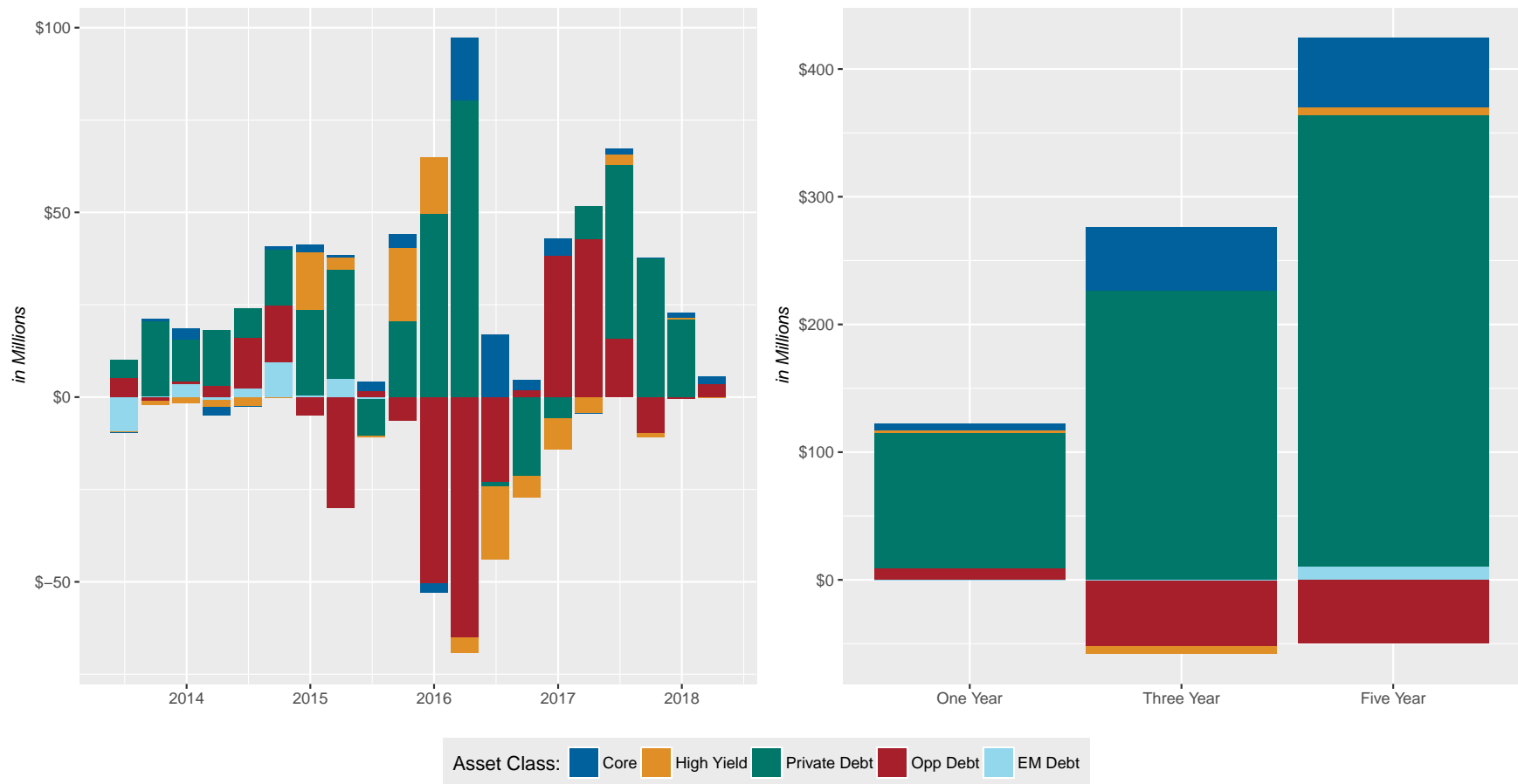
Total Fixed Income Rolling Returns

One Year Trailing Returns through March 31, 2018



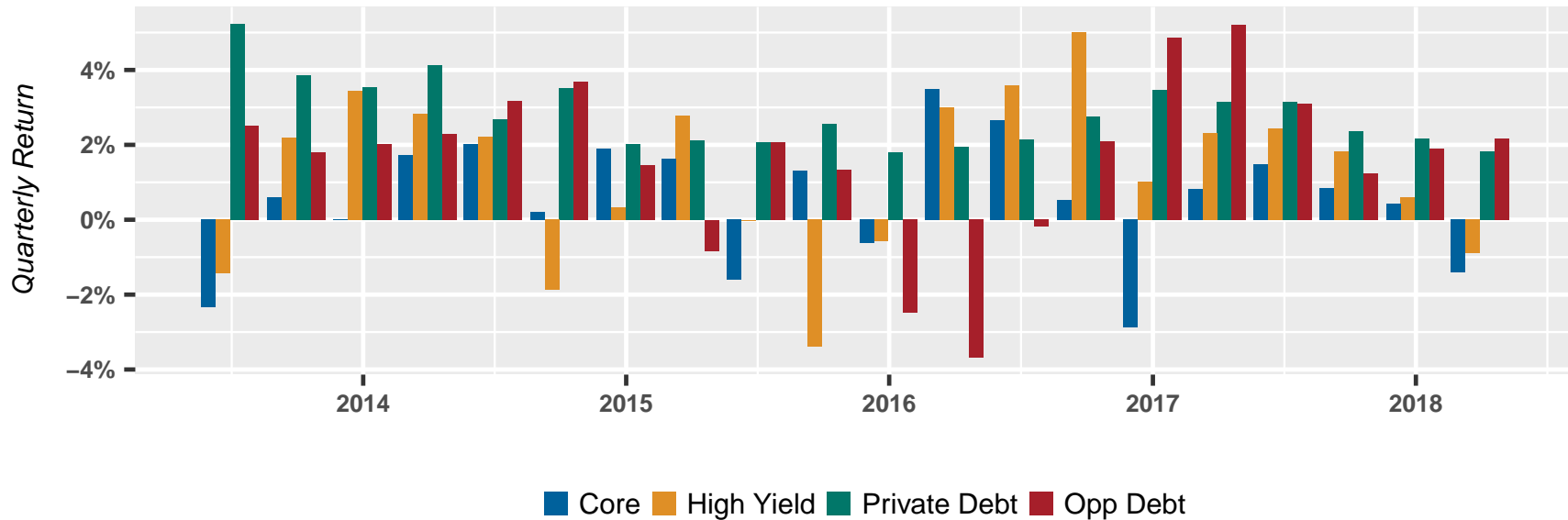
Total Fixed Income Dollar Value Added

**Total Fixed Income Dollar Value Added
Relative to Sub-Asset Class Benchmarks**

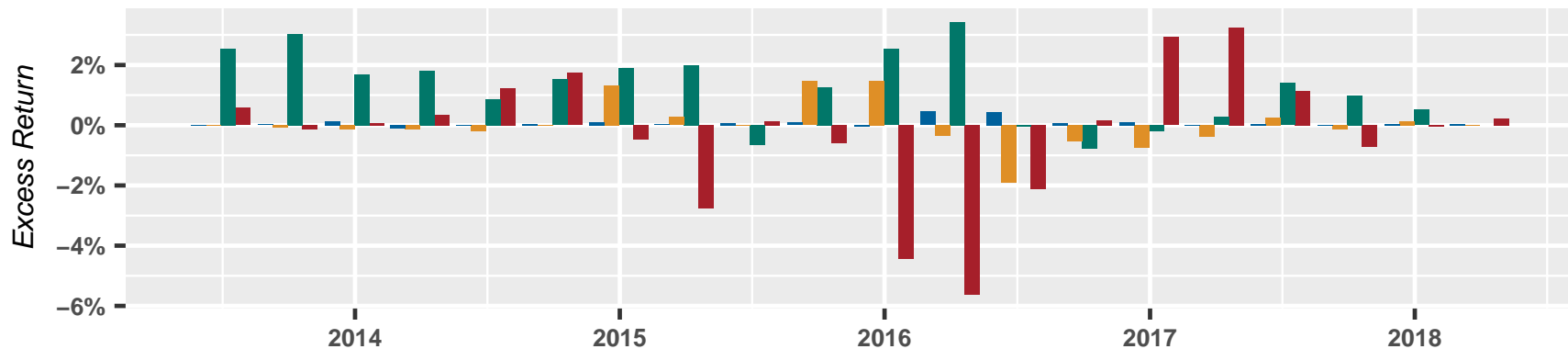


Total Fixed Income Quarterly Returns

Total Fixed Income Quarterly Return



Total Fixed Income Quarterly Excess Return

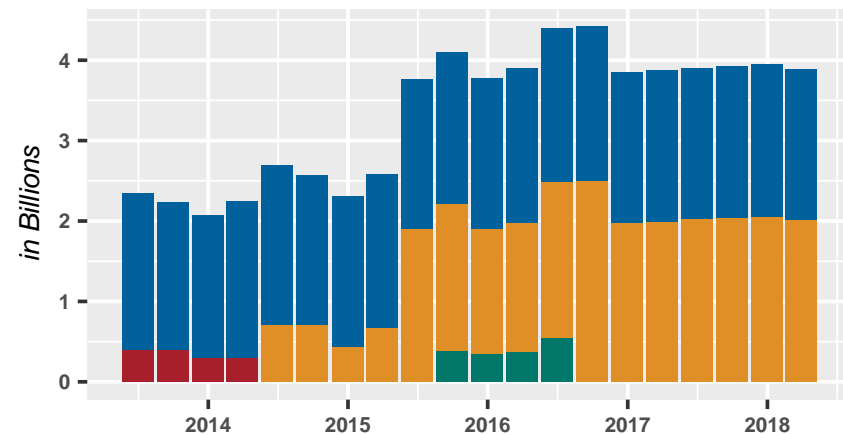


Core Fixed Income

Annualized Returns

	1 Year	3 Year	5 Year
Core Composite	1.33	1.63	2.12
Barclay's Aggregate	1.20	1.20	1.82
Core Composite Excess	0.13	0.43	0.29
F2 Model	1.38	1.43	2.07
Barclay's Aggregate	1.20	1.20	1.82
F2 Excess	0.18	0.23	0.24
BlackRock US Debt Fund	1.30	1.30	
Barclay's Aggregate	1.20	1.20	
BlackRock Excess	0.10	0.10	

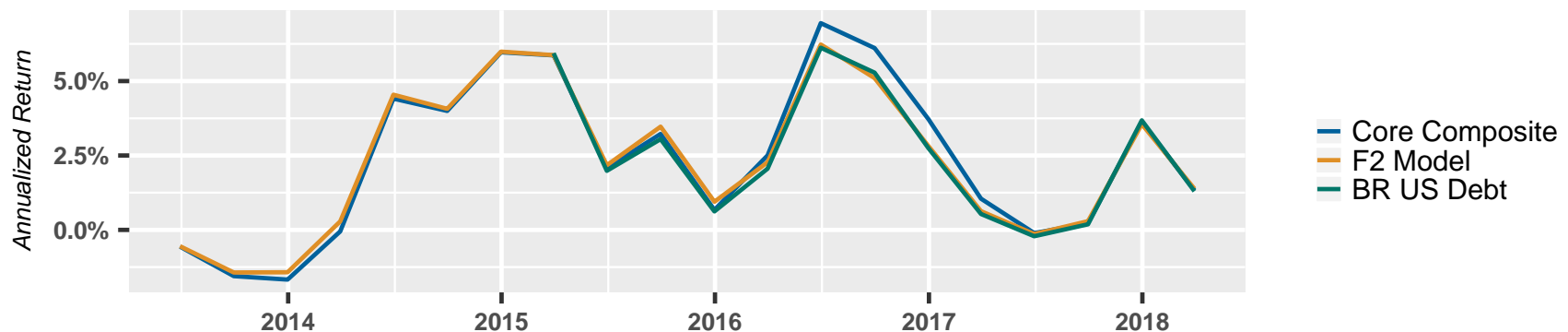
Core Market Values



F2 Model BR US Debt BR Treasury PIMCO

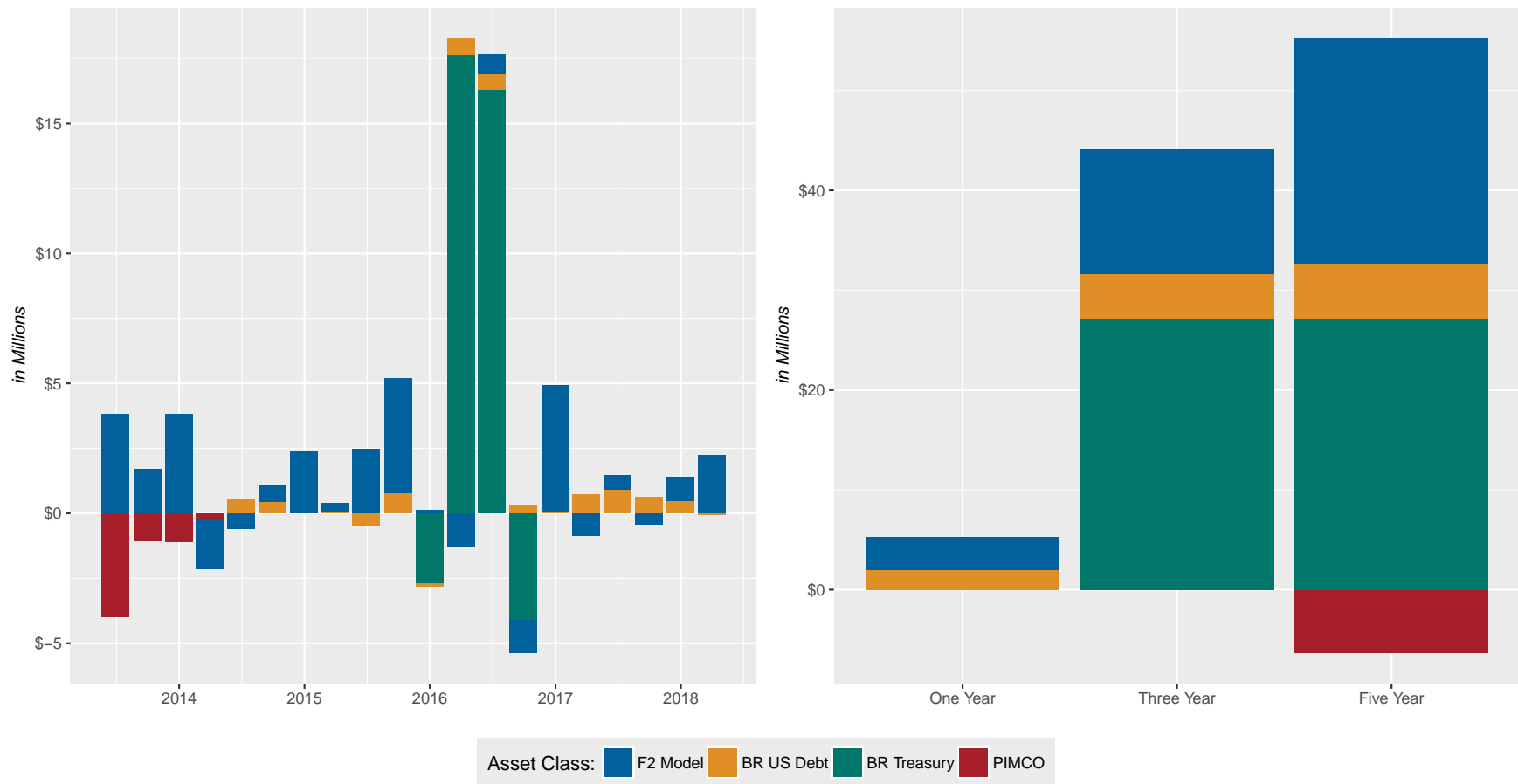
Core Rolling Returns

One Year Trailing Returns through March 31, 2018



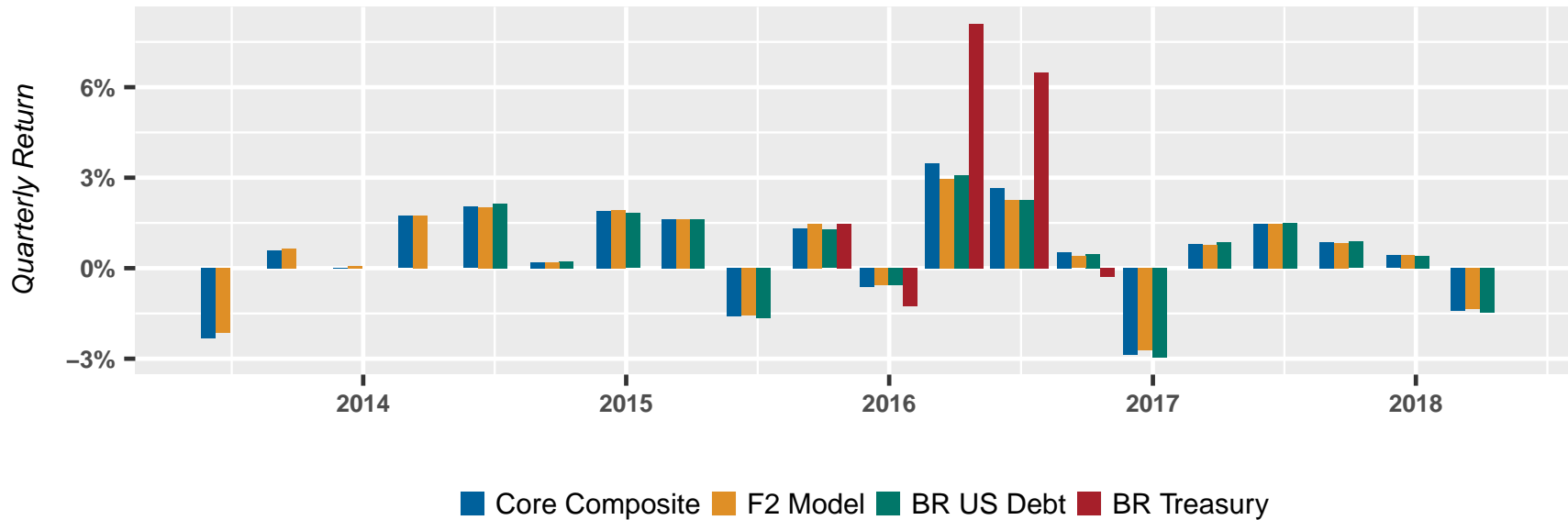
Core Fixed Income Dollar Value Added

**Core Fixed Income Dollar Value Added
Relative to Barclay's Aggregate Benchmark**

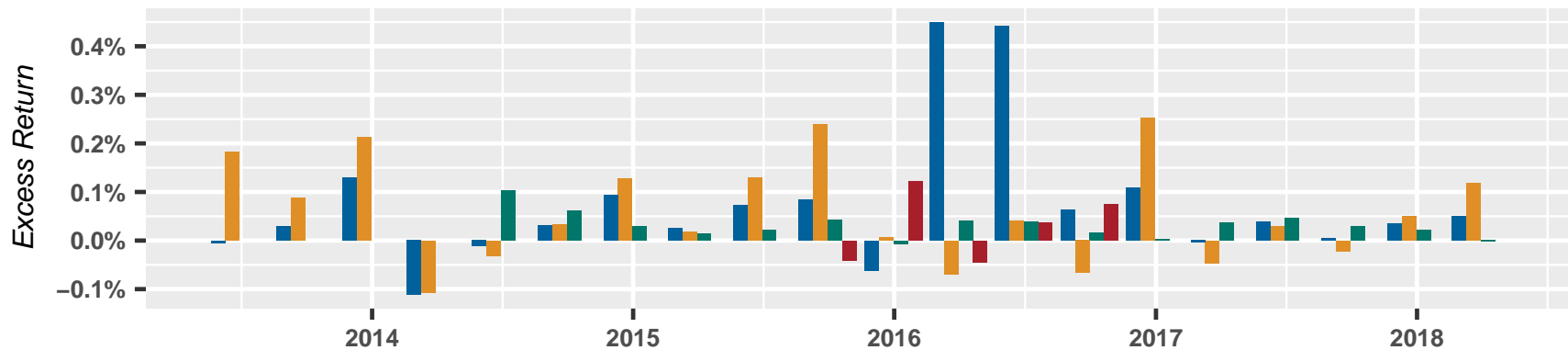


Core Fixed Income Quarterly Returns

Core Quarterly Return



Core Quarterly Excess Return

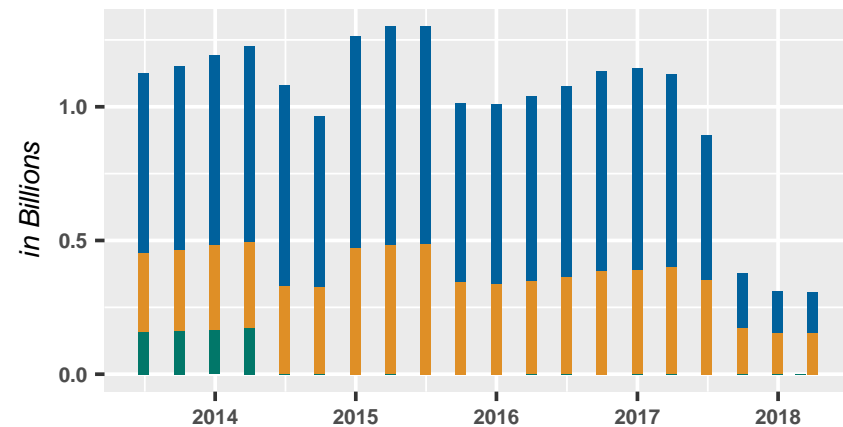


High Yield

Annualized Returns

	1 Year	3 Year	5 Year
High Yield Composite	4.00	4.96	5.09
Barclay's HY Index	3.78	5.17	4.99
Composite Excess	0.22	-0.21	0.09
Columbia	2.96	4.59	4.95
Barclay's HY Index	3.78	5.17	4.99
Columbia Excess	-0.82	-0.58	-0.05
JP Morgan	5.44	5.51	
Barclay's HY Index	3.78	5.17	
JP Morgan Excess	1.66	0.34	

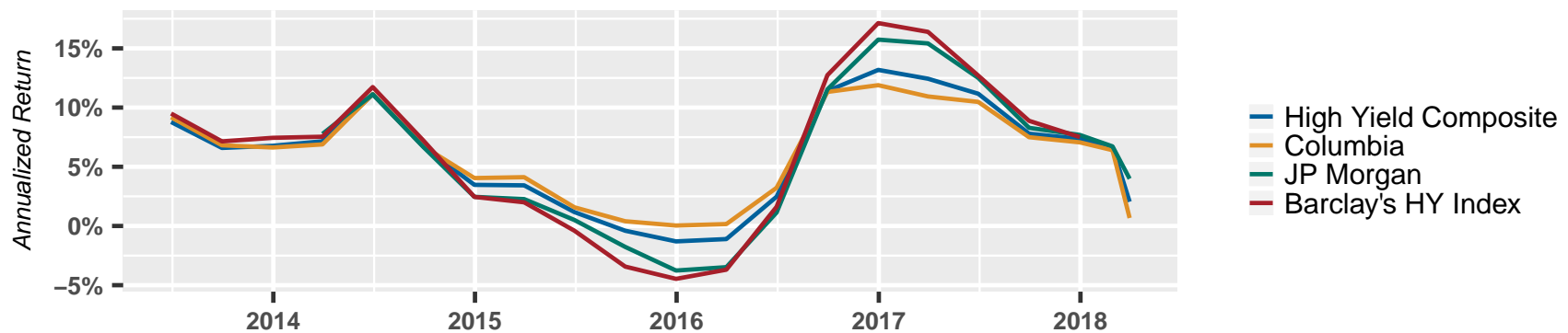
High Yield Market Values



■ Columbia ■ JP Morgan ■ Shenkman

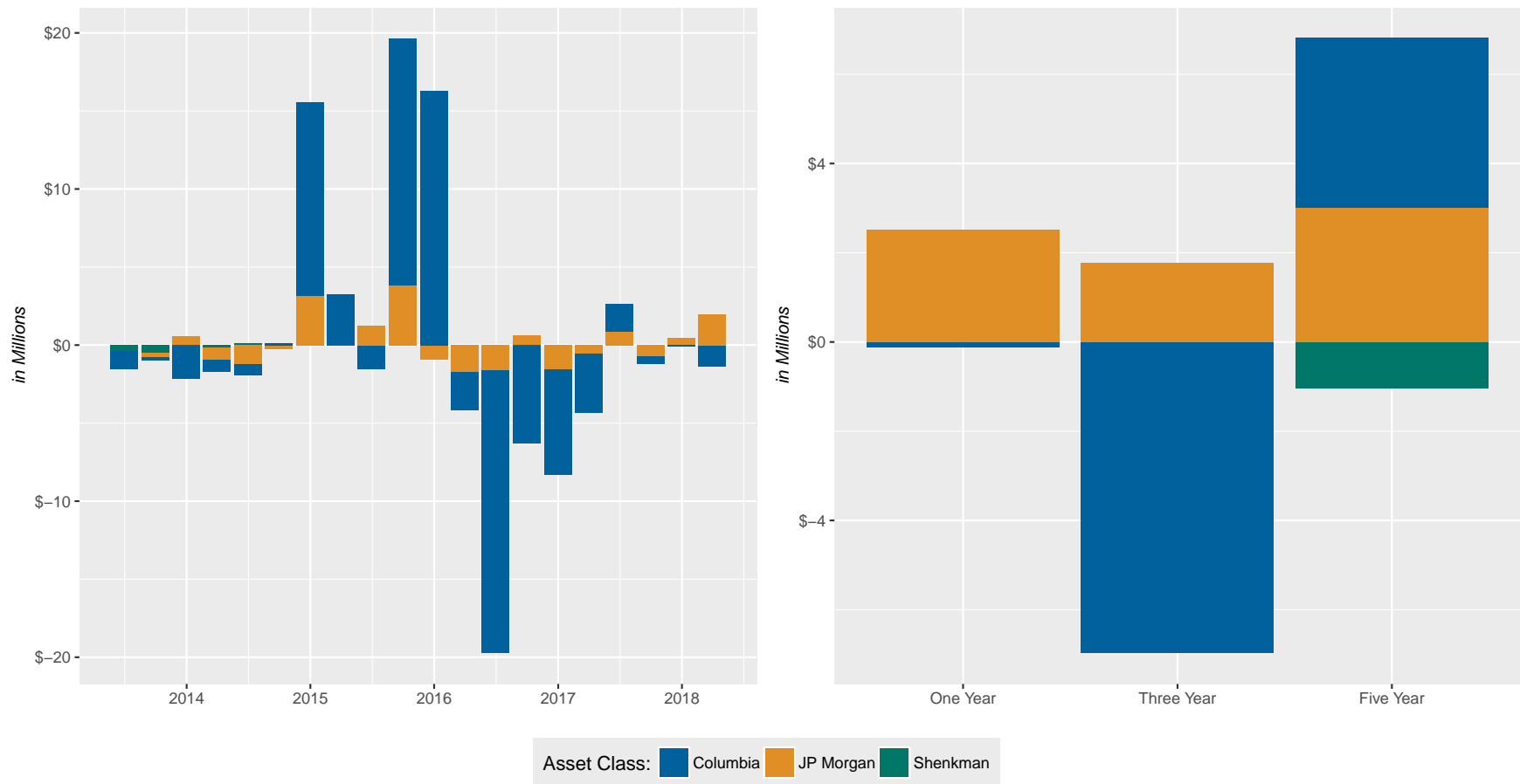
High Yield Rolling Returns

One Year Trailing Returns through March 31, 2018



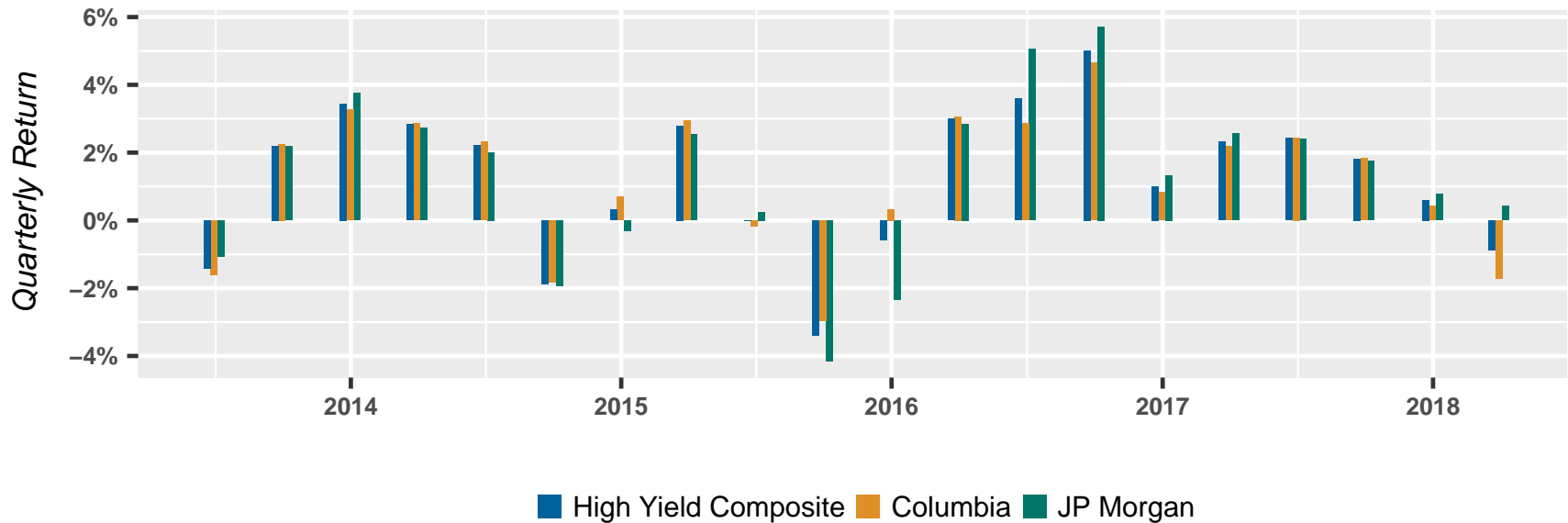
High Yield Dollar Value Added

**High Yield Dollar Value Added
Relative to Barclay's High Yield Benchmark**

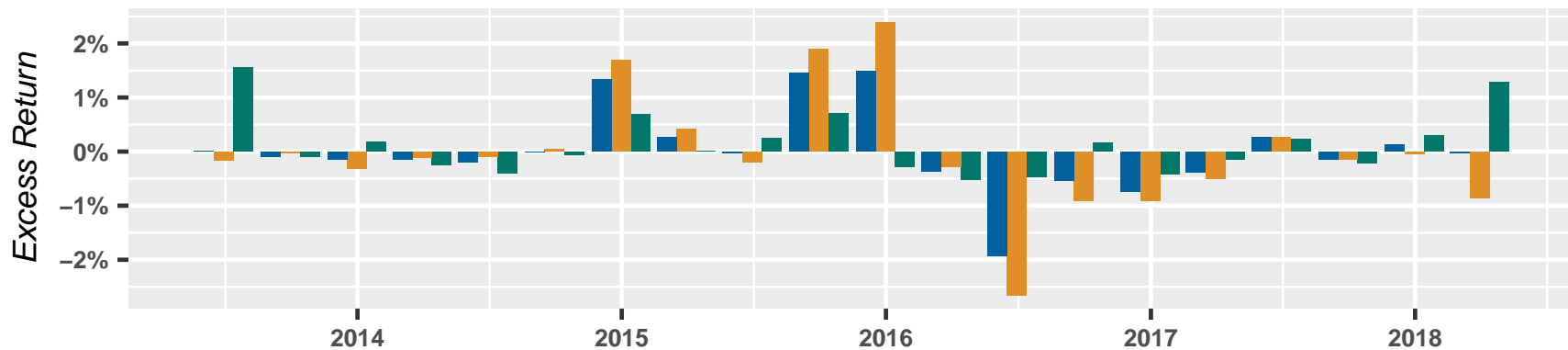


High Yield Quarterly Returns

High Yield Quarterly Return



High Yield Quarterly Excess Return

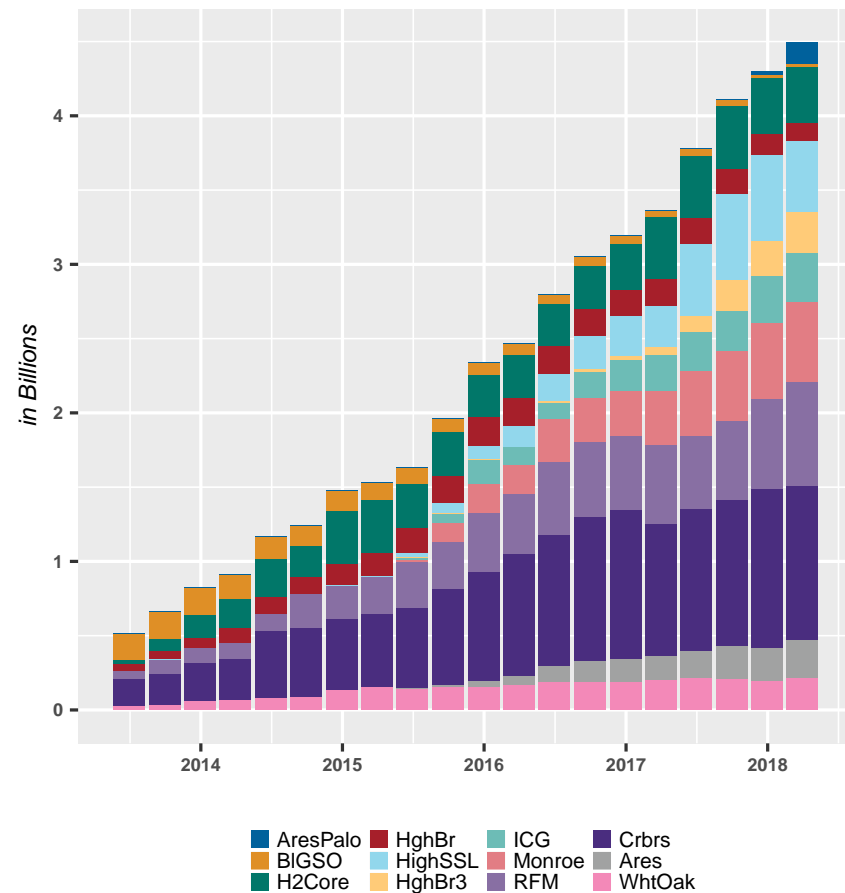


Private Debt

Private Debt IRRs

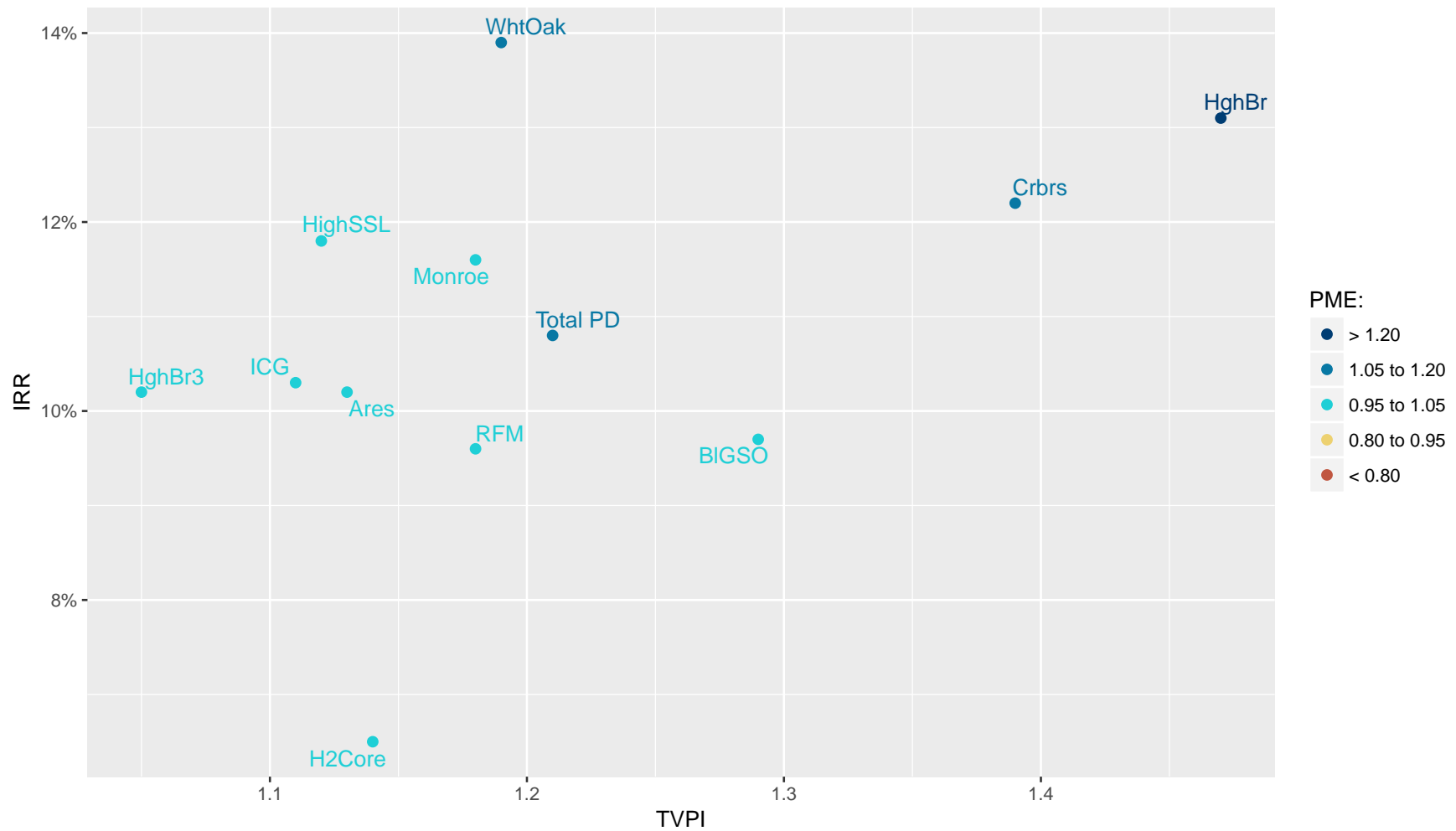
	QTR	1 YEAR	3 YEAR	ITD
Total.PD	1.9	9.8	10.2	10.8
Benchmark	1.7	6.7	7.4	7.0
BIGSO	-2.3	-2.4	-3.9	9.7
H2Core	1.5	6.7	6.9	6.5
HghBr	0.0	8.0	12.2	13.1
HighSSL	2.0	8.8		11.8
HghBr3	3.1	11.0		10.2
ICG	2.3	10.7		10.3
Monroe	2.0	10.7		11.6
RFM	2.3	11.5	9.9	9.6
Crbrs	1.5	10.6	11.6	12.2
Ares	2.4	9.0		10.2
WhtOak	2.8	11.3	11.9	13.9

Private Debt Market Values



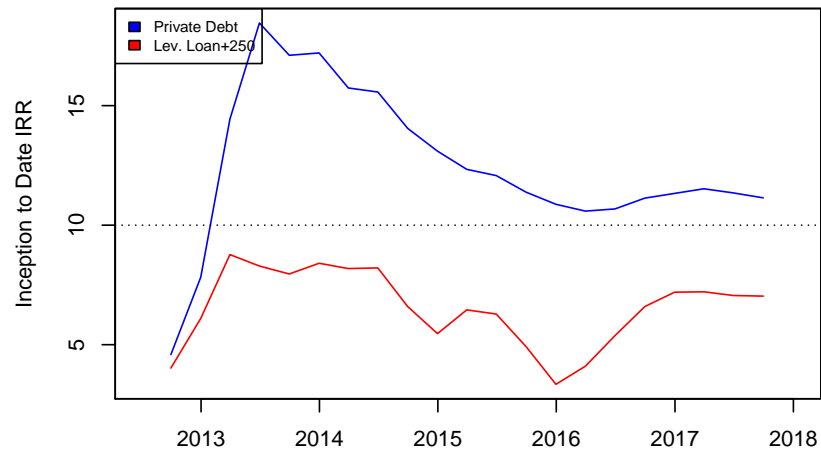
Private Debt: TVPI and PME

Comparison of Private Debt Strategies

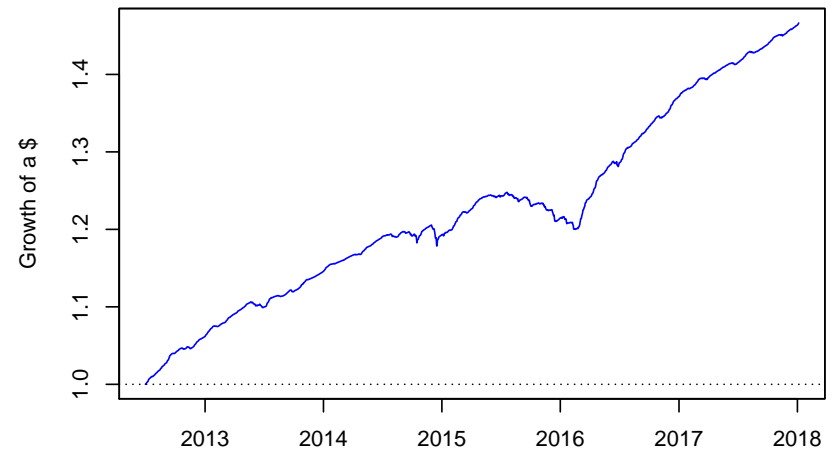


Private Debt Portfolio

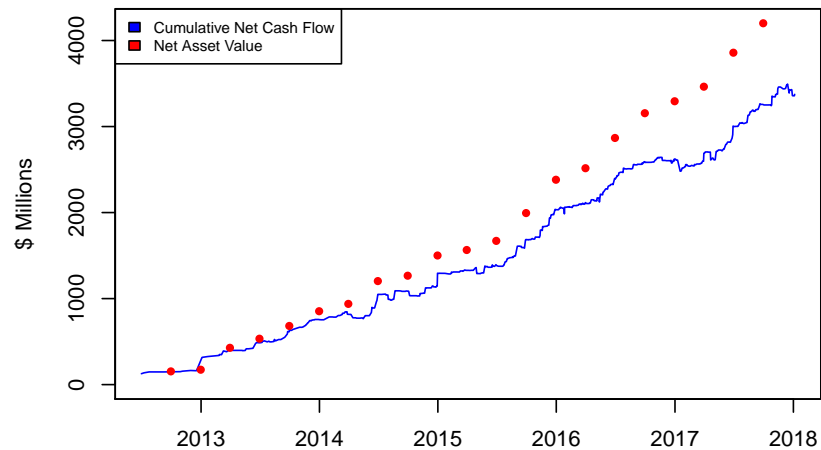
**Private Debt IRRs
compared to Lev Loan+250**



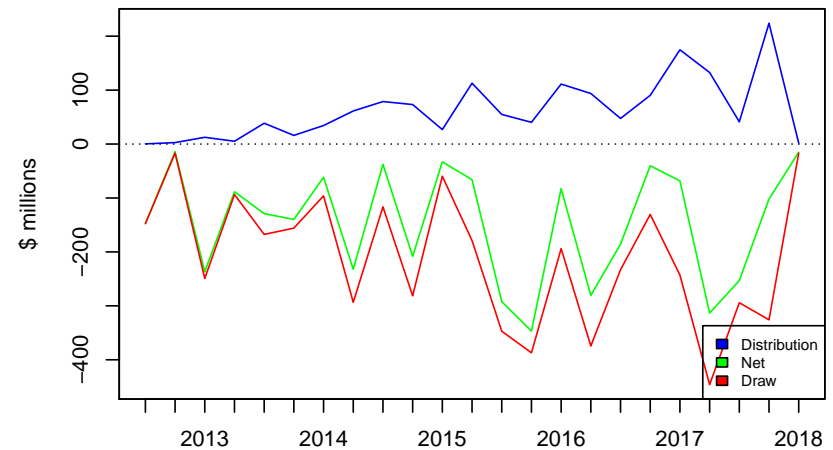
Lev Loan+250



**Private Debt Cumulative Net Capital Contributed
Compared to Value**



**Private Debt
Quarterly Draws and Distributions**



Private Debt: United States Corporate

Portfolio	Commitment (\$MM)	Market Value 3/31/2018	Target Net Return	IMD Commentary
Sonoran Private Credit Opportunities Fund, LLC (Managed by Cerberus)	\$1,200	\$1,040	13%	Separate account that invests in floating-rate secured loans primarily to fund private-equity sponsored middle market leveraged transactions . The LLC can leverage ASRS's investment by up to 1.5x to boost returns.
Cactus Direct Lending Fund, LP (Partnership with HPS)	\$850	\$475	12%	Fund-of-one partnership that invests in floating-rate secured loans primarily to fund middle market leveraged transactions (ex. buyouts, recapitalizations) often without a private equity sponsor. The partnership can leverage ASRS's equity investment by up to 1.25x to boost returns.
Monroe Private Credit Fund A	\$850	\$538	11%	Fund-of-one partnership that invests in floating-rate secured loans primarily to fund smaller middle market leveraged transactions . The partnership can leverage ASRS's equity investment by up to 1.5x to boost returns.
AP Mezzanine Partners III , LP (Partnership with HPS)	\$500	\$270	11%	Fund-of-one partnership that invests primarily in mezzanine debt to fund highly leveraged transactions for larger capitalization companies.
Arizona – White Oak Investor LLC	\$300	\$236	12%	Separate account that invests in floating-rate secured loans for small- to mid-size companies typically lacking a deal sponsor.
AP Mezzanine Partners II, LP (Partnership with HPS, in liquidation)	\$145	\$120	11%	Fund-of-one partnership that invests primarily in mezzanine debt to fund highly leveraged transactions for larger capitalization companies. Investment period expired 6/30/16.
Blackstone/GSO Capital Solutions Fund (in liquidation)	\$22	\$22	13%	Commingled fund which provided rescue financing to companies seeking to avoid a bankruptcy or restructuring. Investment period ended in 2013 and portfolio is liquidating.
Total	\$3,867	\$2,701		

Private Debt: European Corporate

Portfolio	Commitment (\$MM)	Market Value 3/31/2018	Target Net Return	IMD Commentary
ICG Arizona Senior Direct Lending Credit Fund	\$401	\$334	11%	Separate account that invests in floating-rate secured loans primarily to fund private-equity sponsored middle market leveraged transactions in Europe. The partnership can leverage ASRS's equity investment by up to 1.0x.
Ares European Credit Strategies Fund VII (Palo Verde), LP	\$350	\$144	11%	Fund-of-one partnership that invests primarily in floating-rate secured loans as well as second lien loans and mezzanine debt to fund middle market leveraged transactions in Europe. The partnership can leverage ASRS's equity investment by up to 1.0x.
Total	\$751	\$478		

Private Debt: Real Estate and Asset Backed

Portfolio	Commitment (\$MM)	Market Value 3/31/2018	Target Net Return	IMD Commentary
RFM Cactus Holding Company, LLC (Partnership with Related)	\$775	\$680	10%	Fund-of-one partnership that invests in: 1) "Freddie B" securities (first loss tranches of multi-family property securitizations that have been pooled and sponsored by Freddie Mac;) and 2) mezzanine debt to finance real estate properties.
H/2 Core Real Estate Debt Fund	\$400	\$377	6%	Open-ended fund that invests in floating-rate senior mortgage loans and other conservatively underwritten real estate finance investments. The fund will utilize leverage of up to 60%.
Sonoran Cactus Private Asset Backed Fund, LLC (Managed by Ares)	\$500	\$250	10%	Separate account that invests in loans backed by consumer and commercial receivables.
Total	\$1,675	\$1,267		

Private Debt: Aggregate Portfolio

Aggregated Portfolio

ASSET TYPE		
PORTFOLIO	ASRS COMMITMENT ¹	MARKET VALUE (MM) ²
U.S. Corporate	59%	\$2,734
Real Estate and Asset-Backed	28%	\$1,189
European Corporate	13%	\$278
TOTAL	100%	\$4,201

FUND TYPE		
STRATEGY	ASRS COMMITMENT ¹	MARKET VALUE (MM) ²
Separate Account	92%	\$3,730
Open-ended Fund	7%	\$428
Commingled	1%	\$43
TOTAL	100%	\$4,201

NOTE:

¹ % of ASRS Commitment represents the % of total commitment amounts.

² Market Values represent actual invested capital as of 9/30/17.

Private Debt: Aggregate Portfolio

Aggregated Portfolio

SECURITY TYPE		
SECURITY	% MV	MARKET VALUE (MM)
Senior Secured	72%	\$3,022
Freddie Mac B	10%	\$428
Mezzanine	7%	\$283
Structured	4%	\$168
Equity	4%	\$158
2nd Lien	2%	\$89
Other*	1%	\$39
Senior Unsecured	0%	\$14
TOTAL	100%	\$4,201

***Other:**

Common Stock, Preferred Equity, Other

SECURITY STATUS		
STATUS	% MV	MARKET VALUE (MM)
Performing	94%	\$3,951
Covenant Default	4%	\$162
Payment Default	1%	\$48
N/A*	1%	\$40
TOTAL	100%	\$4,201

***N/A Security Status:**

Common Stock, Preferred Equity

INTEREST RATE TYPE		
INTEREST RATE	% MV	MARKET VALUE (MM)
Floating Rate	87%	\$3,648
Fixed Rate	10%	\$ 418
N/A*	3%	\$ 135
TOTAL	100%	\$4,201

***N/A Interest Rate Type:**

Common Stock, Preferred Equity, Restructured Debt

Private Debt: Aggregate Portfolio

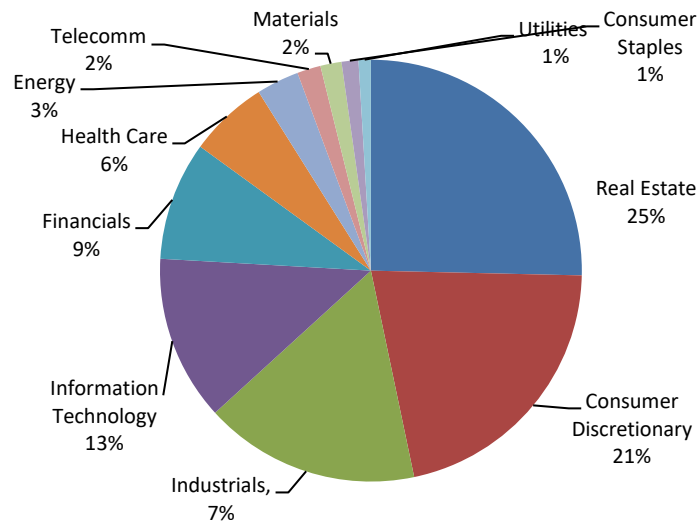
Aggregated Portfolio

LEVERAGED STRATEGIES	
MANAGER	DEBT TO EQUITY RATIO
H/2 Core Real Estate Debt Funds	1.44 : 1.00
Monroe Private Credit Fund A	1.00 : 1.00
Sonoran Private Credit Opp Fund (Managed by Cerberus)	1.00 : 1.00
ICG Arizona Senior Direct Lending Credit Fund	0.80 : 1.00
Cactus Direct Lending	0.71 : 1.00

Private Debt: Aggregate Portfolio

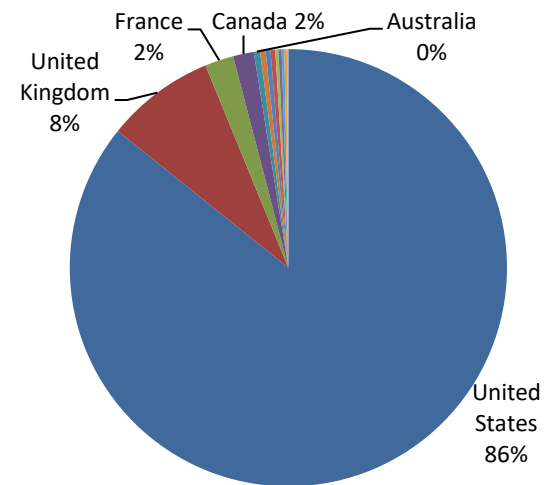
Aggregated Portfolio

**Sector Allocation
as % of Market Value**



TOP 5 SECTORS AS % OF MARKET VALUE		
SECTOR	% MV	MV (MM)
Real Estate	25%	\$1,065
Consumer Discretionary	21%	\$897
Industrials	17%	\$694
Information Technology	13%	\$532
Financials	9%	\$382
TOTAL	85%	\$3,570

**Country Allocation as
% of Market Value**



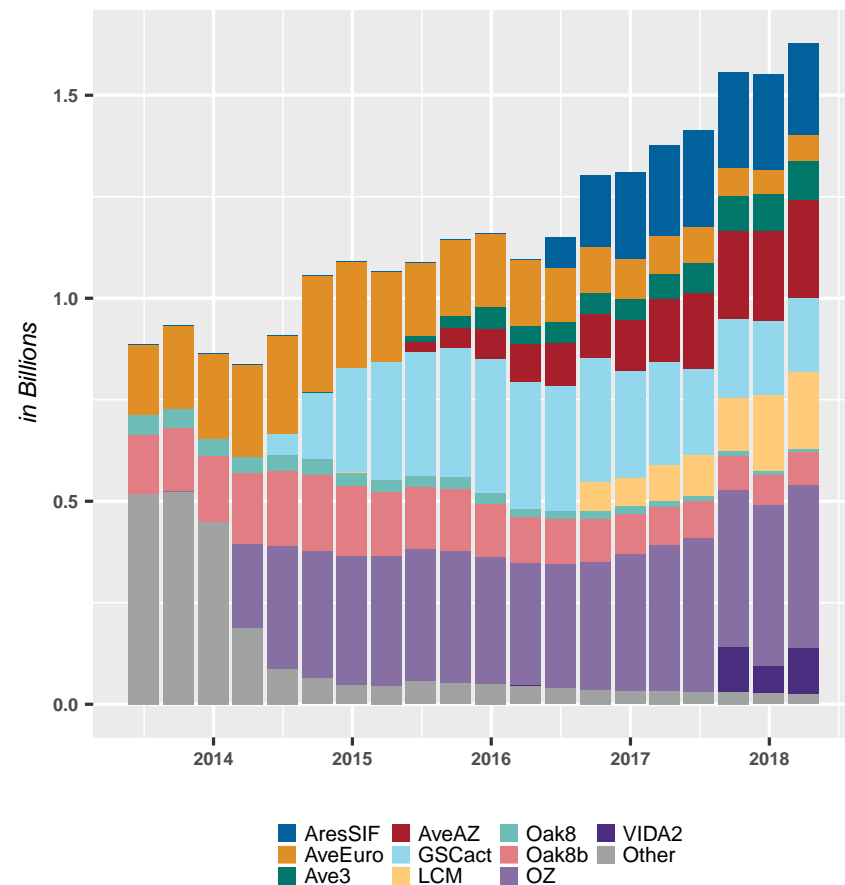
TOP 5 COUNTRIES AS % OF PORTFOLIO		
COUNTRY	% MV	MV (MM)
United States of America	86%	\$3,602
United Kingdom	8%	\$338
France	2%	\$89
Canada	2%	\$65
Australia	0%	\$19
TOTALS	98%	\$4,113

Opportunistic Debt

Opportunistic Debt IRRs

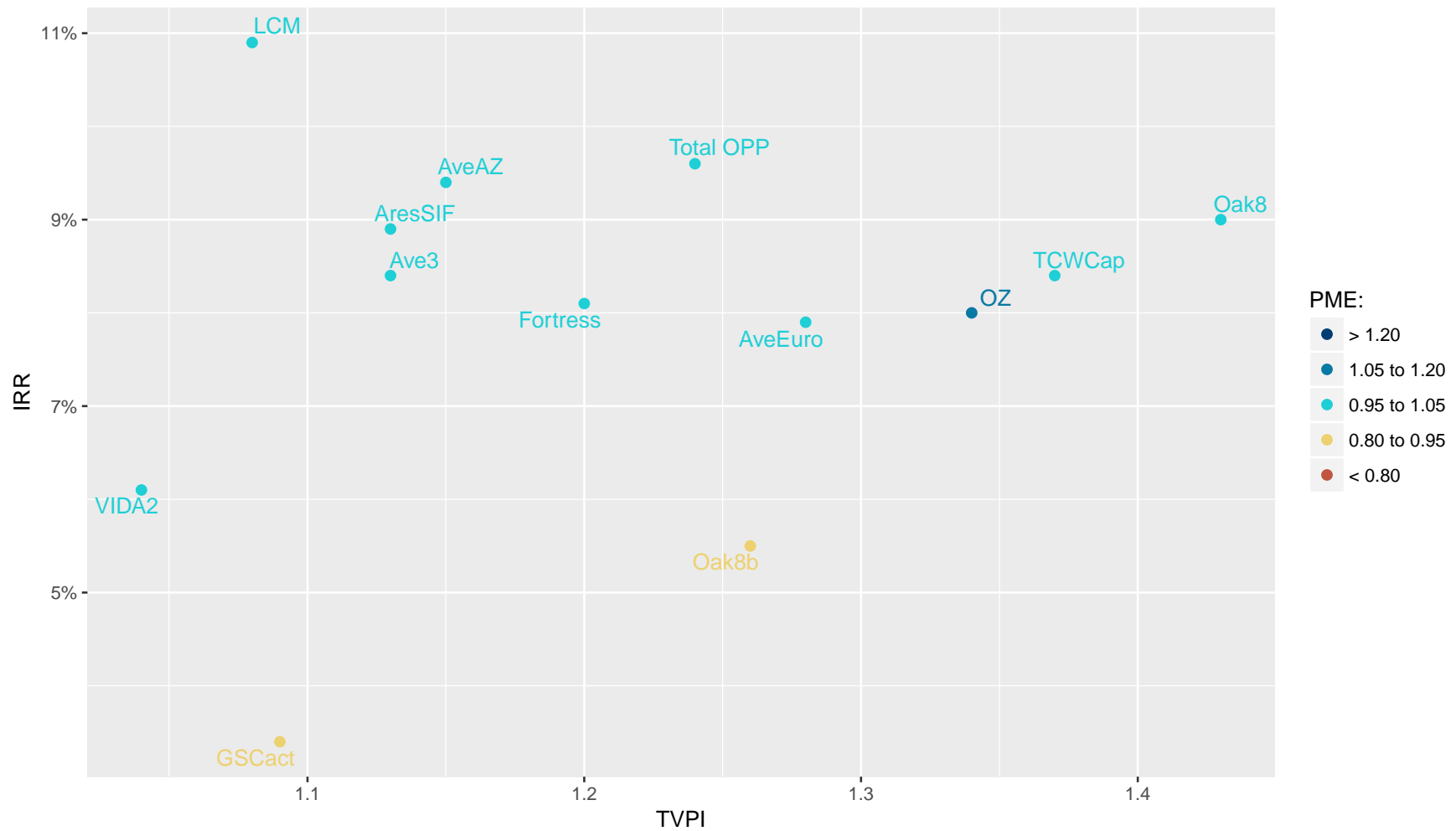
	QTR	1 YEAR	3 YEAR	ITD
Total.OPP	2.2	8.8	6.3	9.6
Benchmark	2.0	8.0	8.0	8.0
AresSIF	-3.2	2.1		8.9
AveEuro	3.5	8.3	7.2	7.9
Ave3	3.1	10.4		8.4
AveAZ	3.4	11.6		9.4
Oak8	4.2	24.8	0.9	9.0
Oak8b	6.2	20.7	2.1	5.5
Fortress	3.8	6.2	6.2	8.1
GSCact	3.2	0.1	2.7	3.4
LCM	3.0	12.4		10.9
OZ	1.9	11.9	8.0	8.0
TCWCap	1.7	20.5	8.4	8.4
VIDA2	4.7			6.1

Opportunistic Debt Market Values



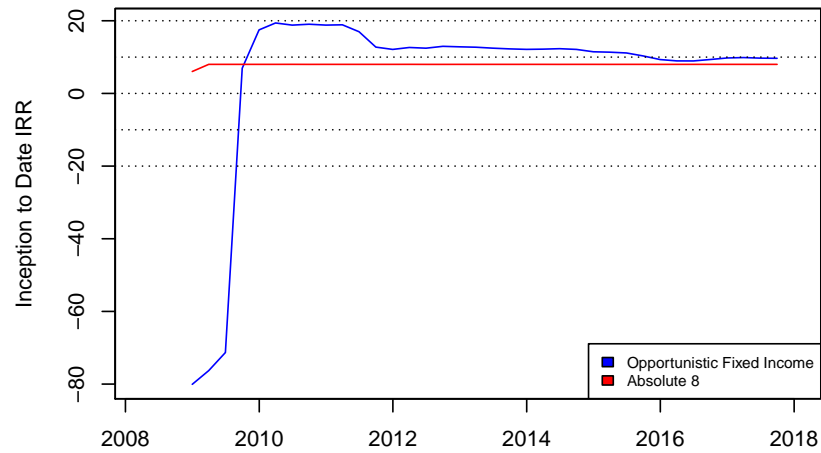
Opportunistic Debt: TVPI and PME

Comparison of Opportunistic Debt Strategies

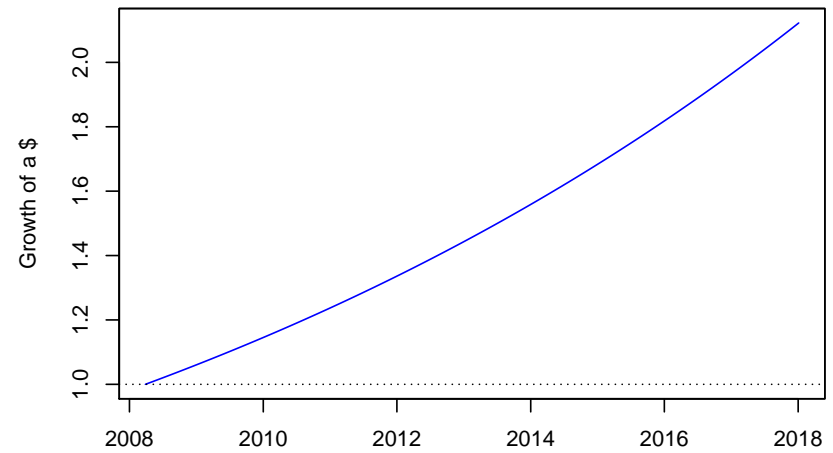


Opportunistic Debt Portfolio

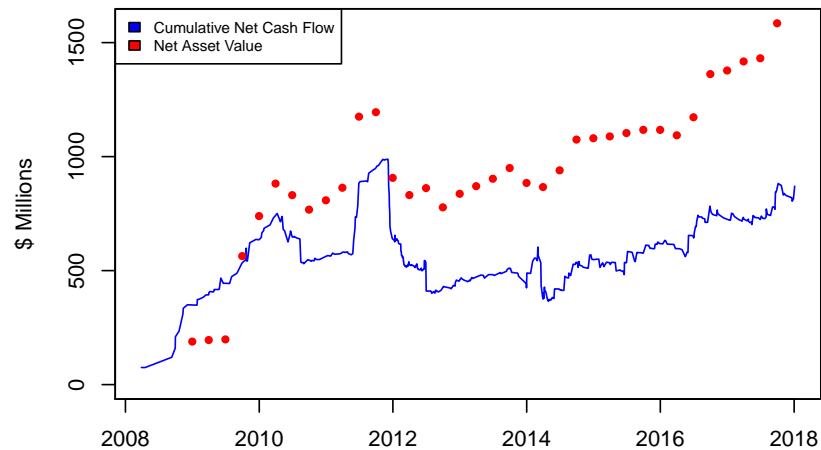
Opportunistic Fixed Income IRRs compared to Absolute 8%



Absolute 8



Opp. Fixed Income Cum. Net Capital Contributed Compared to Value



Opportunistic Fixed Income Quarterly Draws and Distributions



Opportunistic Debt: Funds Making New Investments

Portfolio	Commitment (\$MM)	Market Value 3/31/2018	Target Net Return	IMD Commentary
Avenue-ASRS Europe Opportunities Fund & Avenue Europe Capital Partners III	\$350	\$342	12%	\$250 million fund-of-one partnership with Avenue and \$100 million co-mingled fund commitment to invest in distressed debt of European companies.
LCM Partners CO IV LP	\$350	\$191	10%	Fund-of-one partnership with LCM Capital that invest in pools of small European loans, both non-performing and performing, sold by European banks and other financial institutions.
OZ Credit Opportunities Domestic Partners L.P.	\$300	\$403	12%	Co-mingled fund managed by Och-Ziff utilizes a multi-strategy approach to allocate to both distressed structured and corporate credit as it sees fit based on the opportunity.
Ares Saguaro Income Opportunity Fund	\$300	\$227	8%	Fund-of-one partnership with Ares that invests in publicly-traded, high-yielding business development companies ("BDCs") and commercial mortgage REITs.
Vida Insurance Credit Opportunity Fund II, LP	\$200	\$112	12%	Co-mingled fund managed by Vida Capital that invests in the life settlements market (unwanted life insurance policies).
Total	\$1,500	\$1,275		

Opportunistic Debt: Funds in Liquidation

Portfolio	Commitment (\$MM)	Market Value 2/1/2018	Target Net Return	IMD Commentary
GSO Cactus Credit Opportunities Fund	\$179	\$179	12%	Fund-of-one partnership with GSO to exploit the highest conviction, risk-adjusted corporate credit opportunities across the GSO platform including distressed debt in the US and Europe. Investment period ended in October 2016.
Avenue Europe Capital Partners II	\$60	\$60	15%	Fund invests in distressed debt of European companies. Investment period ended in 2014.
Oaktree Opportunities Fund VIIIb	\$80	\$80	15%	Funds invests in distressed debt primarily corporate such as leveraged loans. Investment period ended in 2014.
Fortress MSR Opportunities Fund II	\$23	\$23	12%	Fund invests in excess mortgage-servicing rights. Investment period ended in 2015.
Oaktree Opportunities Fund VIII	\$9	\$9	15%	Funds invests in distressed debt primarily corporate such as leveraged loans. Investment period ended in 2012.
TCW Capital Trust	\$3	\$3	10%	Fund invests in four asset classes: leveraged loans, high yield bonds, private debt and mezzanine debt. Investment period ended in 2013.
Total	\$355	\$355		

Opportunistic Debt: Aggregate Portfolio

Aggregated Portfolio

FUND TYPE		
STRATEGY	ASRS COMMITMENT ¹	MARKET VALUE (MV) ²
Separate Account	58%	\$ 793
Closed-End Fund	26%	\$ 397
Open-End Fund	16%	\$ 395
TOTAL	100%	\$ 1,585

FUND TYPE		
PORTFOLIO	ASRS COMMITMENT ¹	MARKET VALUE (MV) ²
New Investments	79%	\$ 1,187
In Liquidation	21%	\$ 398
TOTAL	100%	\$ 1,585

NOTE:

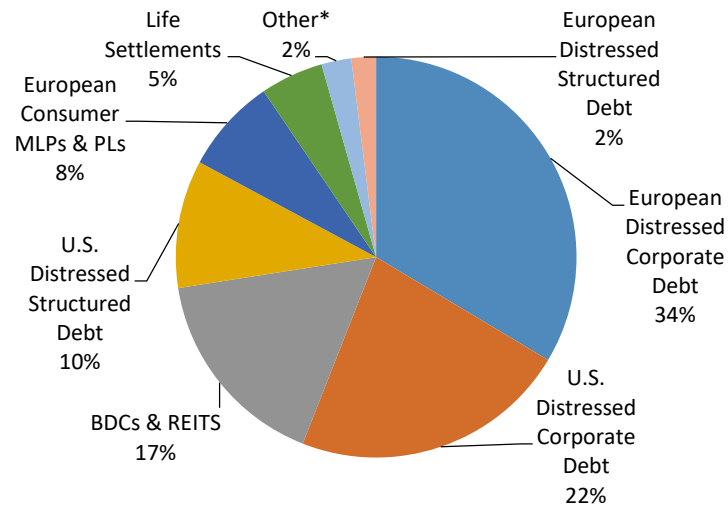
¹ % of ASRS Commitment represents the % of total commitment amounts.

² Market Values represent actual invested capital as of 9/30/17.

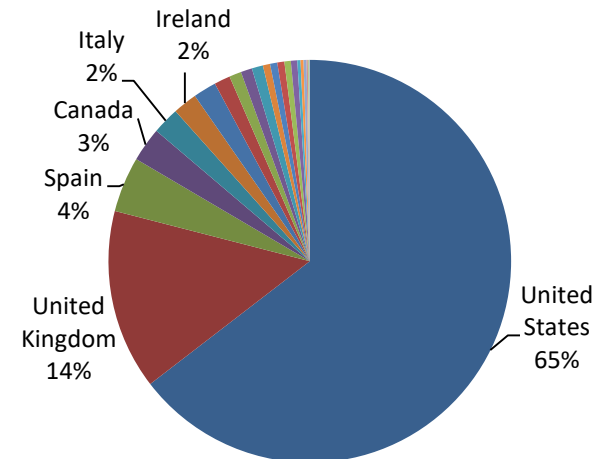
Opportunistic Debt: Aggregate Portfolio

Aggregated Portfolio

**Sector Allocation
as % of Market Value**



**Country Allocation as
% of Market Value**



**SECTORS
AS % OF MARKET VALUE**

SECTOR	% MV	MV (MM)
European Distressed Corporate Debt	34%	\$532
U.S. Distressed Corporate Debt	22%	\$355
BDCs & REITS	17%	\$262
U.S. Distressed Structured Debt	10%	\$164
European Consumer MLPs & PLs	8%	\$121
Life Settlements	5%	\$81
Other* (Mezzanine Debt, Mtg. Servicing Rights)	2%	\$38
European Distressed Structured Debt	2%	\$32
TOTALS	100%	\$1,585

**TOP 5 COUNTRIES
AS % OF MARKET VALUE**

COUNTRY	% MV	MV (MM)
United States of America	65%	\$1,023
United Kingdom	14%	\$229
Spain	4%	\$71
Canada	3%	\$44
Italy	2%	\$34
TOTALS	88%	\$1,401

Private Market Fund Names

Private Debt

ID	Name
Ares	Sonoran Cactus (Ares) Private Asset Backed Fund, L.P.
AresPalo	Ares European Credit Strategies Fund VII (Palo Verde), L.P.
BIGSO	Blackstone / GSO Capital Solutions Fund LP
Crbrs	Sonoran (Cerberus) Private Credit Opportunities LLC
H2Core	H/2 Core Real Estate Debt Fund L.P.
HghBr	Highbridge Principal Strategies and Mezzanine Partners II, L.P.
HghBr3	HPS-AP Mezzanine Partners III, L.P.
HighSSL	Highbridge Principal Strategies-Cactus Direct Lending Fund, L.P.
ICG	ICG Senior Debt Partners Fund
Monroe	Monroe Private Credit Fund A, L.P.
RFM	RFM Cactus Holding Company, LLC
WhtOak	White Oak Global Advisors Private Debt

Opportunistic Debt

ID	Name
AresSIF	Ares Saguaro Income Opportunity Fund, L.P.
Ave3	Avenue Europe Special Situations Fund III (U.S.), L.P.
AveAZ	Avenue-ASRS Europe Opportunities Fund L.P.
AveEuro	Avenue Europe Special Situations Fund II (U.S.), L.P.
Oak8	Oaktree Opportunities Fund VIII, L.P.
Oak8b	Oaktree Opportunities Fund VIIIb, L.P.
Fortress	Fortress MSR Opportunities Fund II A LP
GSCact	GSO Cactus Credit Opportunities Fund LP
LCM	LCM Partners CO IV LP
OZ	OZ Credit Opportunities Domestic Partners, L.P.
TCWCap	TCW Capital Trust
VIDA2	Vida Insurance Credit Opportunity Fund II, LP