

# **1Q2013 IAC Meeting Materials**

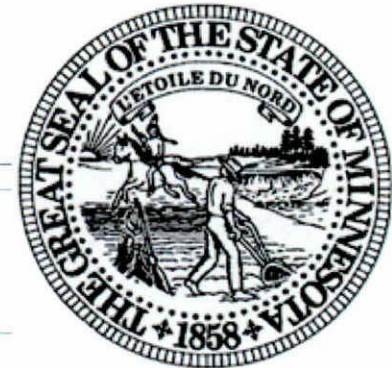
**IAC Meeting – May 16, 2013**

**Alternative Investment Presentation  
on Commitment Modeling**

# Alternative Investment Commitment Modeling

**Minnesota State Board of Investment**

**John Griebenow and J.J. Kirby**



# Agenda

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Review of Mechanics of Private Market Investments

Introduction to Commitment Modeling

Lessons Learned From 2009 Commitment Modeling Exercise

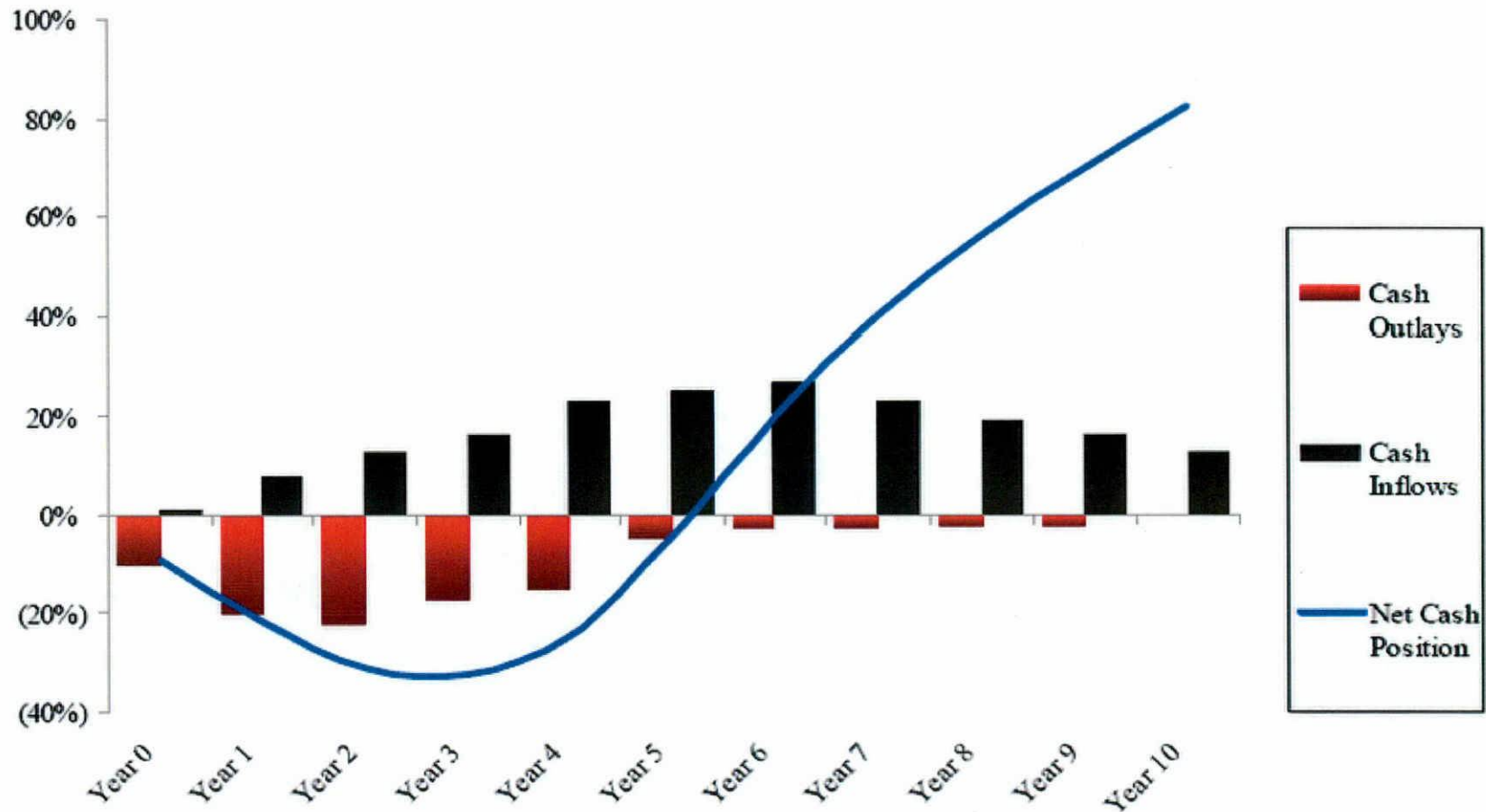
2013 Commitment Model: Identification of Variables and Assumptions

Results of Modeling Exercise

Conclusions and Recommendation

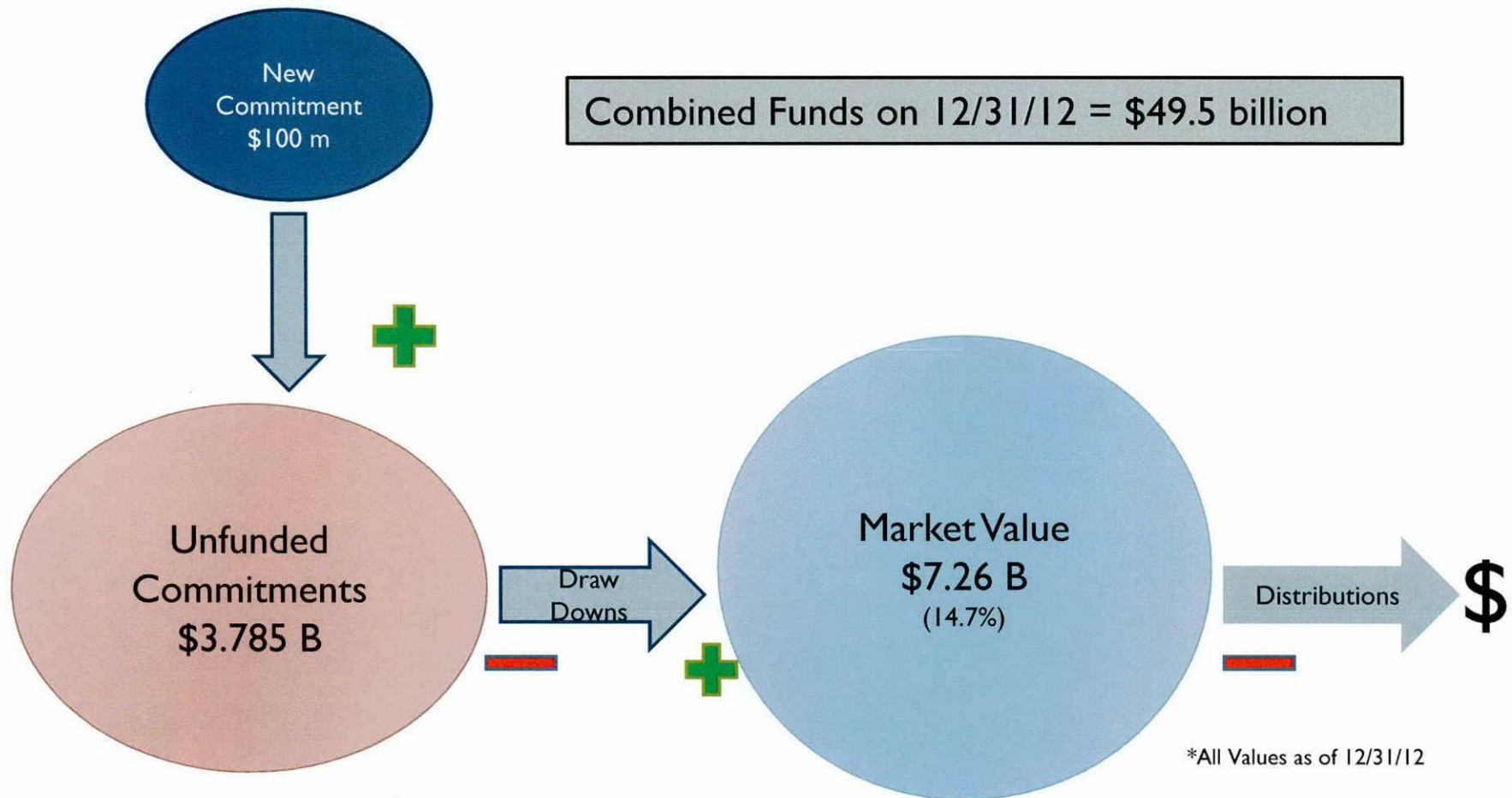
Appendix

# Overview: Mechanics of Private Investments





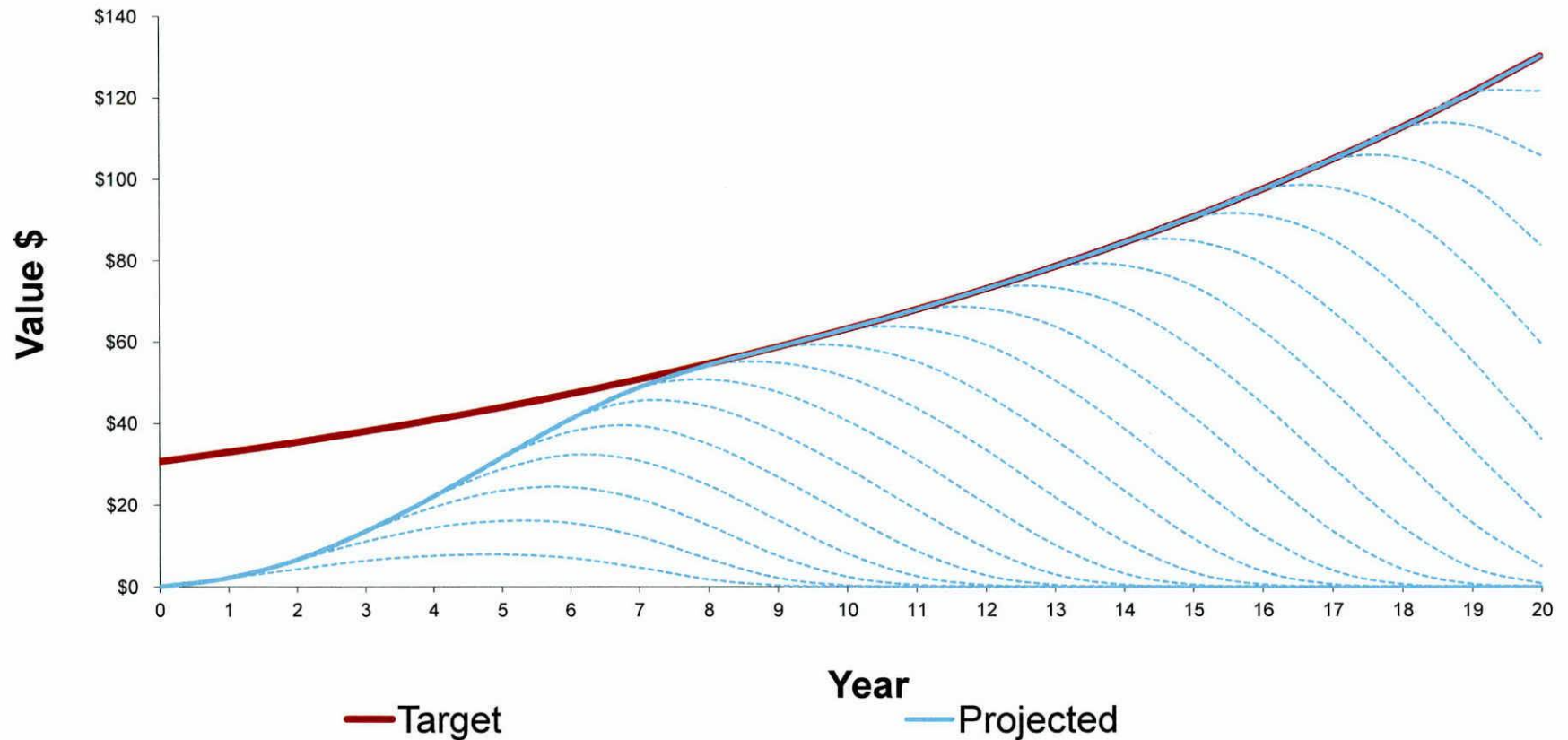
# Overview: Mechanics of Private Investments



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## Targeted vs. Projected



## What is Commitment Modeling? Why is it Necessary?

- ▶ An attempt to **estimate** the dollar amount necessary to commit to private investments each year in order to achieve a desired allocation to the asset class
- ▶ Alternative Investments are “depleting assets”, therefore dollars need to be committed to the asset class each period just to maintain allocation, let alone grow the allocation\*
  - ▶ \* = Denominator effect!
  - ▶  $MV \text{ of Alternatives} / \text{Total Combined Funds} = \text{Allocation \%}$
- ▶ The MSBI performs this exercise periodically in order to adjust its commitment levels, based on updated cash flow data and assumed rates of return, so as to achieve the desired allocation in 5 years



# Then and Now: What Did We Learn?

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- ▶ MSBI Staff performed a Commitment Modeling exercise in 2009 and recommended investing \$750 million - \$1.5 billion annually
  - ▶ This was based on assumed growth rates for the Combined Funds that were much lower than were realized during the 2009 – 2012 time period
    - ▶ The denominator in the allocation equation grew much faster than anticipated, making the 2009 investment pacing recommendation inadequate
      - Combined Funds actual return from June 2009 to December 2012: 13.3%
      - Combined Funds grew from \$36 billion to \$49 billion from June 2009 to December 2012
  - ▶ As a result, the invested allocation percentage to Alternatives has remained about the same since 2009 rather than growing
  
- ▶ **Bottom line: Commitment Modeling is a useful exercise to help guide investment pacing. Staff should revisit their assumptions every two years to take into account changing market conditions**



# 2013 Commitment Model: Identification of Variables and Assumptions

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## 1. Draw Down and Distribution Rates (J-Curve)

- Used MSBI's historical cash flow data to determine J-Curves for each sub-asset class as well as the program in aggregate – See Appendix B, C & D
- Also gathered data from external sources to compare to MSBI – See Appendix D
- Formulated a “Top Down” cash flow scenario in which drawdown rates are even for 5 years, then distribution rates pick up over remaining 7 years of partnership's life – See Appendix B, C & D

## 2. Alternative Investment Rates of Return

- Taken from MSBI's 2011 Asset Allocation Study as well as policy stated assumed rates of return for sub-asset classes within alternatives – See Appendix A

## 3. Rest of Combined Funds Rates of Return

- Taken from MSBI's 2011 Asset Allocation Study – See Appendix A

## 4. Net Cash Outflow to Pensioners

- Data gathered from the TRA, MSRS and PERA
- Net Cash Outflows start at \$1.9 Billion and are grown at -\$100 million per year

## 5. Commitment Size and Timing

# **Commitment Model: Model Description**

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- ❑ **Models the growth of the Combined Funds, projected new fund commitments, and the SBI's existing partnerships according to the expected rates of returns (Appendix A)**
  - ❑ **For new fund commitments, expected returns based on 2011 Asset Allocation study**
  - ❑ **For existing partnerships, policy stated expected rates of returns are used**
- ❑ **Assumes two cash flow scenarios (Appendix B, C & D):**
  - Historical SBI cash flow scenario
    - Average draw down and distribution rates from past and present MSBI partnerships
  - Top Down cash flow scenario
    - 5 year investment period and 7 year distribution period, with approximately 3% yield on funded commitments
- ❑ **Model solves for annual commitment level needed to achieve desired alternative investment market value in 5 years.**

# Commitment Model Outputs

## MSBI Commitment Model

	RESTRICTION: 30% Target Allocation for Market Value + Unfunded		GOAL: 20% Target Allocation for Market Value				
<b>CASH FLOW SCENARIO 1</b> (MSBI historical cash flows)	ANNUAL COMMITMENT SIZE (in Billions)	MV %	MV + UNFUNDED %	ANNUAL COMMITMENT SIZE (in Billions)	MV %	MV + UNFUNDED %	
	BASE CASE 8.36% Growth	\$2.53	14.8%	30.0%	\$4.67	20.0%	44.9%
	BASE CASE + 10% 18.36% Growth for 2 yr, then Base	\$3.35	14.1%	30.0%	\$6.33	20.0%	46.8%
	BASE CASE - 10% -1.64% Growth for 2 yr, then Base	\$1.79	15.8%	30.0%	\$3.16	20.0%	42.2%
<b>CASH FLOW SCENARIO 2</b> (Top down / 5 year draw cash flows)	ANNUAL COMMITMENT SIZE (in Billions)	MV %	MV + UNFUNDED %	ANNUAL COMMITMENT SIZE (in Billions)	MV %	MV + UNFUNDED %	
	BASE CASE 8.36% Growth	\$2.19	17.1%	30.0%	\$3.20	20.0%	37.5%
	BASE CASE + 10% 18.36% Growth for 2 yr, then Base	\$2.96	16.2%	30.0%	\$4.56	20.0%	39.5%
	BASE CASE - 10% -1.64% Growth for 2 yr, then Base	\$1.48	18.2%	30.0%	\$1.96	20.0%	34.6%



# **Conclusions / Recommendations**

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## **▶ CONCLUSIONS**

1. It is difficult to predict commitment sizes precisely given our model's sensitivity to its variables
2. Maintaining targets for both MV and MV + Unfunded Commitments continues to be a valuable way to help control our risk
3. However, based on the various assumptions presented, the allocation to Alternatives cannot reach the 20% goal with the 30% MV + Unfunded restriction in place

## **▶ RECOMMENDATIONS**

1. Based on current constraints, commit up to \$2.5 Billion annually, which will likely involve individual fund commitment sizes of \$100 - \$300 million
2. At the August IAC meeting, staff will present recommendations regarding our 20% target allocation and 30% MV + Unfunded Commitment rule
3. Review commitment modeling every 24 months



# Questions?

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## Appendix A: Growth Rate Assumptions

<b>2011 Asset Allocation Study</b>			
Combined Funds			
	Policy Targets*	Expected Return*	
<b>Equity</b>	<b>60%</b>	<b>8.63%</b>	
Domestic Equity	45%		8.50%
International Unhedged	15%		9.00%
<b>New Alternative Investments</b>	<b>20%</b>	<b>9.40%</b>	
<b>Fixed Income</b>	<b>20%</b>	<b>4.36%</b>	
Domestic Bonds	18%		4.45%
Cash Equivalents	2%		3.50%
<hr/>			
<b>Total Combined Funds**</b>	<b>100%</b>	<b>8.36%</b>	
<hr/>			
<b>Existing Alternative Investments</b>	<b>14.7% as of 12/31/2012</b>		
		Private Equity	13.00%
Expected Returns for:		Real Assets	8.00%
		Yield Oriented	8.50%

\* Nominal Expected Returns & Policy Targets Taken From 2011 MSBI Combined Funds Asset Allocation Study (assumes 3% inflation)

\*\*The attribution of the asset class weighted returns does not sum to the Total Combined Funds return because the asset class returns are 10-year geometric returns

## Appendix B: SBI Commitment Model Cash Flow Scenarios: Draw Down & Distribution %'s

### CASH FLOW SCENARIO 1

(MSBI historical cash flows)

Equity Resource			Equity Real Estate			Equity Private Equity			Debt Resource			Debt Real Estate			Debt Private Equity			Future Commitments (Asset-Class Weighted)		
Year	Ave Inflow	Ave Outflow	Year	Ave Inflow	Ave Outflow	Year	Ave Inflow	Ave Outflow	Year	Ave Inflow	Ave Outflow	Year	Ave Inflow	Ave Outflow	Year	Ave Inflow	Ave Outflow	Year	Ave Inflow	Ave Outflow
1	1%	-12%	1	2%	-30%	1	1%	-20%	1	0%	-19%	1	1%	-18%	1	2%	-14%	1	1.29%	-19.27%
2	3%	-19%	2	6%	-23%	2	4%	-23%	2	4%	-16%	2	6%	-21%	2	5%	-22%	2	4.28%	-22.27%
3	9%	-24%	3	6%	-20%	3	7%	-20%	3	3%	-18%	3	19%	-15%	3	10%	-17%	3	7.62%	-20.11%
4	13%	-19%	4	6%	-7%	4	12%	-13%	4	5%	-12%	4	17%	0%	4	18%	-14%	4	12.66%	-13.21%
5	22%	-8%	5	9%	-4%	5	16%	-9%	5	20%	-13%	5	10%	-1%	5	19%	-10%	5	16.38%	-8.34%
6	28%	-6%	6	8%	-2%	6	22%	-6%	6	7%	-13%	6	9%	0%	6	15%	-9%	6	19.90%	-5.92%
7	18%	-4%	7	11%	0%	7	27%	-3%	7	20%	0%	7	12%	0%	7	20%	-4%	7	22.47%	-2.89%
8	25%	0%	8	12%	0%	8	27%	-2%	8	35%	0%	8	17%	0%	8	20%	-1%	8	23.61%	-1.29%
9	25%	0%	9	18%	0%	9	18%	-1%	9	35%	0%	9	16%	0%	9	9%	-1%	9	17.62%	-0.72%
10	43%	0%	10	18%	0%	10	22%	0%	10	46%	0%	10	14%	0%	10	5%	0%	10	21.86%	0.00%
11	45%	0%	11	21%	-4%	11	15%	0%	11	62%	0%	11	17%	-9%	11	8%	0%	11	19.05%	-0.54%
12	25%	0%	12	14%	0%	12	24%	0%	12	36%	0%	12	14%	0%	12	4%	0%	12	19.71%	0.00%

### CASH FLOW SCENARIO 2

(Top down / 5 year draw cash flows)

Equity Resource			Equity Real Estate			Equity Private Equity			Debt Resource			Debt Real Estate			Debt Private Equity			Future Commitments		
Year	Distributions	Draws	Year	Distributions	Draws	Year	Distributions	Draws	Year	Distributions	Draws	Year	Distributions	Draws	Year	Distributions	Draws	Year	Distributions	Draws
1	0%	-20%	1	0%	-20%	1	0%	-20%	1	0%	-20%	1	0%	-20%	1	0%	-20%	1	0%	-20%
2	1%	-20%	2	1%	-20%	2	0%	-20%	2	1%	-20%	2	1%	-20%	2	1%	-20%	2	1%	-20%
3	2%	-20%	3	2%	-20%	3	1%	-20%	3	2%	-20%	3	2%	-20%	3	2%	-20%	3	1%	-20%
4	2%	-20%	4	2%	-20%	4	1%	-20%	4	3%	-20%	4	2%	-20%	4	3%	-20%	4	2%	-20%
5	3%	-20%	5	3%	-20%	5	2%	-20%	5	4%	-20%	5	3%	-20%	5	4%	-20%	5	2%	-20%
6	4%	0%	6	4%	0%	6	2%	0%	6	25%	0%	6	4%	0%	6	25%	0%	6	3%	0%
7	25%	0%	7	25%	0%	7	34%	0%	7	29%	0%	7	25%	0%	7	29%	0%	7	3%	0%
8	29%	0%	8	29%	0%	8	40%	0%	8	35%	0%	8	29%	0%	8	35%	0%	8	33%	0%
9	35%	0%	9	35%	0%	9	50%	0%	9	29%	0%	9	35%	0%	9	29%	0%	9	39%	0%
10	29%	0%	10	29%	0%	10	40%	0%	10	25%	0%	10	29%	0%	10	25%	0%	10	48%	0%
11	25%	0%	11	25%	0%	11	34%	0%	11	0%	0%	11	25%	0%	11	0%	0%	11	39%	0%
12	0%	0%	12	0%	0%	12	0%	0%	12	0%	0%	12	0%	0%	12	0%	0%	12	33%	0%



## Appendix C: SBI Commitment Model Cash Flow Scenarios: Net Cash Flows

### CASH FLOW SCENARIO 1

(MSBI historical cash flows)

Equity Resource		Equity Real Estate		Equity Private Equity		Debt Resource		Debt Real Estate		Debt Private Equity		Future Commitments (Asset Class Weighted)	
Year	Net Cash Flows	Year	Net Cash Flows	Year	Net Cash Flows	Year	Net Cash Flows	Year	Net Cash Flows	Year	Net Cash Flows	Year	Net Cash Flows
1	-11%	1	-28%	1	-19%	1	-19%	1	-17%	1	-12%	1	-18%
2	-16%	2	-17%	2	-19%	2	-12%	2	-15%	2	-17%	2	-18%
3	-15%	3	-14%	3	-13%	3	-15%	3	4%	3	-7%	3	-12%
4	-6%	4	-1%	4	-1%	4	-7%	4	17%	4	4%	4	-1%
5	14%	5	5%	5	7%	5	7%	5	9%	5	9%	5	8%
6	22%	6	6%	6	16%	6	-6%	6	9%	6	6%	6	14%
7	14%	7	11%	7	24%	7	20%	7	12%	7	16%	7	20%
8	25%	8	12%	8	25%	8	35%	8	17%	8	19%	8	22%
9	25%	9	18%	9	17%	9	35%	9	16%	9	8%	9	17%
10	43%	10	18%	10	22%	10	46%	10	14%	10	5%	10	22%
11	45%	11	17%	11	15%	11	62%	11	8%	11	8%	11	19%
12	25%	12	14%	12	24%	12	36%	12	14%	12	4%	12	20%

### CASH FLOW SCENARIO 2

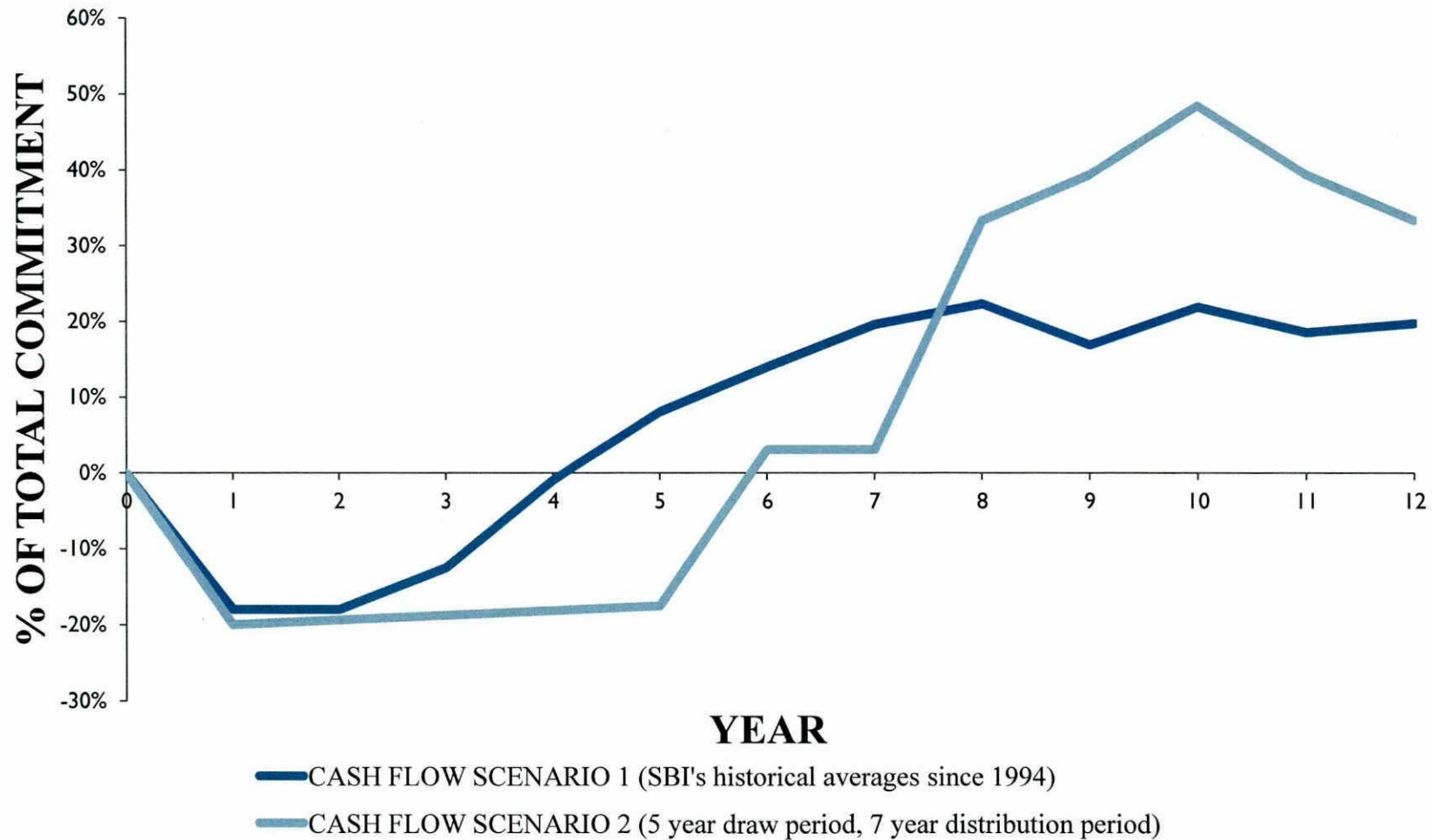
(Top down / 5 year draw cash flows)

Equity Resource		Equity Real Estate		Equity Private Equity		Debt Resource		Debt Real Estate		Debt Private Equity		Future Commitments	
Year	Net Cash Flows	Year	Net Cash Flows	Year	Net Cash Flows	Year	Net Cash Flows	Year	Net Cash Flows	Year	Net Cash Flows	Year	Net Cash Flows
1	-20%	1	-20%	1	-20%	1	-20%	1	-20%	1	-20%	1	-20%
2	-19%	2	-19%	2	-20%	2	-19%	2	-19%	2	-19%	2	-19%
3	-18%	3	-18%	3	-19%	3	-18%	3	-18%	3	-18%	3	-19%
4	-18%	4	-18%	4	-19%	4	-17%	4	-18%	4	-17%	4	-18%
5	-17%	5	-17%	5	-18%	5	-16%	5	-17%	5	-16%	5	-18%
6	4%	6	4%	6	2%	6	25%	6	4%	6	25%	6	3%
7	25%	7	25%	7	34%	7	29%	7	25%	7	29%	7	3%
8	29%	8	29%	8	40%	8	35%	8	29%	8	35%	8	33%
9	35%	9	35%	9	50%	9	29%	9	35%	9	29%	9	39%
10	29%	10	29%	10	40%	10	25%	10	29%	10	25%	10	48%
11	25%	11	25%	11	34%	11	0%	11	25%	11	0%	11	39%
12	0%	12	0%	12	0%	12	0%	12	0%	12	0%	12	33%

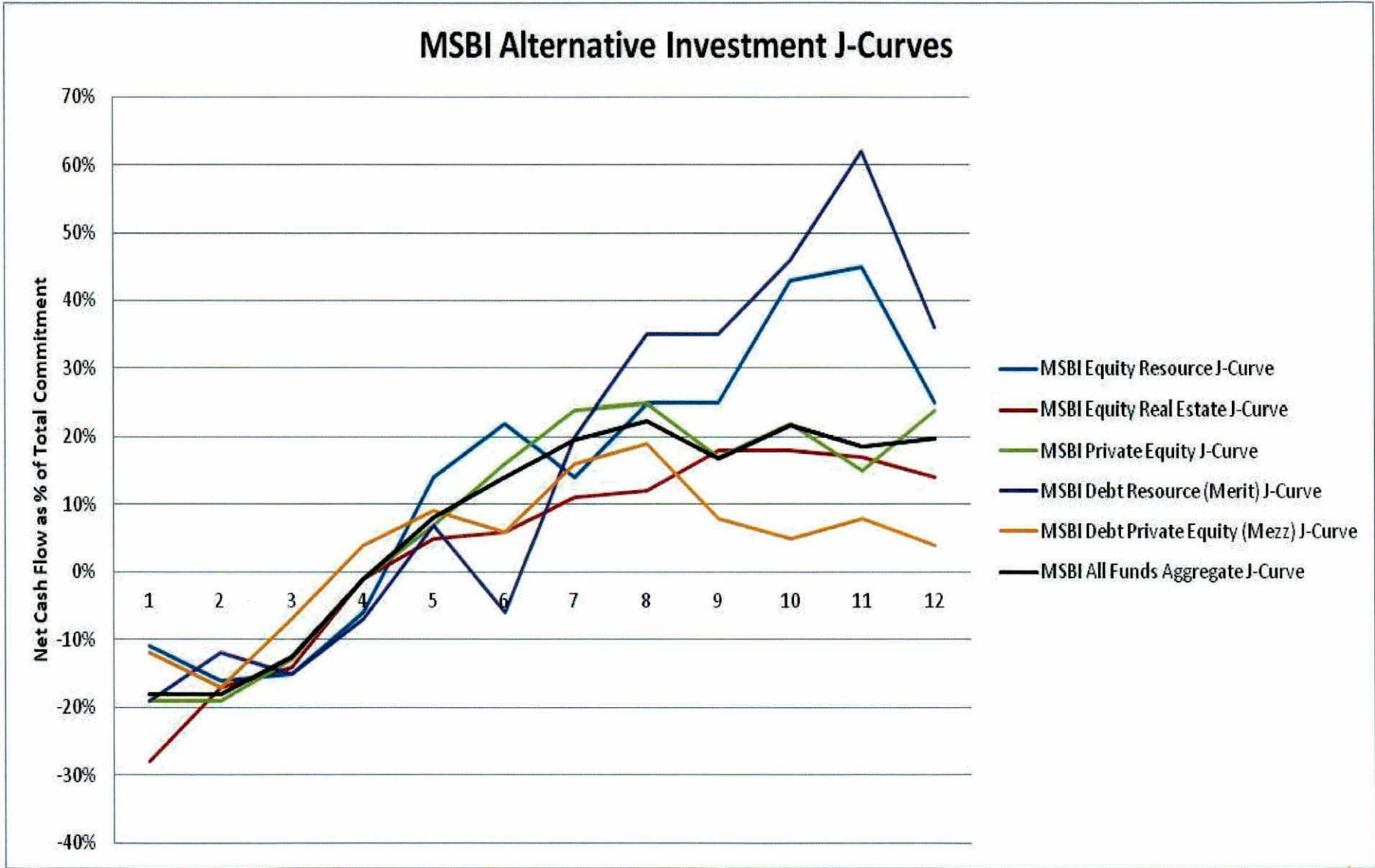


## Appendix D: J-Curves Used in Commitment Model

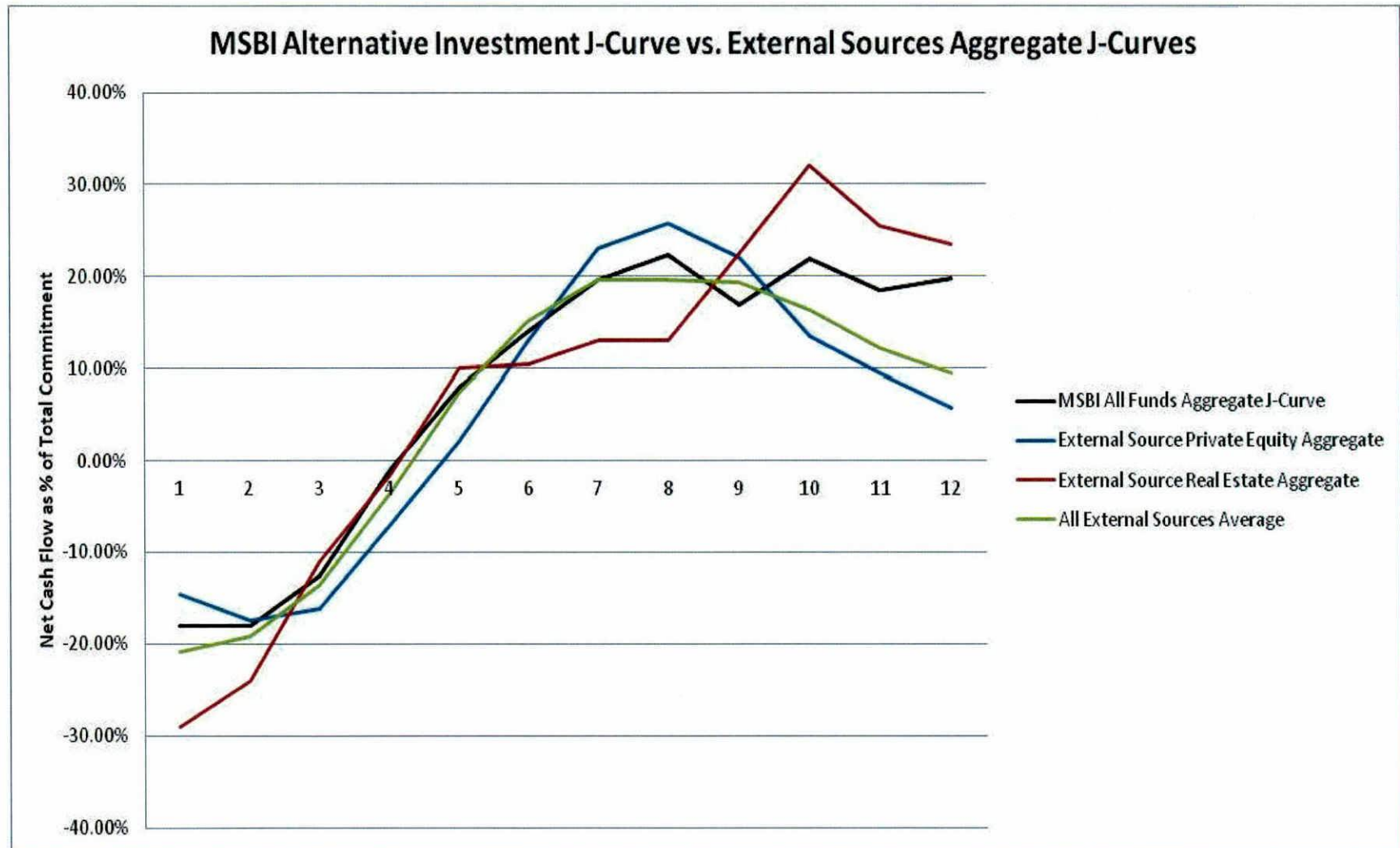
### NET CASH FLOWS



# Appendix D: MSBI J-Curves



## Appendix D: Comparative J-Curves



## Appendix E: External Data Sources:

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- ▶ Callan Associates
- ▶ Goldman Sachs
- ▶ Adams Street Partners
- ▶ Lexington Partners
- ▶ Credit Suisse Strategic Partners
- ▶ Pension Consulting Alliance