

IN THE SUPREME COURT OF OHIO

**THE STATE OF OHIO, ex rel.
EDWARD SIEDLE**

*

CASE NO.

*

RELATOR

Original Action in Mandamus

*

-vs-

*

**STATE TEACHERS' RETIREMENT
SYSTEM OF OHIO, et al.**

*

*

RESPONDENTS

AFFIDAVIT

State of Florida

County of Palm Beach SS:

I, Edward Siedle, being first duly cautioned and sworn, hereby depose and say as follows:

1. I am over the age of 18 years and am competent to testify to the matters set forth herein on personal knowledge.

2. I am the President of Benchmark Financial Services, Inc. and have held that position for over twenty years. I am a licensed attorney and have been involved in financial services, specifically institutional investing, my entire career. My company performs forensic investigations of pension funds.

3. Benchmark Financial Services, Inc. has been retained by the Ohio Retired Teachers Association to perform a forensic investigation of the STRS pension.

4. As part of that investigation, on February 19, 2021, my attorney, Marc E. Dann, sent to the State Teachers Retirements System of Ohio ("STRS") a request for public records, including a specific request for the following records relating to CEM Benchmarking:

1. Please provide all contracts between STRS and CEM Benchmarking.
2. Please provide all reports and analysis produced by CEM Benchmarking related to STRS's investment management fees, costs and expenses.
3. Please provide all reports and analysis produced by CEM Benchmarking related to alternative investments.

A copy of Mr. Dann's letter is attached as Exhibit 1.

5. In response, STRS provided annual reports it prepared for STRS for the years 2015-2019. Copies of those reports, as produced by STRS, are attached as Exhibits 2-6 respectively.

6. Exhibits 2-6 contains extensive redactions of data relating to the performance of STRS's investments, including the fees charged by outside managers.

7. Accompanying Exhibits 2-6, STRS provided the following explanation for the redactions:

CEM Benchmarking's explanation of their redactions is:

"The redactions have been made in line with the definition of "Trade secret" as defined in Ohio Code 1333.61 Uniform trade secrets act definitions as follows:

(D) "Trade secret" means information, including the whole or any portion or phase of any scientific or technical information, design, process, procedure, formula, pattern, compilation, program, device, method, technique, or improvement, or any business information or plans, financial information, or listing of names, addresses, or telephone numbers, that satisfies both of the following:

(1) It derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use.

(2) It is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

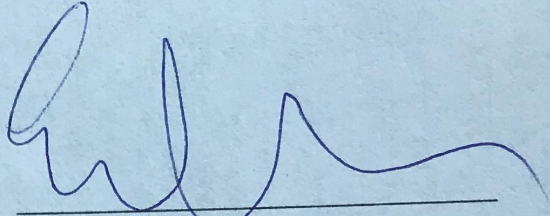
We have redacted our cost data as well as certain formulas and methods used in the preparation of the report. The information that has been redacted is not publicly available and is only provided to our paying clients. The redacted cost data has been provided to us by our clients and forms our proprietary cost database. This data and database is not available from other public sources and forms the basis for our analysis. It is key to our business model that the data not be publicly released. Note that I have not redacted return information since 1) much of this data could be gleaned from publicly available sources (CAFRs) and is not core to our product."

8. Over the years of performing reviews of pension funds, and in particular public pension funds, I recognize this type of response to a request for documents relating to fund performance.

9. Based on my years of experience, I know that much of the information that has been redacted is in no way a "trade secret." In fact, much of the data that CEM redacted from the reports belongs exclusively to STRS and relates solely to its performance. I also know that some of the redacted information is publicly available elsewhere (although the documents themselves may not be publicly available). Finally, some of the information redacted – namely the identities of the public pension funds which CEM categorizes as being in STRS's "peer group" for comparison purposes – is not claimed by CEM on its website to be confidential or a trade secret.

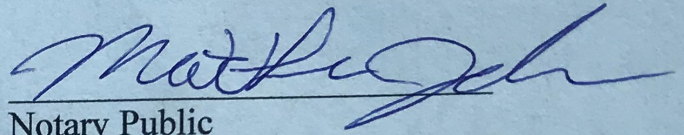
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Further, affiant sayeth naught.

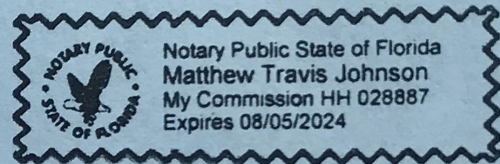


Edward Siedle

Sworn to and subscribed before me this 20th day of May 2021, by Edward Siedle, whose identity has been proven to me.



Notary Public





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February 19, 2020

William Neville
State Teacher Retirement System of Ohio
275 E. Broad St.
Columbus, OH 43215-3771

**RE: PUBLIC RECORDS REQUEST PURSUANT TO OHIO REVISED
CODE § 149.43, *et seq.* On Behalf of Edward Seidle**

Dear Mr Neville:

Under the Ohio Open Records Law, Ohio Revised Code § 149.43, *et seq.* **On behalf of Edward Seidle we request an opportunity to inspect or obtain copies of public records as described below:**

Please provide the following documents and information in electronic format for the past 6 years:

Documents Regarding Investment Managers:

1. All contracts, including any private placement memoranda, offering documents and subscription agreements, between STRS and its investment managers.
2. All Requests for Proposal (“RFPs”) or other documents related to competitive bidding issued by STRS for hiring investment managers or investment funds.
3. All documents submitted to STRS in response to RFPs or other competitive bidding efforts by investment funds and investment fund managers.
4. Please provide all documents demonstrating that investment managers in the employ of STRS are GIPS compliant.
5. Please provide all valuations performed or submitted to STRS by any investment fund or investment fund manager.



6. Please provide copies of all independent third party valuations of hard-to-value assets in the possession of STRS.
7. Please provide copies of all evaluations of the value of asset provided by investment funds or investment fund managers engaged by STRS
8. Please provide all documents related to STRS investments in limited partnerships.
9. Please provide all documents related to STRS investments in Funds of Funds including but not limited to documents related to the underlying managers of each such fund.

Documents relating to Callan:

1. Please provide all contracts between the STRS and Callan Associates.
2. Please provide any documents relating to potential conflicts of interest at Callan.
3. Please provide any documents prepared or received as part of STRS's due diligence documents regarding litigation, regulatory or disciplinary matters involving Callan.
4. Please provide all documents related to compensation arrangements by Callan with the STRS investment managers.
5. Please provide documentation related to any review by the STRS Board of potential conflicts of interest at Callan.
6. Please provide any disclosure(s) providing the actual dollar amounts of compensation received by Callan from each of the STRS investment managers.
7. Please provide all asset allocation reports, investment manager recommendations, investment performance and other reports related to STRS produced by Callan.

Documents relating to ACA Compliance :

1. Please provide all Contracts between STRS and ACA Compliance.
2. Please provide any documents regarding potential conflicts of interest at ACA.
3. Please provide any due diligence documents regarding litigation, regulatory or disciplinary matters involving ACA.
4. Please provide any disclosure by ACA of compensation arrangements with STRS investment managers.



5. Please provide documents related to any review by the STRS Board conflicts of interest at ACA.
6. Please provide any disclosure providing the actual dollar amounts of compensation received by ACA from STRS investment managers.
7. Please provide all reports related to STRS GIPS compliance and investment performance produced by ACA.

Documents relating to Cliffwater

1. Please provide all contracts between STRS and Cliffwater.
2. Please provide any documents regarding potential conflicts of interest at Cliffwater.
3. Please provide any due diligence documents regarding litigation, regulatory or disciplinary matters involving Cliffwater.
4. Please provide any disclosure by Cliffwater of compensation arrangements with the fund's investment managers.
5. Please provide documents related to any review by the STRS Board of conflicts of interest at Cliffwater.
6. Please provide all asset allocation reports, investment manager recommendations, investment performance and other reports related to STRS produced by Cliffwater.
7. Please provide any disclosure requesting or providing the actual dollar amounts of compensation received by Cliffwater from the pension's investment managers.

Documents relating to CEM Benchmarking:

1. Please provide all contracts between STRS and CEM Benchmarking.
2. Please provide all reports and analysis produced by CEM Benchmarking related to STRS's investment management fees, costs and expenses.
3. Please provide all reports and analysis produced by CEM Benchmarking related to alternative investments.

Documents Relating to Auditors and Custodians:

1. Please provide all contracts between STRS and CliftonLarsonAllen.
2. Please provide all contracts between STRS and its custodian banks.
3. Please provide all documents relating to third party valuations of hard to value assets conducted by custodians contracted with STRS.



4. Please provide all documents related to investments not custodied at STRS's custodians and indicate where such assets are held.
5. Please provide all documents related to the efforts STRS custodians make to verify the existence of all STRS assets held everywhere?
6. Please provide documents related any STRS assets deemed "worthless" by any custodian.

Documents Relating to Board and Staff:

1. Please provide copies of the current fiduciary liability policies of the board and STRS.
2. Please provide documents related to any and all board seats that STRS holds on investment partnerships.
3. Please provide all documents related travel expenses related to attendance by STRS staff at investment partnership meetings.
4. Please provide documents related to all expenses related to staff and board member travel to non-U.S. locations.
5. Please provide the minutes of any meetings of the board.
6. Please provide the STRS Investment Policy Statement.

If there are any fees for searching or copying these records, please inform me if the cost will exceed \$25.00. I would request that these records be copied and mailed to me or copied and allow me to pick them up from the STRS office.

If you expect a significant delay in responding to or in fulfilling this request, please contact me with information about when I might expect copies or the ability to inspect the requested records.

If you deny any or all of this request, please cite each specific exemption you feel justifies the refusal to release the information and notify me of the appeal procedures available to me under the law.

Thank you for considering our request.

Sincerely,

Marc Dann
DannLaw
mdann@dannlaw.com



**Dann
Law**

Investment
Cost Effectiveness Analysis
(for the 5 years ending December 31, 2015)

STRS Ohio

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Key takeaways

Returns

- Your 5-year net total return of 8.3% was in the top quartile of our U.S. Public universe. This compares to the U.S. Public median of 7.2% and the peer median of 7.5%.
- Your 5-year policy return was 8.4%. This was above the U.S. Public median of 7.2% and above the peer median of 7.3%.

Value added

- Your 5-year net value added was -0.1%. This was close to the U.S. Public median of 0.0% and close to the peer median of 0.0%.

Cost

- Your investment cost for benchmarking purposes of 38.0 bps was below your benchmark cost of 44.9 bps. This suggests that your fund was low cost compared to your peers.
- Thank you for endorsing the ILPA reporting template. We're hopeful that widespread adoption of the template will result in better benchmarking of private equity costs.

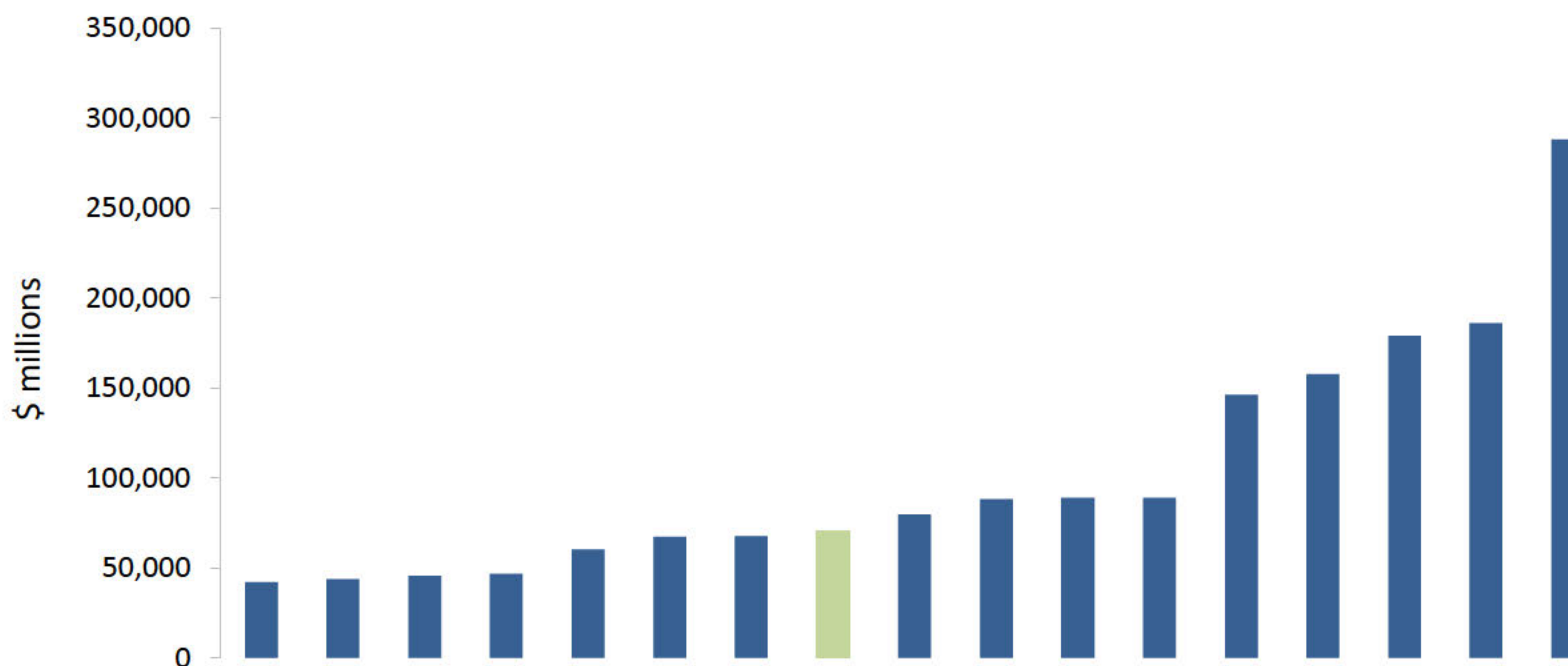
Risk

- Your asset risk of 10.6% was above the U.S. Public median of 10.0% and the peer median of 10.2%. Your tracking error of 0.6% was below the U.S. Public median of 1.1% and the peer median of 0.8%.

The most valuable comparisons for cost performance are to your custom peer group because size impacts costs.

Peer group for STRS Ohio

- 17 U.S. public sponsors from \$42 billion to \$288 billion
- Median size of \$80 billion versus your \$71 billion



To preserve client confidentiality, given potential access to documents as permitted by the Freedom of Information Act, we do not disclose your peers' names in this document.

This benchmarking report compares your cost and return performance to CEM's extensive pension database.

- 162 U.S. pension funds participate. The median U.S. fund had assets of \$6.7 billion and the average U.S. fund had assets of \$19.7 billion. Total participating U.S. assets were \$3.2 trillion.

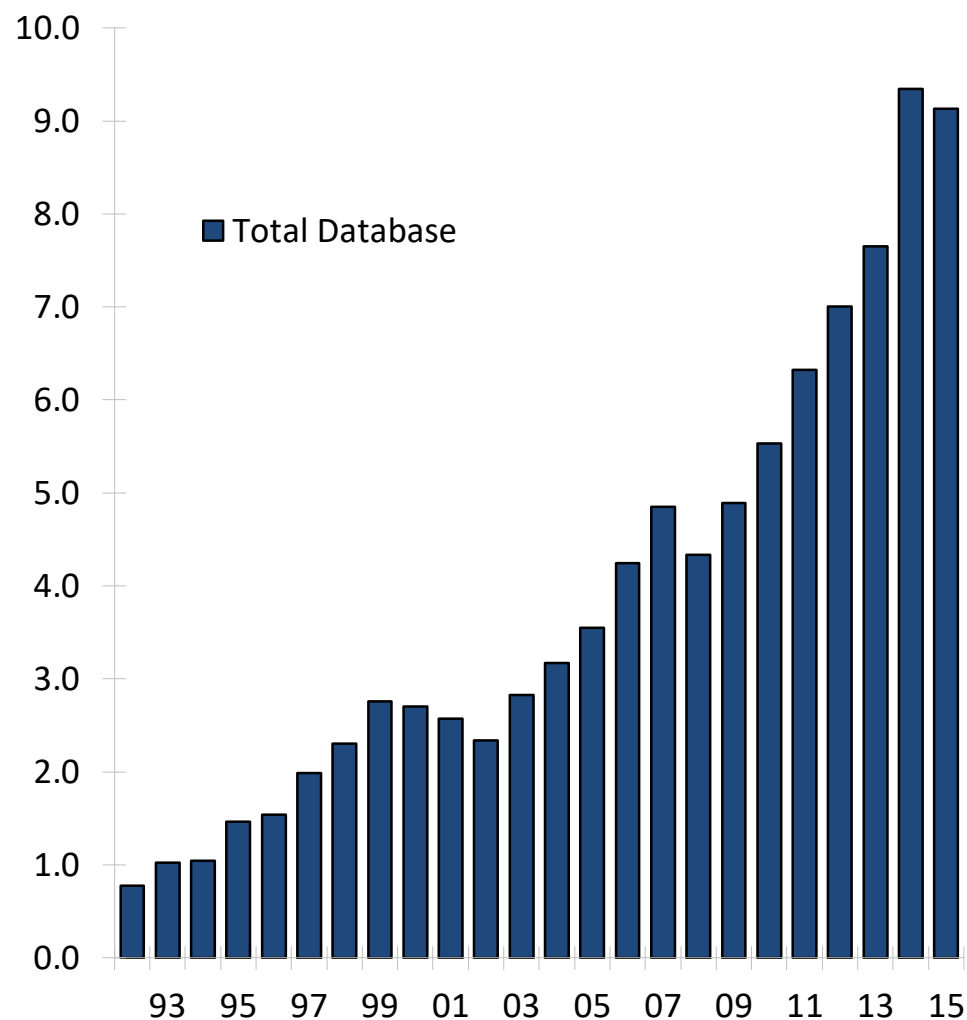
- 72 Canadian funds participate with assets totaling \$996 billion.

- 52 European funds participate with aggregate assets of \$2.7 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Denmark, Switzerland and the U.K.

- 7 Asia-Pacific funds participate with aggregate assets of \$620 billion. Included are funds from Australia, New Zealand, China and South Korea.

The most meaningful comparisons for your returns and value added are to the U.S. Public universe which consists of 55 funds.

Participating assets (\$ trillions)



What gets measured gets managed, so it is critical that you measure and compare the right things:

1. Returns

Why do total returns differ from other funds? What was the impact of your policy mix decisions versus implementation decisions?

2. Net value added

Are your implementation decisions (i.e., the amount of active versus passive management) adding value?

3. Costs

Are your costs reasonable? Costs matter and can be managed.

4. Risk

How much risk was taken to obtain your value added?
What is the risk of your policy mix?

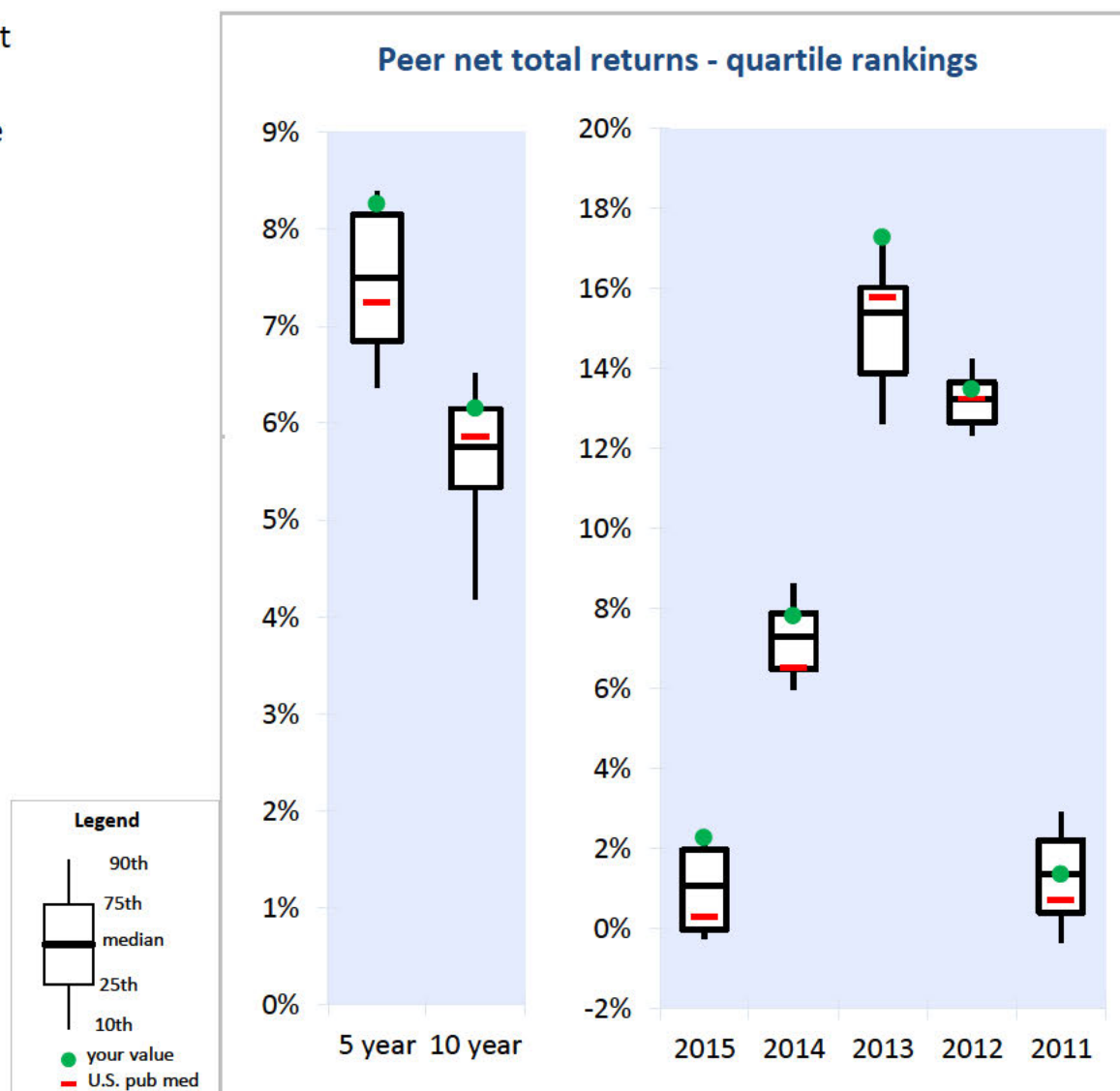
Your 5-year net total return of 8.3% was above the peer median of 7.2%.

Total returns, by themselves, provide little insight into the reasons behind relative performance. Therefore, we separate total return into its more meaningful components: policy return and value added.

	Your 5-year
Net total fund return	8.3%
- Policy return	8.4%
= Net value added	-0.1%

This approach enables you to understand the contribution from both policy mix decisions (which tend to be the board's responsibility) and implementation decisions (which tend to be management's responsibility).

The median 5-year net total return of the U.S. public universe was 7.2%



Your 5-year policy return of 8.4% was above the peer median of 7.3%.

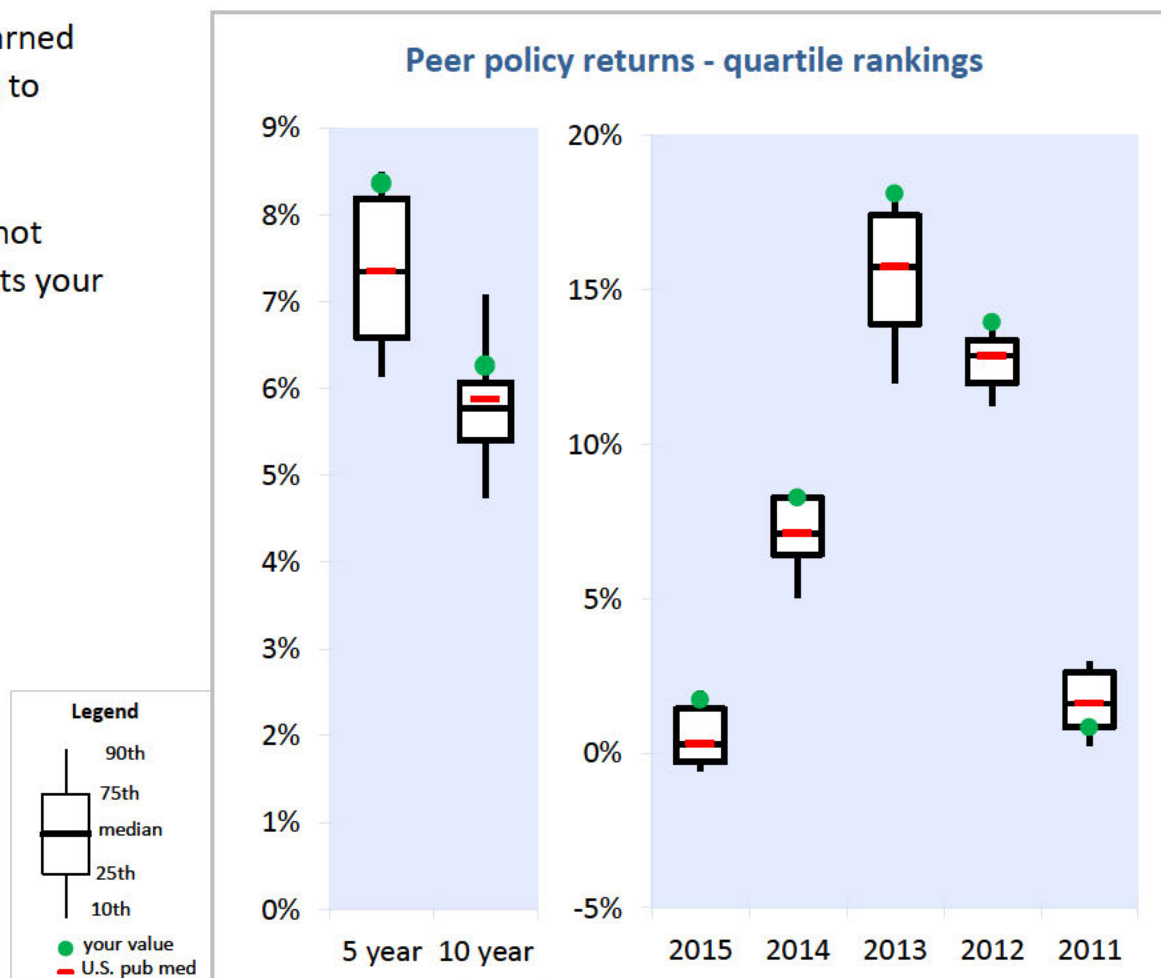
Your policy return is the return you could have earned passively by indexing your investments according to your policy mix.

Having a higher or lower relative policy return is not necessarily good or bad. Your policy return reflects your investment policy, which should reflect your:

- Long term capital market expectations
- Liabilities
- Appetite for risk

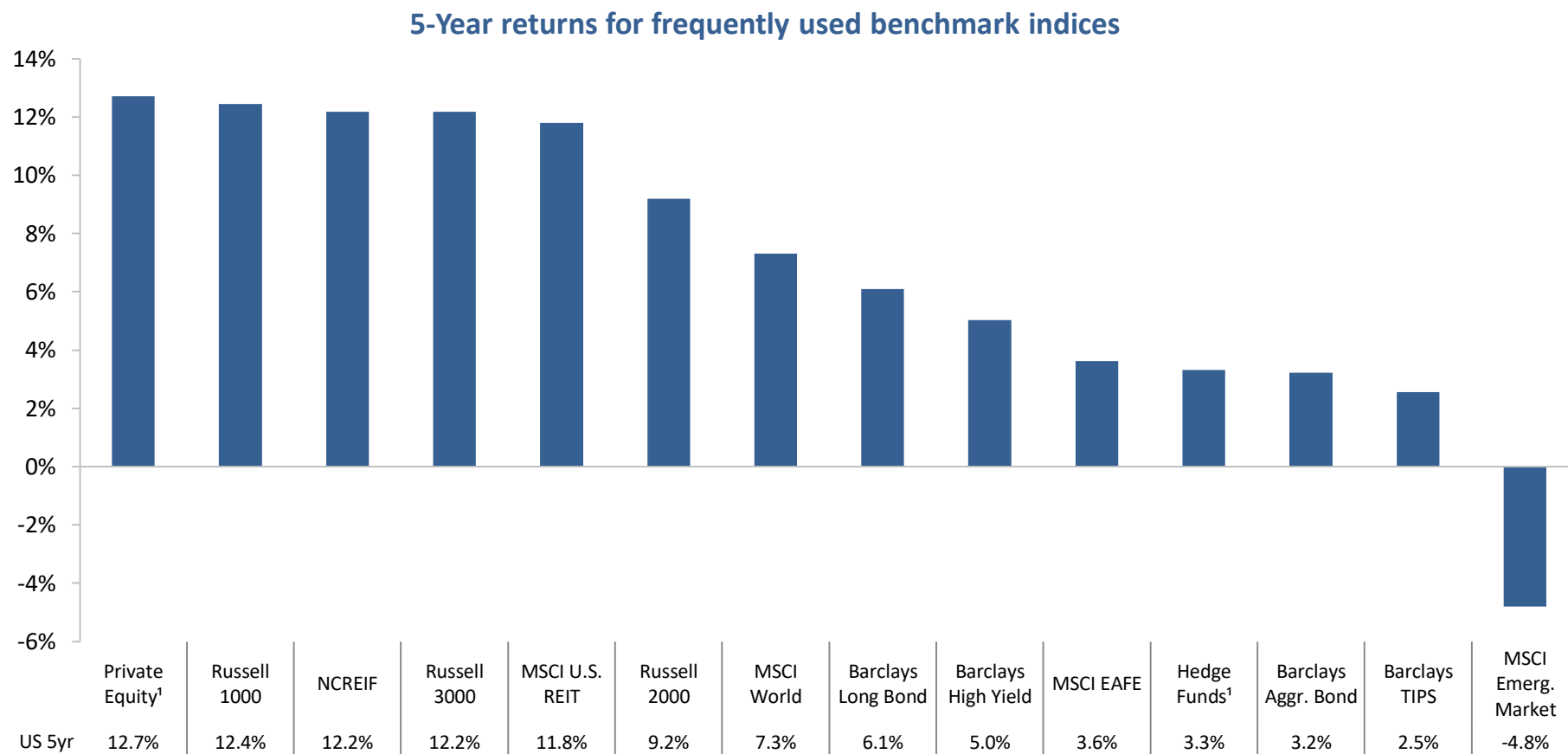
Each of these three factors is different across funds. Therefore, it is not surprising that policy returns often vary widely between funds.

The median 5-year policy return of the U.S. public universe was 7.2%.



To enable fairer comparisons, the policy returns of all participants except your fund were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. If CEM used this same adjustment for your fund, your 5-year policy return would be 8.6%, 0.2% higher than your actual 5-year policy return of 8.4%. Mirroring this, your 5-year total fund net value added would be 0.2% lower. Refer to the Research section pages 6-7 for details.

Differences in policy returns are caused by differences in benchmarks and policy mix. The two best performing asset classes for the 5 years ending 2015 were private equity¹ and large cap stock (Russell 1000).



1. The private equity benchmark is the average of the default private equity benchmark returns applied to U.S. participants. The hedge fund benchmark is the average benchmark return reported by U.S. participants.

Your 5-year policy return was above the peer median primarily because of:

- The positive impact of your higher weight in one of the better performing asset classes of the past 5 years: U.S. Stock.
- The positive impact of your lower weight in Fixed Income. The fixed income asset class generally had lower returns over the last 5 years.

5-year average policy mix

	Your Fund	Peer Avg.	U.S. Public Avg.
U.S. Stock	34%	21%	24%
Non-U.S. Stock	25%	16%	19%
Global Stock	0%	12%	8%
Total Stock	59%	49%	51%
U.S. Bonds	18%	18%	18%
Cash	1%	1%	0%
Other Fixed Income ¹	0%	8%	9%
Total Fixed Income	19%	26%	27%
Real Estate incl. REITS	10%	9%	7%
Total Alternatives	12%	16%	15%
Total	100%	100%	100%

1. Other fixed income includes U.S., Inflation Indexed, High Yield and Global bonds. Totals may not add up due to rounding.

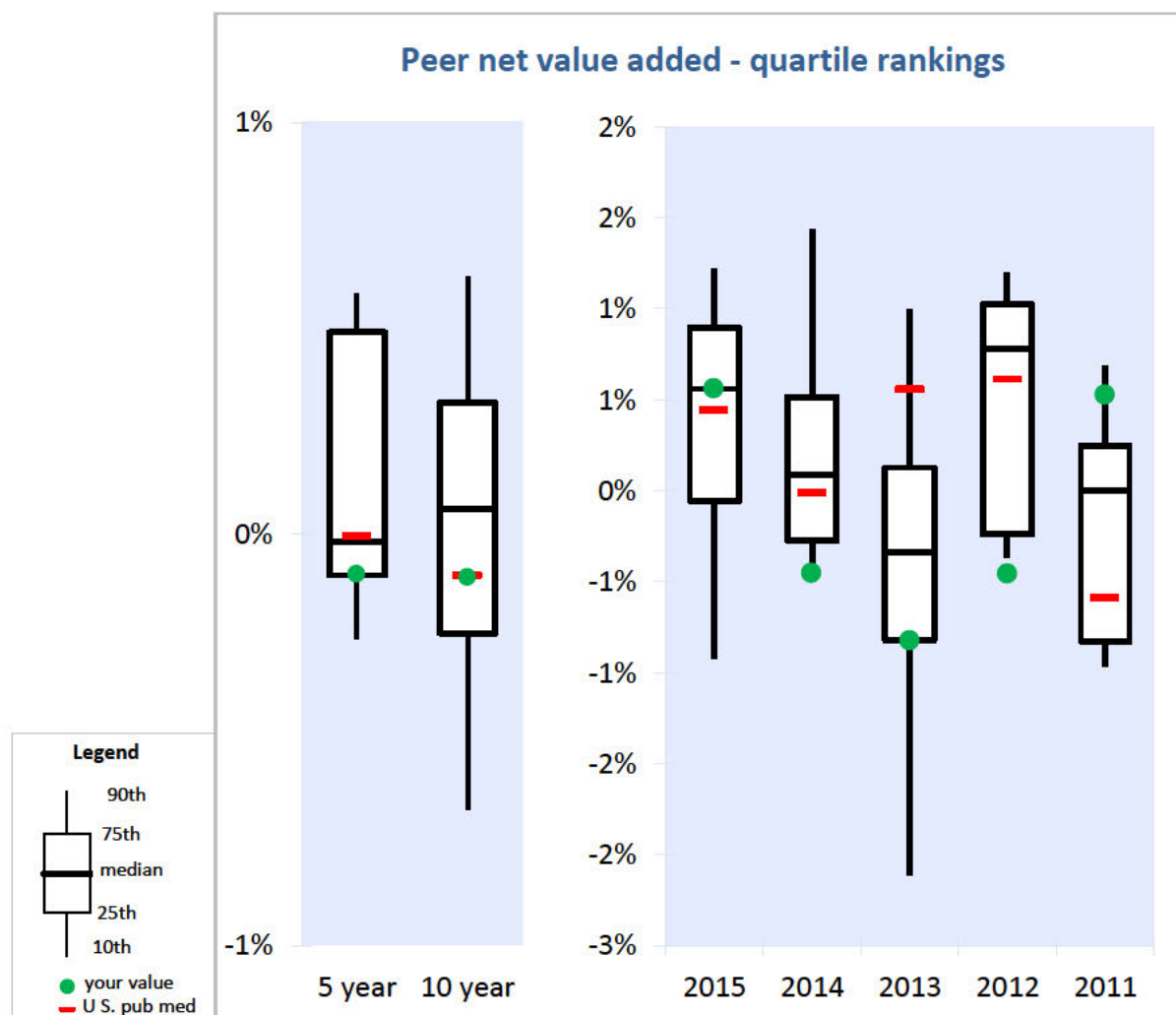
Net value added is the component of total return from active management. Your 5-year net value added was -0.1%.

Net value added equals total net return minus policy return.

Value added for STRS Ohio

Year	Net Return	Policy Return	Net value Added
2015	2.3%	1.7%	0.6%
2014	7.8%	8.3%	(0.5%)
2013	17.3%	18.1%	(0.8%)
2012	13.5%	13.9%	(0.5%)
2011	1.4%	0.8%	0.5%
5-year	8.3%	8.4%	(0.1%)

Your 5-year net value added of -0.1% compares to a median of 0.0% for your peers and 0.0% for the U.S. Public universe.



Your value added was impacted by your choice of benchmarks for private equity. CEM suggests using lagged, investable benchmarks for private equity (see Research section, pages 6-7, for reasons why). If your fund used the private equity benchmark suggested by CEM, your 5-year total fund value added would have been 0.2% lower.

Your investment costs were \$248.8 million or 34.5 basis points in 2015.

Asset management costs by asset class and style (\$000s)	Internal Management			External Mgmt		Total
	Passive	Active	Overseeing of external	Active base fees	Perform. fees	
U.S. Stock - Large Cap	41	11,893	143	2,168		14,245
U.S. Stock - Small Cap		293	141	8,895		9,330
Stock - EAFE		2,834	254	19,935		23,022
Stock - Emerging		2,595	264	5,318		8,177
Stock - ACWIxU.S.		433	24	5,022		5,480
Stock - Global		457				457
Fixed Income - U.S.		2,413				2,413
Fixed Income - Emerging			170	3,587		3,757
Fixed Income - High Yield			277	4,428		4,705
Cash		269				269
Global TAA			28	678		706
Hedge Funds - Direct			300	35,310		35,610
Real Estate		16,561				16,561
Real Estate - LPs			444	17,544		17,987
Infrastructure - Fund of Funds			40	1,960		2,000
Natural Resources		110				110
Natural Resources - LPs			102	7,654		7,755
Diversified Private Equity			11	1,426		1,437
LBO			330	32,052		32,382
LBO - Fund of Funds			218	14,367		14,585
Venture Capital			354	15,318		15,673
Venture Capital - Fund of Funds			19	5,164		5,183
Other Private Equity		118	867	18,315		19,300
Other Private Equity - Co-investments			0.1			0.1
Overlay Programs		112	346			457
Total excluding private asset performance fees						241,601 33.5bp
Oversight, custodial and other costs ¹						
Oversight & consulting						4,539
Trustee & custodial						2,150
Audit						158
Other						375
Total oversight, custodial & other costs						7,222 1.0bp
Total investment costs (excl. transaction costs & private asset performance fees)						248,824 34.5bp

* Internal investment costs were 5.9 bps while external investment costs were 27.6 bps.

Of the total investment management costs of 34.5 bps, external manager fees for alternative and real estate investments were 20.7 bps; other investment costs for internal assets, external equity and external fixed income investments that were used to arrive at the net of fee Total Fund return were 13.7 bps.

Footnotes

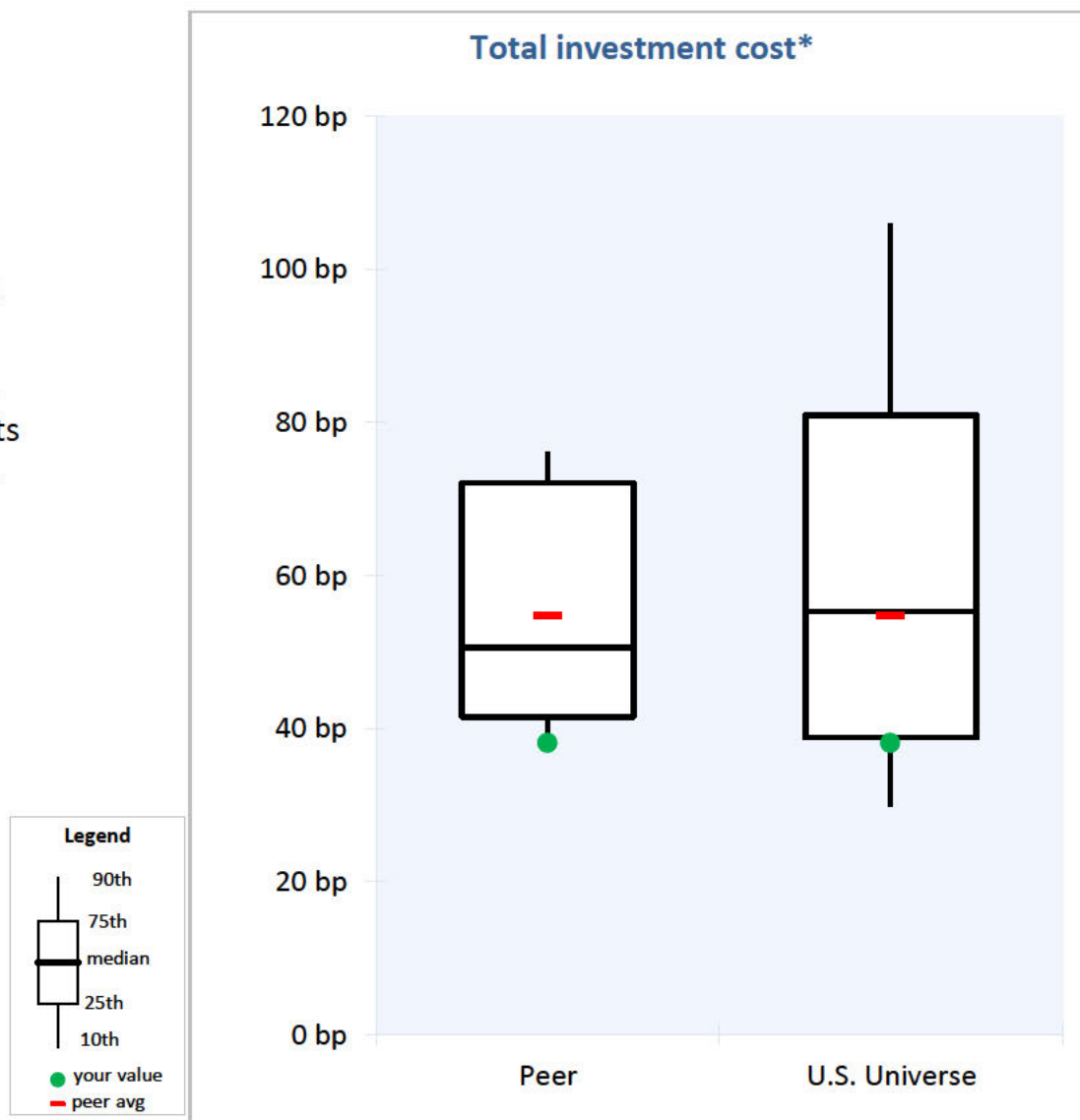
¹ Excludes non-investment costs, such as PBGC premiums and preparing checks for retirees.

Your total investment cost of 38.0 bps was below the peer median of 50.5 bps.

For the comparison to the peer group, CEM has included your 34.5 bps in costs from page 10 and added hedge fund performance fees and private equity management fee offsets.

Differences in total investment cost are often caused by asset mix, particularly holdings of the highest cost asset classes: real estate (excl. REITS), infrastructure, hedge funds and private equity. These high cost assets equaled 23% of your fund's assets at the end of 2015 versus a peer average of 25%.

Therefore, to assess whether your costs are high or low given your unique asset mix and size, CEM calculates a benchmark cost for your fund. This analysis is shown on the following page.



* Total investment cost excludes transaction costs and private asset performance fees; but includes public market and hedge fund performance fees, and private equity management fee offsets.

Benchmark cost analysis suggests that, after adjusting for fund size and asset mix, your fund was low cost by 6.8 basis points in 2015.

Your benchmark cost is an estimate of what your cost would be given your actual asset mix and the median costs that your peers pay for similar services. It represents the cost your peers would incur if they had your actual asset mix.

Your total cost of 38.0 bp was below your benchmark cost of 44.9 bp. Thus, your cost savings was 6.8 bp.

Your cost versus benchmark

	\$000s	basis points
Your total investment cost	274,578	38.0 bp
Your benchmark cost	324,019	44.9 bp
Your excess cost	(49,441)	(6.8) bp

Your fund was low cost because you had a lower cost implementation style and you paid less than peers for similar services.

Reasons for your low cost status

	Excess Cost/ (Savings)	
	\$000s	bps
1. Lower cost implementation style		
• More fund of funds	4,027	0.6
• Less external active management (more lower cost passive and internal)	(48,699)	(6.7)
• More overlays	332	0.0
• Other style differences	3,961	0.5
	(40,379)	(5.6)
2. Paying less than peers for similar services		
• External investment management costs	(15,724)	(2.2)
• Internal investment management costs	7,161	1.0
• Oversight, custodial & other costs	(500)	(0.1)
	(9,063)	(1.3)
Total savings	(49,441)	(6.8)

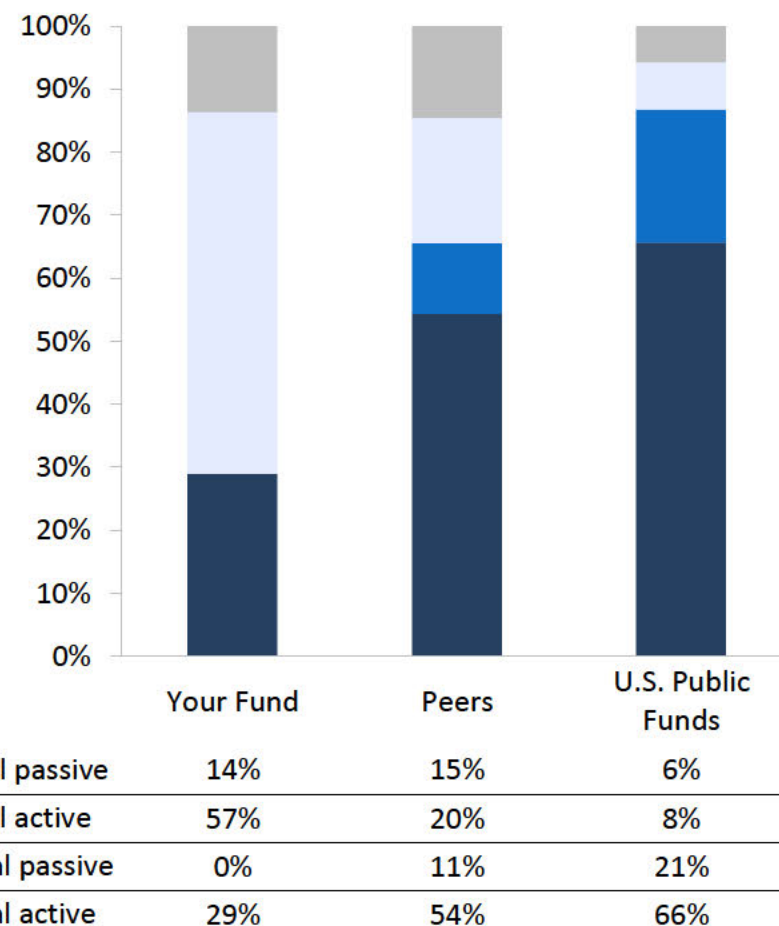
Differences in cost performance are often caused by differences in implementation style.

Implementation style is defined as the way in which your fund implements asset allocation. It includes internal, external, active, passive and fund of funds styles.

The greatest cost impact is usually caused by differences in the use of:

- External active management because it tends to be much more expensive than internal or passive management. You used less external active management than your peers (your 29% versus 54% for your peers).
- Fund of funds usage because it is more expensive than direct fund investment. You had similar amounts in fund of funds. Your 7% of alternatives (hedge funds, real estate, infrastructure, natural resources and private equity) in fund of funds compared to 6% for your peers.

Implementation style¹



1. The graph above does not take into consideration the impact of derivatives.

If your internally managed assets were managed externally and you paid peer median costs, your costs would have been higher by approximately \$102 million.

Additional External Investment Management Costs: Assuming STRS Ohio no longer had internal holdings and paid peer median external costs.

	<u>STRS Ohio</u>		<u>Peers</u>	<u>Difference</u>	
	Average holdings in \$mils	Actual Internal Costs	External Median Costs	in bps	Savings in \$000s
U.S. Stock - Large Cap - Passive	8,715	0.05	1.1	(1.1)	(936)
U.S. Stock - Large Cap - Active	10,836	11.0	25.5	(14.5)	(15,734)
U.S. Stock - Small Cap - Active	811	3.6	63.0	(59.3)	(4,815)
Stock - EAFE - Active	5,618	5.0	35.6	(30.5)	(17,160)
Stock - Emerging - Active	1,833	14.2	54.7	(40.6)	(7,439)
Stock - ACWIxU.S. - Active	2,753	1.6	43.2	(41.6)	(11,463)
Stock - Global - Active	783	5.8	38.9	(33.1)	(2,592)
Fixed Income - U.S. - Active	10,404	2.3	14.7	(12.4)	(12,882)
Global TAA - Active	192	36.8	65.3	(28.6)	(548)
REITs - Passive	1,132	0.0	12.0*	(12.0)	(1,359)
Real Estate ex-REITs - Active	5,366	30.9	62.1	(31.2)	(16,746)
Natural Resources - Active	439	2.5	97.6	(95.1)	(4,176)
Other Private Equity - Limited Partnership	782	8.1	81.7	(73.6)	(5,756)
Total external investment management impact				(14.1) bp	(101,607)

*Universe median used as peer data was insufficient.

Differences in implementation style saved you 5.6 bp relative to your peers.

Calculation of the cost impact of differences in implementation style

Asset class	Your avg holdings in	% External active			Premium vs passive &	Cost/ (savings)	
	\$mils	You	Peer average	More/ (less)	internal ¹	\$000s bps	
	(A)			(B)	(C)	(A X B X C)	
U.S. Stock - Large Cap	20,543						
U.S. Stock - Small Cap	1,932						
Stock - EAFE	11,291						
Stock - Emerging	2,830						
Stock - ACWIxU.S.	3,851						
Stock - Global	783						
Fixed Income - U.S.	10,404						
Fixed Income - Emerging	798						
Fixed Income - High Yield	1,091						
Global TAA	192						
REITs	1,132						
Infrastructure	92						
Real Estate ex-REITs	6,866						
Partnerships, as a proportion of external:	1,500						
Natural Resources	957						
Partnerships, as a proportion of external:	518						
Diversified Private Equity	75						
LBO	4,303						
Venture Capital	1,703						
Other private equity	2,622						
Impact of less/more external active vs. lower cost styles						(48,699)	(6.7) bp
		Fund of funds % of LPs			vs. direct LP ¹		
Hedge Funds	2,045						
Infrastructure - LPs	92						
Performance Fee Impact (on NAV):	103						
Real Estate ex-REITs - LPs	1,500						
Natural Resources - LPs	518						
Diversified Private Equity - LPs	75						
LBO - LPs	4,303						
Venture Capital - LPs	1,703						
Impact of less/more fund of funds vs. direct LPs						4,027	0.6 bp
		Overlays and other					
Impact of higher use of portfolio level overlays						332	0.0 bp
Impact of mix of internal passive, internal active, and external passive ³						3,961	0.5 bp
Total impact of differences in implementation style						(40,379)	(5.6) bp

Footnotes

1. The cost premium is the additional cost of external active management relative to the average of other lower cost implementation styles - internal passive, internal active and external passive.

2. A cost premium listed as 'Insufficient' indicates that there was not enough peer data to calculate the premium.

3. The 'Impact of mix of internal passive, internal active and external passive' quantifies the net cost impact of differences in cost between, and your relative use of, these 'low-cost' styles.

The net impact of paying more/less for external asset management costs saved 2.2 bps.

Cost impact of paying more/(less) for external asset management

	Your avg holdings in \$mils	Cost in bps			Cost/ (savings) in \$000s
		Your Fund	Peer median	More/ (less)	
	(A)			(B)	(A X B)
U.S. Stock - Large Cap - Active	992	■	■	■	■
U.S. Stock - Small Cap - Active	1,121	■	■	■	■
Stock - EAFE - Active	5,673	■	■	■	■
Stock - Emerging - Active	997	■	■	■	■
Stock - ACWIxU.S. - Active	1,098	■	■	■	■
Fixed Income - Emerging - Active	798	■	■	■	■
Fixed Income - High Yield - Active	1,091	■	■	■	■
Global TAA - Active	192	■	■	■	■
Hedge Funds - Active	2,045	■	■	■	■
Infrastructure - Fund of Fund	92	■	■	■	■
Real Estate ex-REITs - Limited Partnership	1,500	■	■	■	■
Natural Resources - Limited Partnership	518	■	■	■	■
Diversified Private Equity - Active	75	■	■	■	■
LBO - Active	3,337	■	■	■	■
LBO - Fund of Fund	966	■	■	■	■
Venture Capital - Active	1,483	■	■	■	■
Venture Capital - Fund of Fund	220	■	■	■	■
Other Private Equity - Active	2,476	■	■	■	■
<i>Notional</i>					
Derivatives/Overlays - Currency - Hedge	4,358	■	■	■	■
Total impact of paying more/less for external management					(15,724)
Total in bps					(2.2) bp

'Excluded' indicates that the asset class was excluded from this analysis due to comparability concerns with peers.

*Universe median used as peer data was insufficient.

The net impact of paying more/less for internal asset management costs added 1.0 bps.

Cost impact of paying more/(less) for internal asset management

	Your avg holdings in \$mils	Cost in bps			Cost/ (savings) in \$000s
		Your Fund	Peer median	More/ (less)	
	(A)			(B)	(A X B)
U.S. Stock - Large Cap - Passive	8,715	■	■	■	■
U.S. Stock - Large Cap - Active	10,836	■	■	■	■
U.S. Stock - Small Cap - Active	811	■	■	■	■)
Stock - EAFE - Active	5,618	■	■	■	■
Stock - Emerging - Active	1,833	■	■	■	■
Stock - ACWIxU.S. - Active	2,753	■	■	■	■
Stock - Global - Active	783	■	■	■	■
Fixed Income - U.S. - Active	10,404	■	■	■	■
REITs - Passive	1,132	■	■	■	■
Real Estate ex-REITs - Active	5,366	■	■	■	■
Natural Resources - Active	439	■	■	■	■
Other Private Equity - Active	146	■	■	■	■
<i>Notional</i>					
Derivatives/Overlays - Currency - Hedge	4,664	■	■	■	■
Total impact of paying more/less for internal management					7,161
Total in bps					1.0 bp

'Insufficient' indicates insufficient peer and universe data to do meaningful comparisons.

'Excluded' indicates that the asset class was excluded from this analysis due to comparability concerns with peers.

The net impact of differences in oversight, custodial & other costs saved 0.1 bps.

Cost impact of differences in oversight, custodial & other costs

	Your avg holdings in \$mils	Cost in bps			Cost/ (savings) in \$000s
		Your fund	Peer median	More/ (less)	
	(A)			(B)	(A X B)
Oversight & consulting	72,206	■	■	■	■
Custodial	72,206	■	■	■	■
Audit	72,206	■	■	■	■
Other	72,206	■	■	■	■
Total					(500)
Total in bps					(0.1) bp

Your fund was low cost because you had a low cost implementation style and you paid less than peers for similar services.

Why are you high/(low) cost by asset class?

Asset class/category	Due to impl. style \$000s	Due to paying more/(less)	Total \$000s	Total bps
U.S. Stock - Large Cap	(3,437)	6,388	2,951	
U.S. Stock - Small Cap	30	1,857	1,888	
Stock - EAFE	2,092	0	2,092	
Stock - Emerging	(3,978)	805	(3,173)	
Stock - ACWIxU.S.	(5,827)	301	(5,526)	
Stock - Global	(1,948)	0	(1,948)	
Fixed Income - U.S.	(3,694)	0	(3,694)	
Fixed Income - Emerging	0	420	420	
Fixed Income - High Yield	96	358	454	
Global TAA	0	(548)	(548)	
Hedge funds	(2,176)	0	(2,176)	
Infrastructure	1,028	119	1,147	
REITs	(3,575)	0	(3,575)	
Real Estate ex-REITs	(20,586)	4,647	(15,940)	
Natural Resources	(3,911)	1,850	(2,061)	
Diversified Private Equity	(32)	198	166	
LBO	4,492	(14,037)	(9,545)	
Venture Capital	715	(9,882)	(9,167)	
Other private equity	0	0	0	
Overlays	332	(1,039)	(707)	
Oversight, Custodial & Other		(500)	(500)	
Total	(40,379)	(9,063)	(49,441)	(6.8) bp

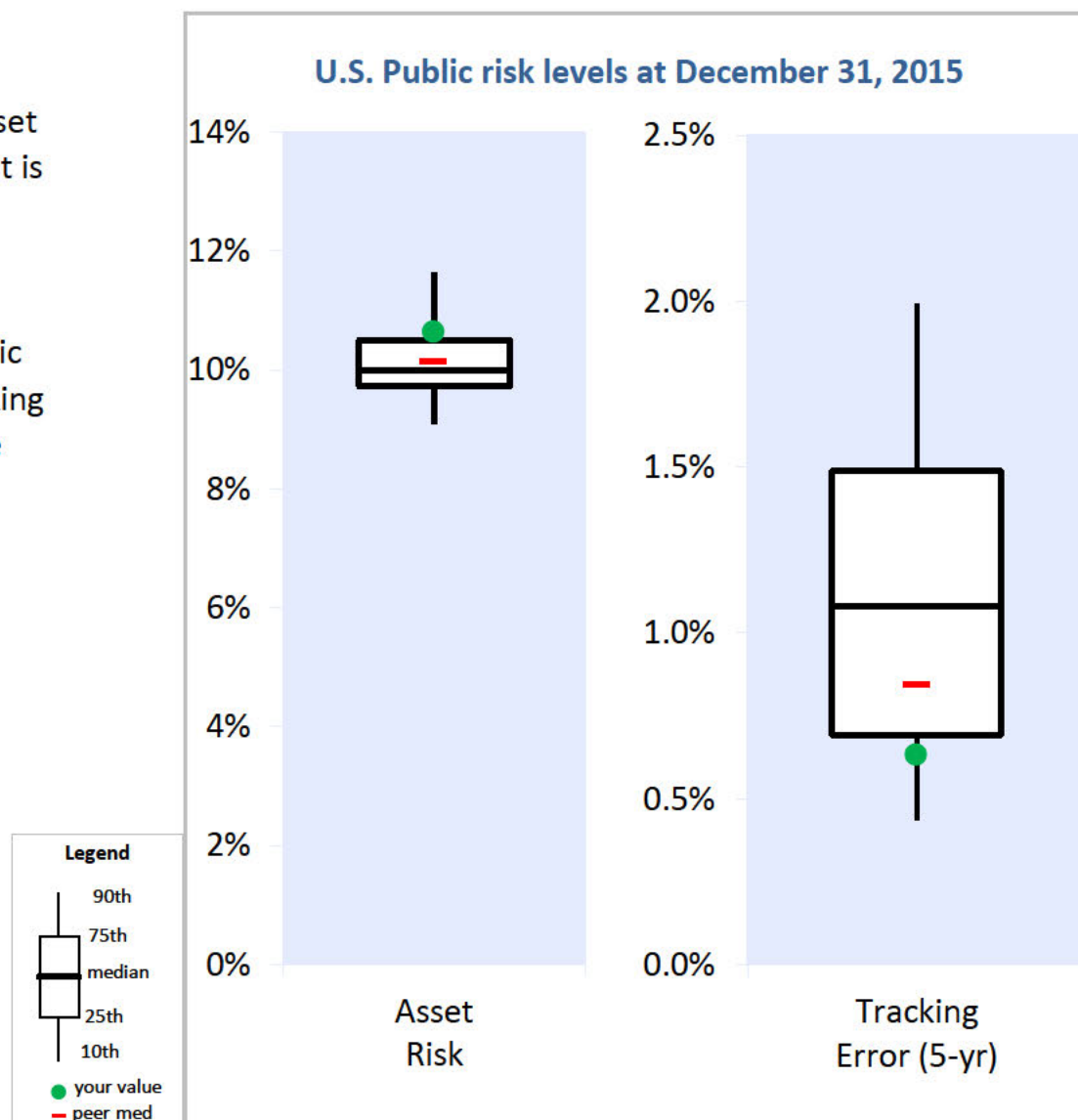
Your net value added relative to total cost



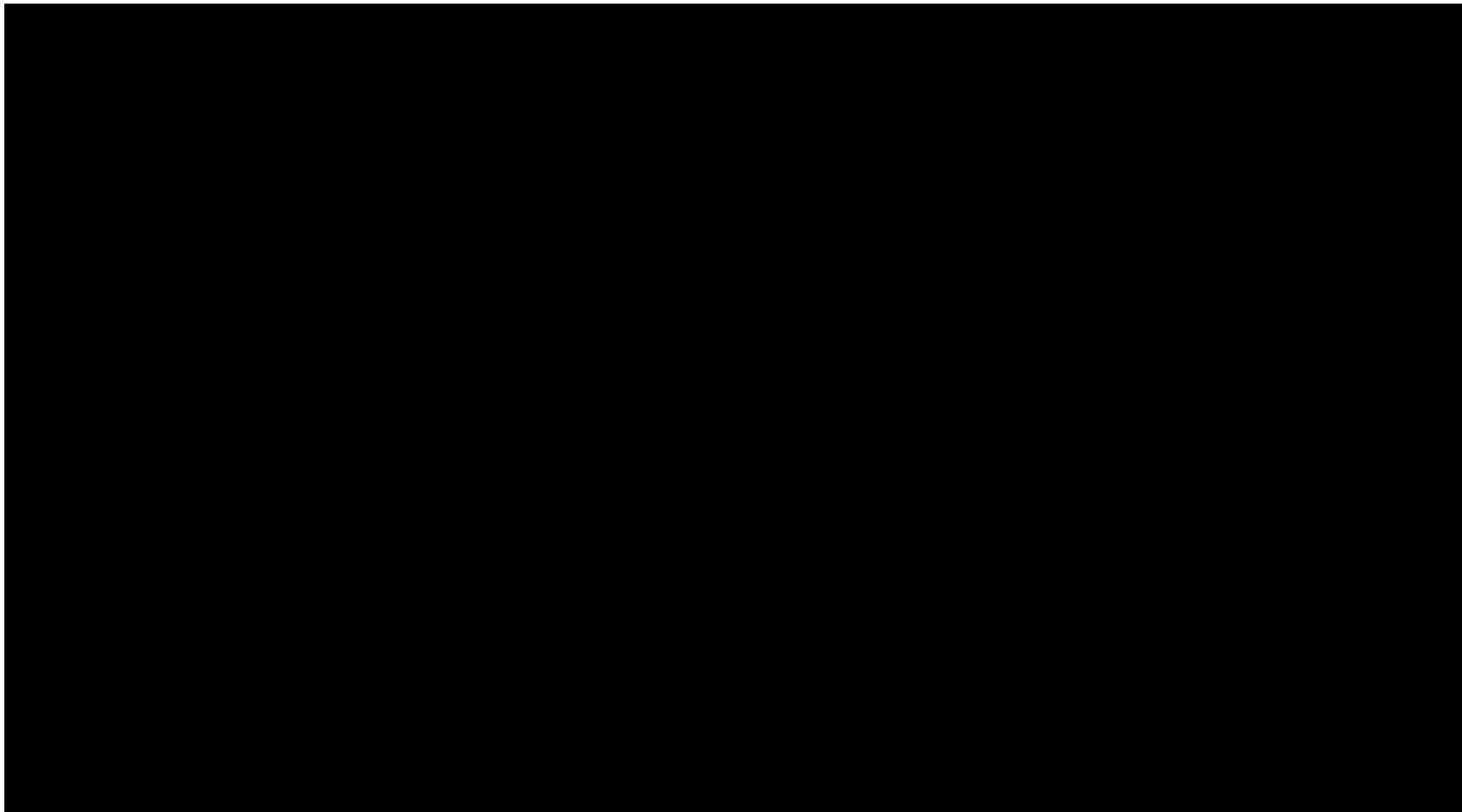
Comparison of risk levels

Your asset risk of 10.6% was above the U.S. Public median of 10.0% and the peer median of 10.2%. Asset risk is the standard deviation of your policy return. It is based on the historical variance of, and covariance between, the asset classes in your policy mix.

Your tracking error of 0.6% was below the U.S. Public median of 1.1% and the peer median of 0.8%. Tracking error is the risk of active management. It equals the standard deviation of your annual net value added.



During the 5-year period ending 2015, U.S. funds were rewarded for taking asset risk. More risk resulted in better performance.



Summary of key takeaways

Returns

- Your 5-year net total return of 8.3% was in the top quartile of our U.S. Public universe. This compares to the U.S. Public median of 7.2% and the peer median of 7.5%.
- Your 5-year policy return was 8.4%. This was above the U.S. Public median of 7.2% and above the peer median of 7.3%.

Value added

- Your 5-year net value added was -0.1%. This was close to the U.S. Public median of 0.0% and close to the peer median of 0.0%.

Cost and cost effectiveness

- Your investment cost for benchmarking purposes of 38.0 bps was below your benchmark cost of 44.9 bps. This suggests that your fund was low cost compared to your peers. You were low cost because you had a lower cost implementation style and paid less than peers for similar services

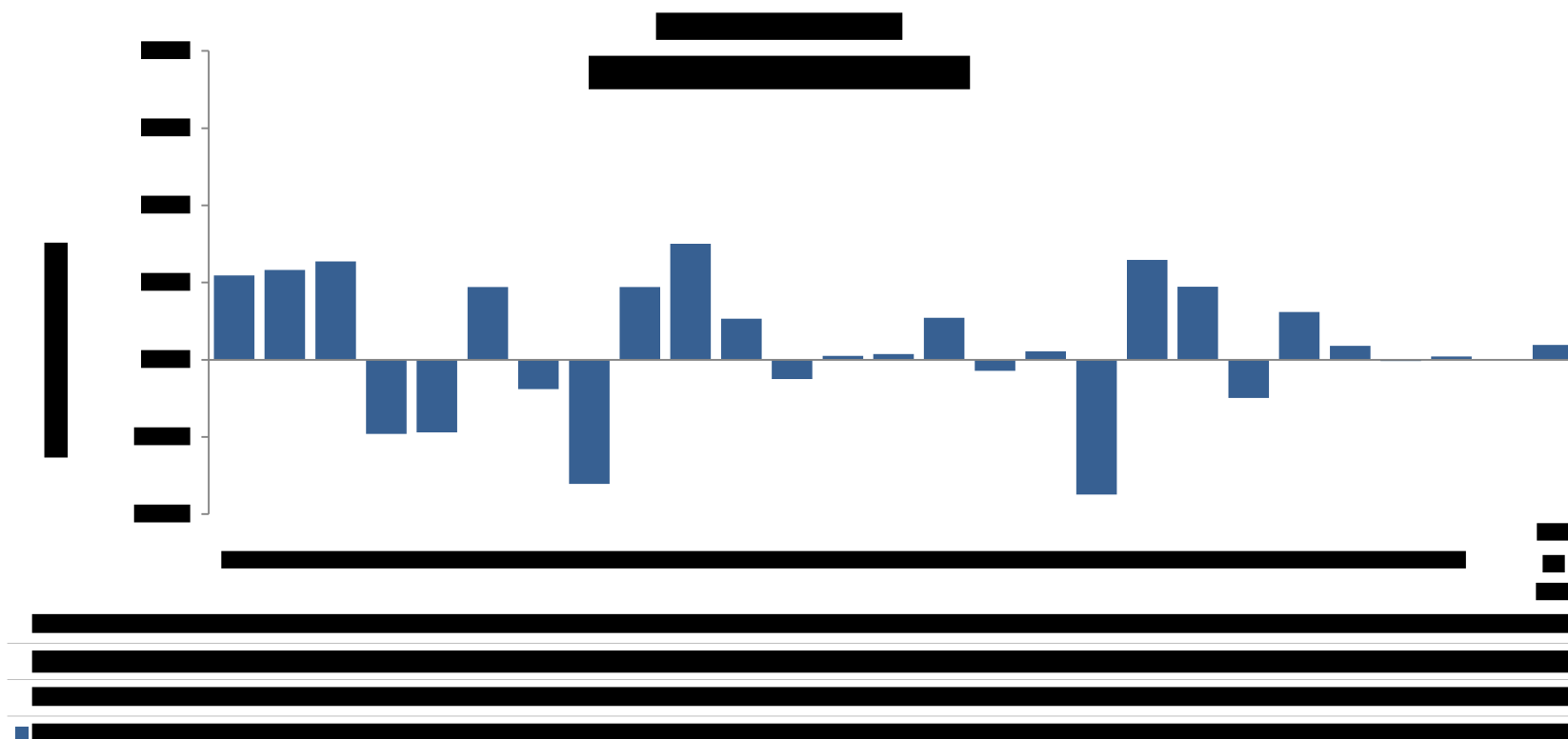
Risk

- Your asset risk of 10.6% was above the U.S. Public median of 10.0% and the peer median of 10.2%. Your tracking error of 0.6% was below the U.S. Public median of 1.1% and the peer median of 0.8%.

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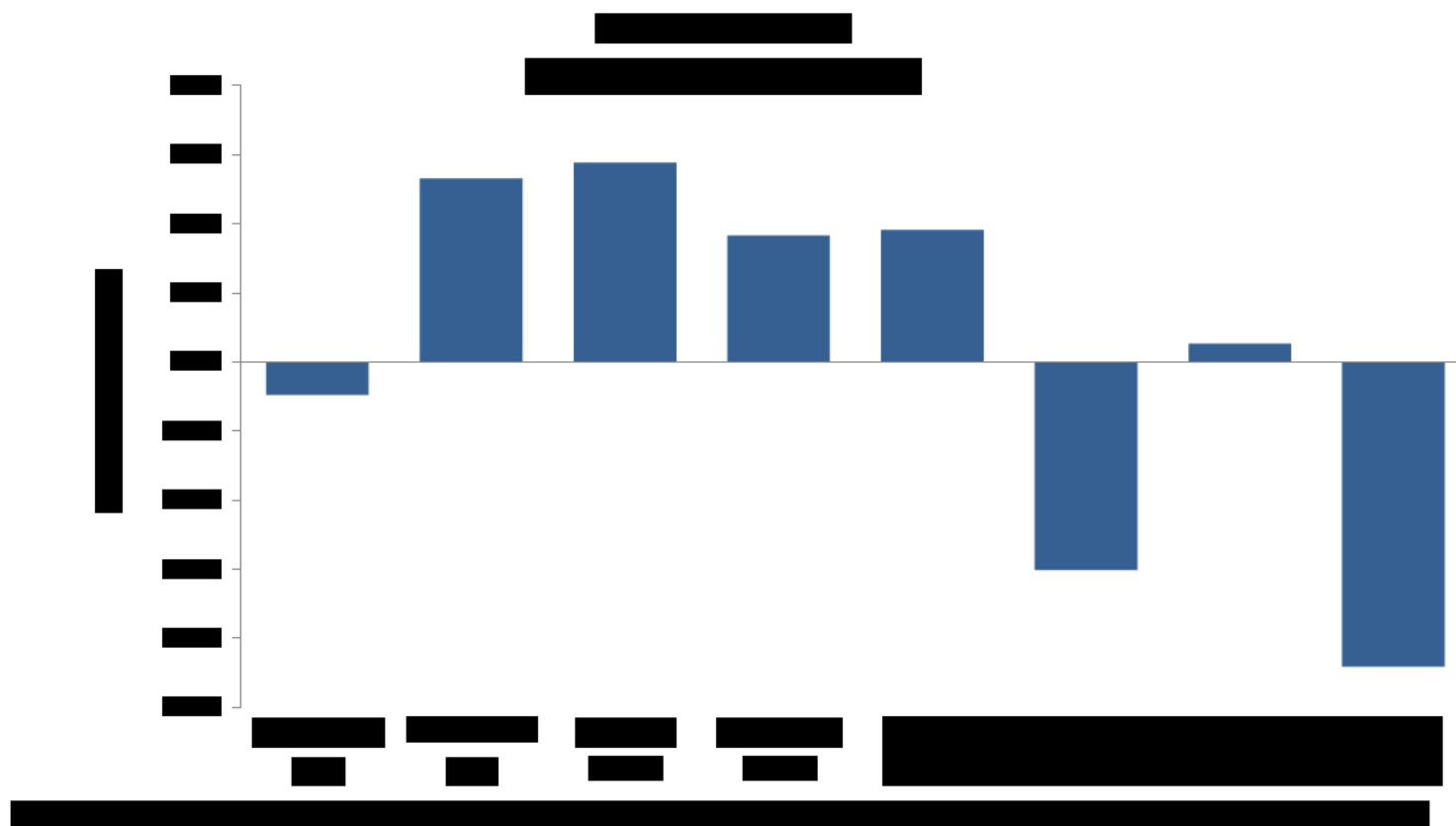
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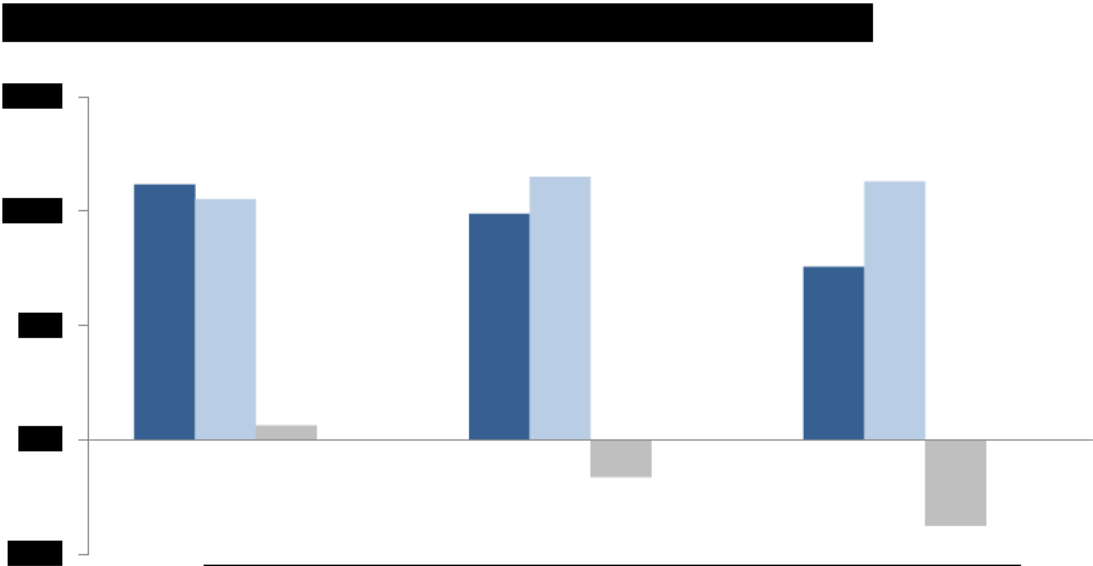
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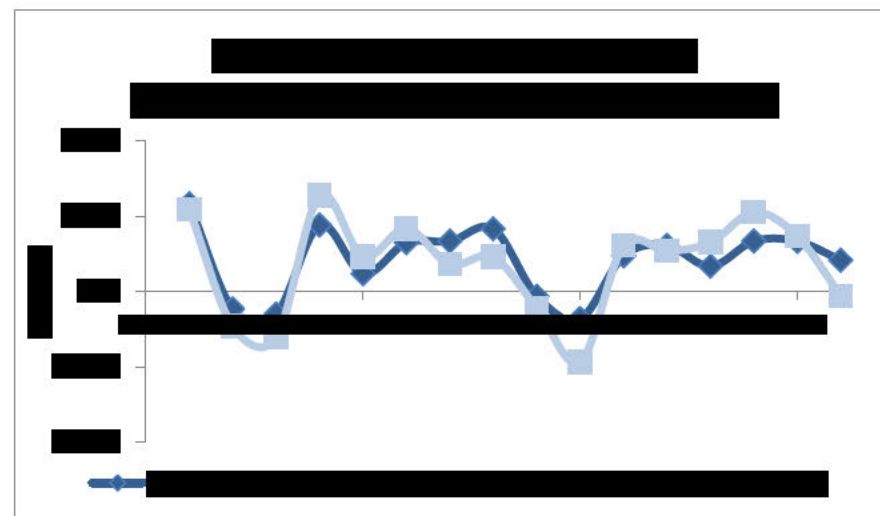
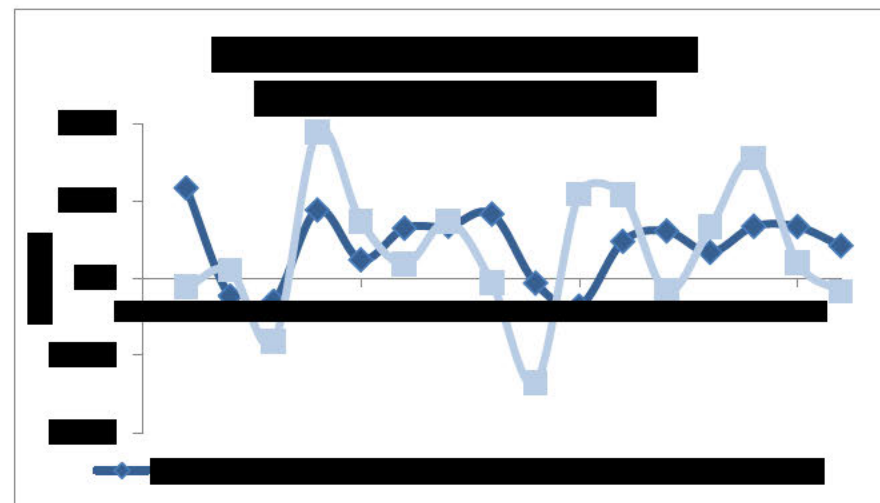
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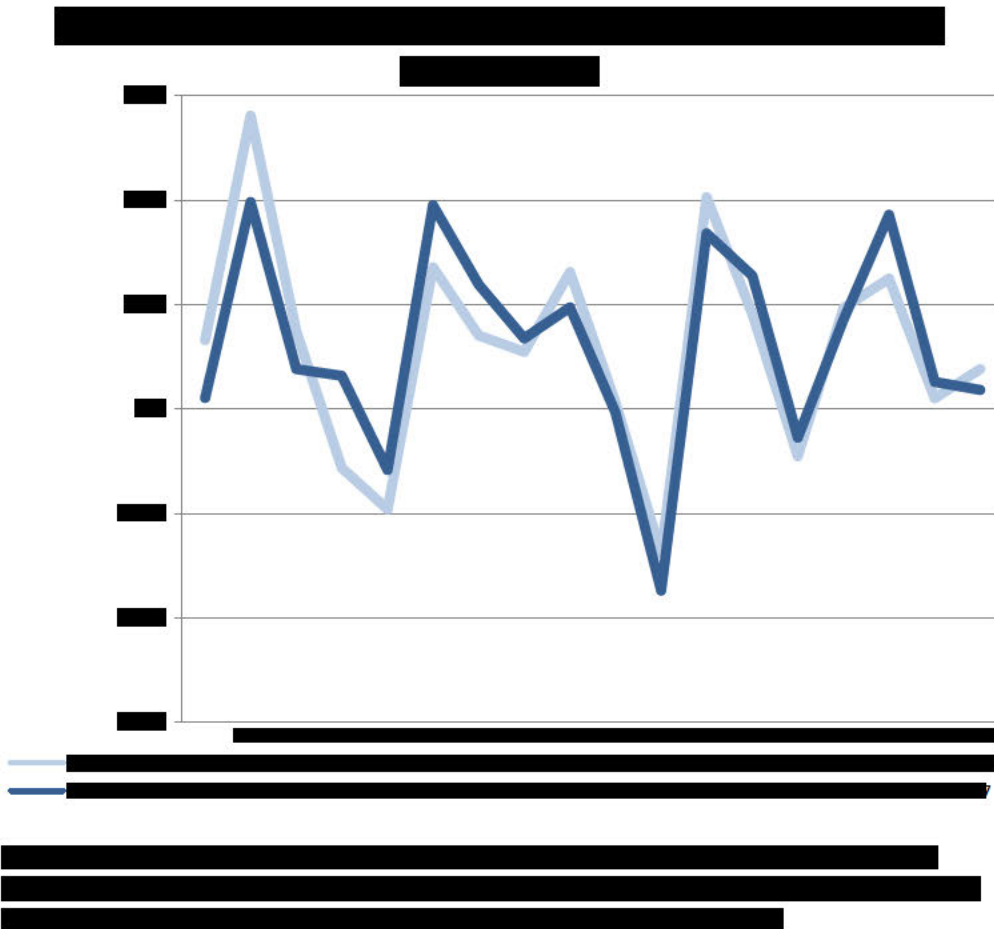
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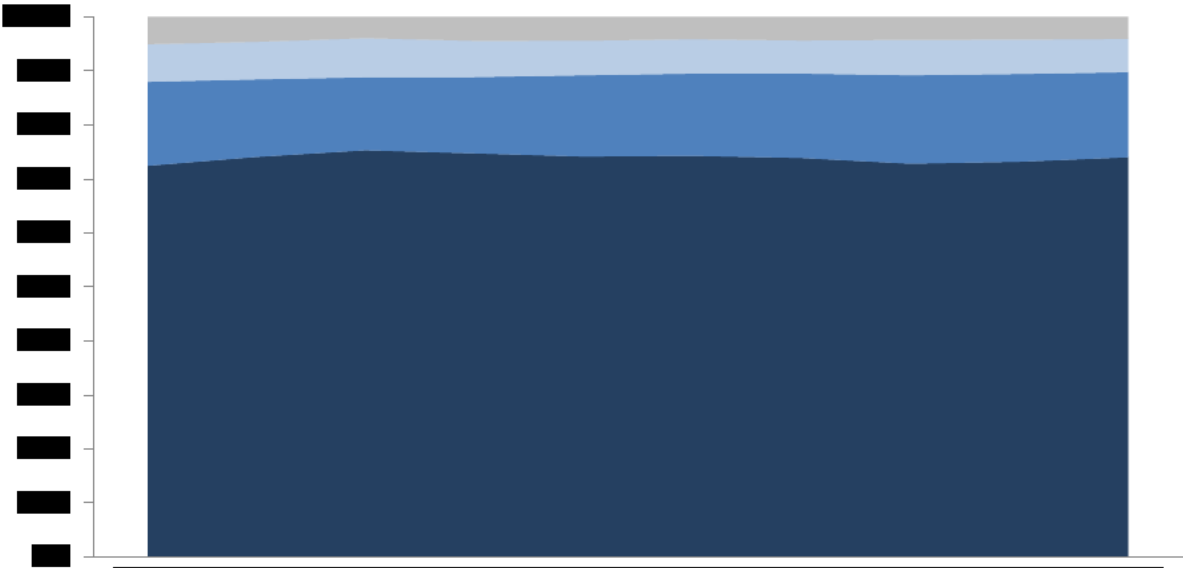
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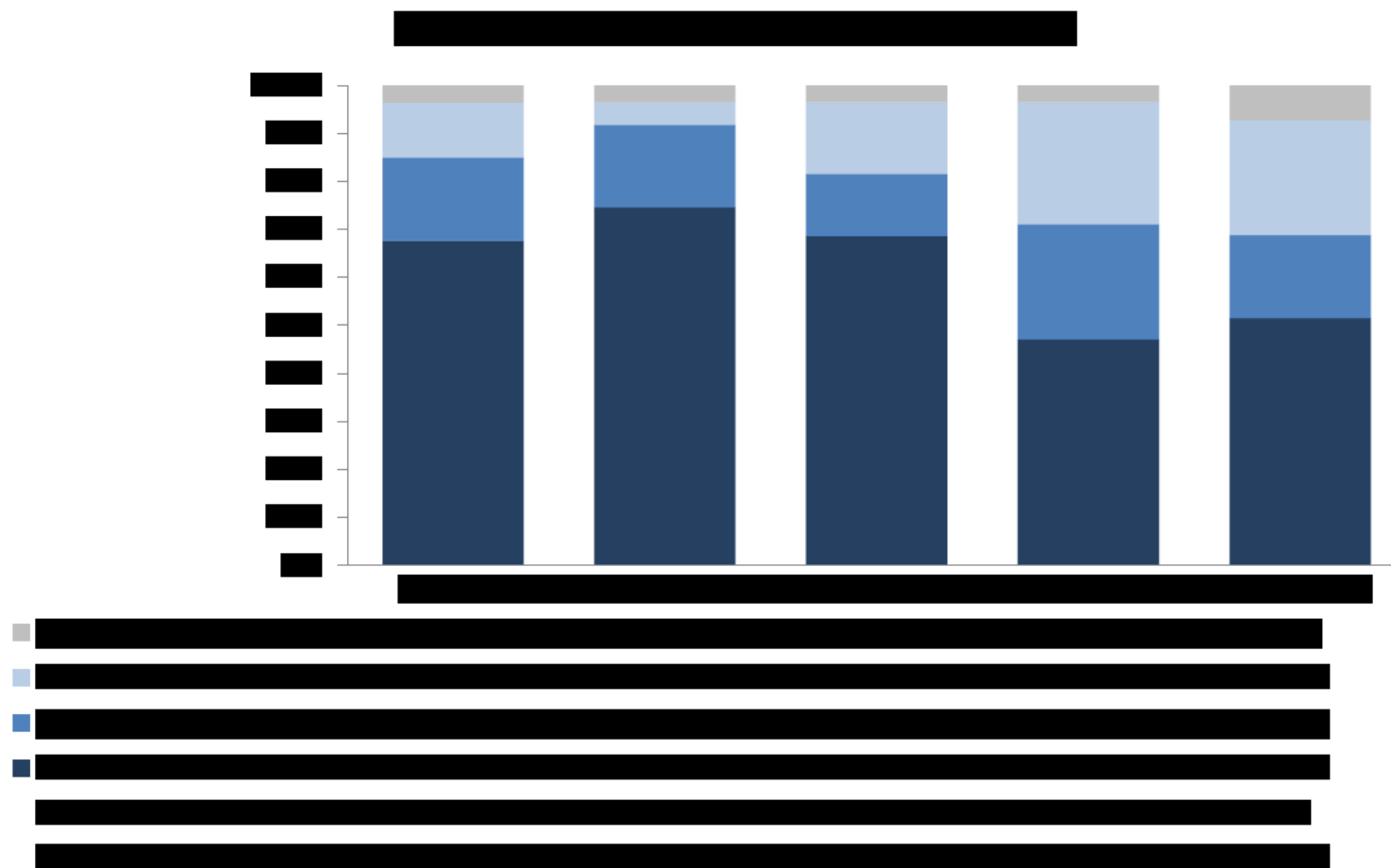
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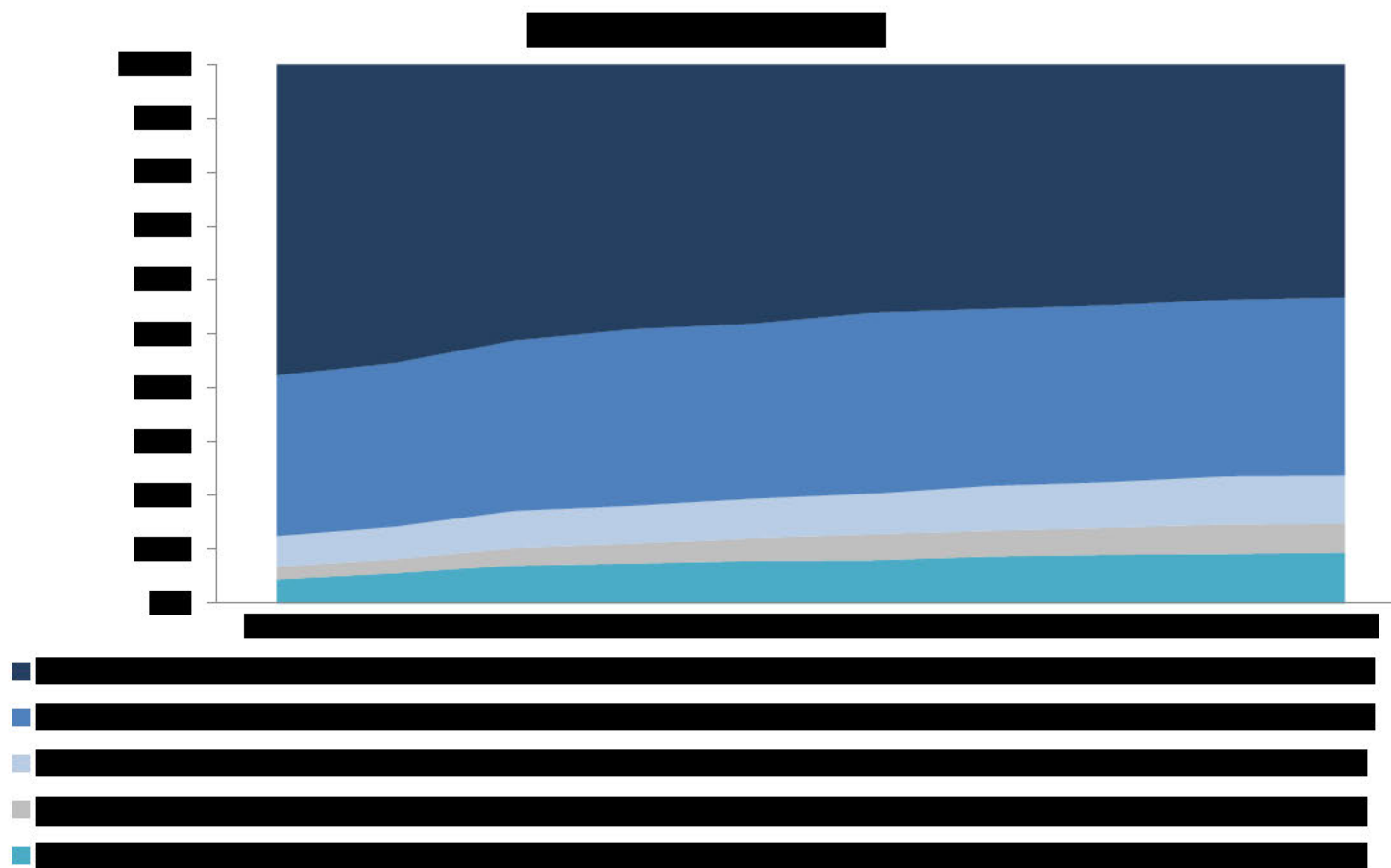
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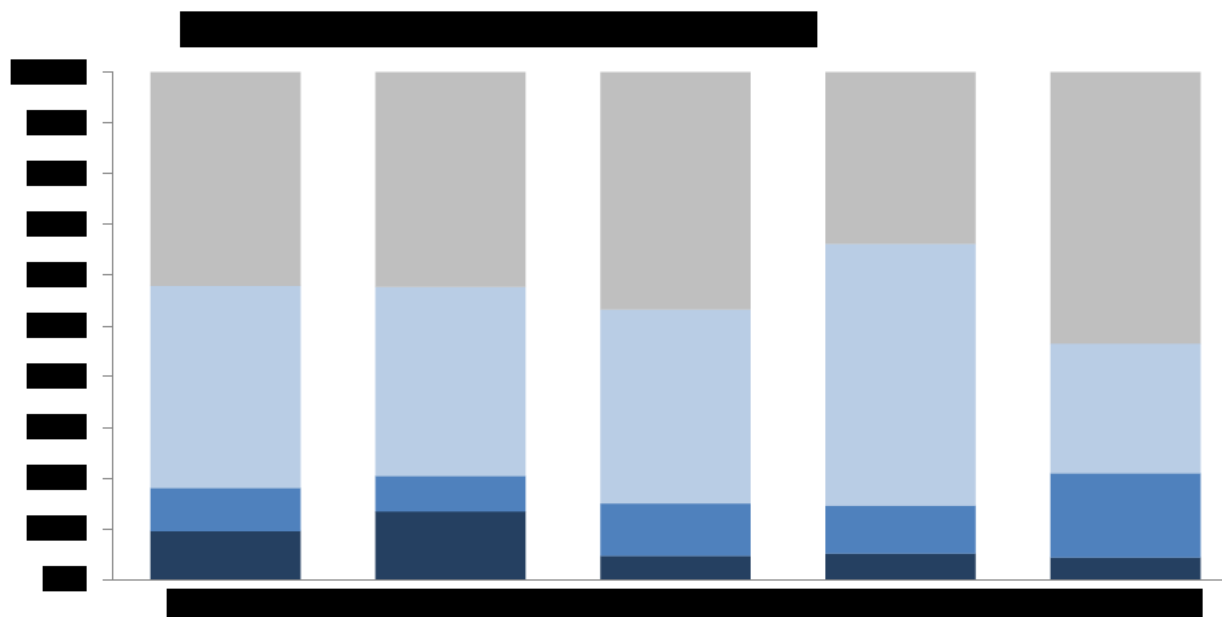
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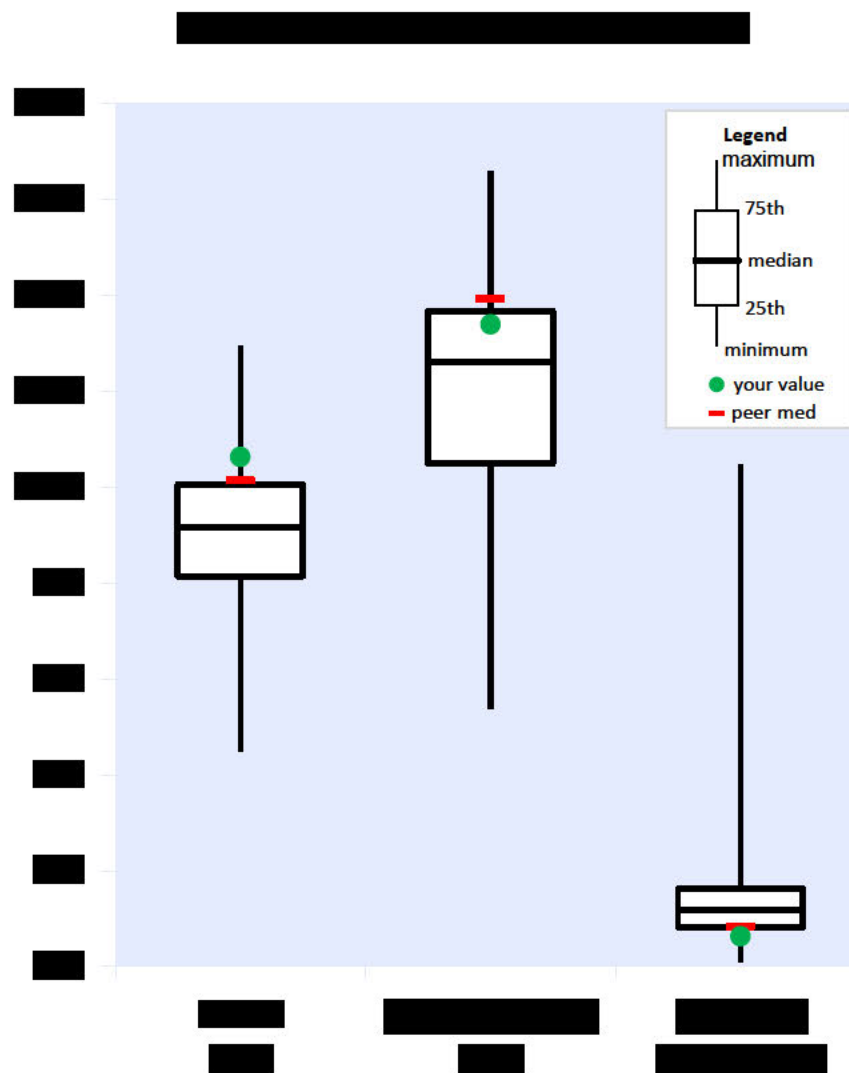
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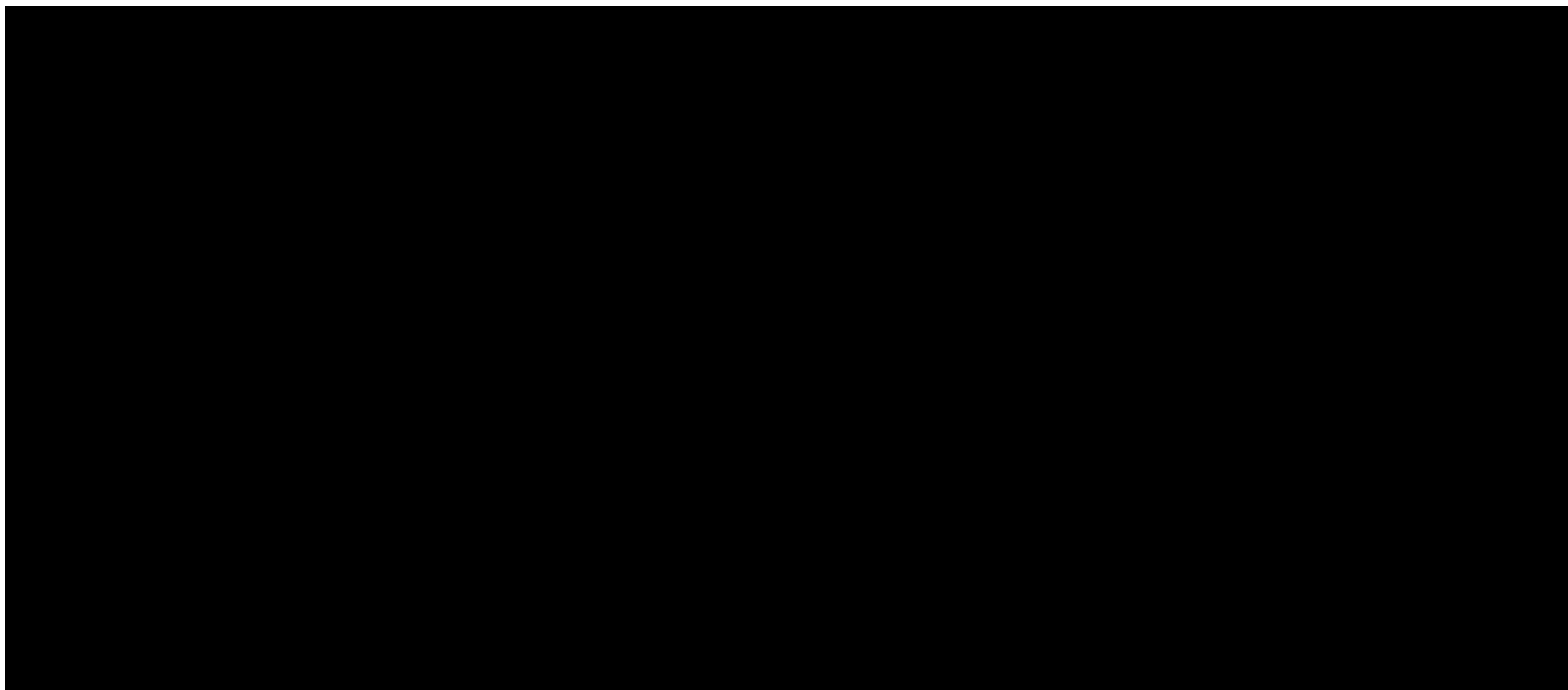


Risk versus return

Higher asset-liability risk was associated with positive changes in marked-to-market funded status.

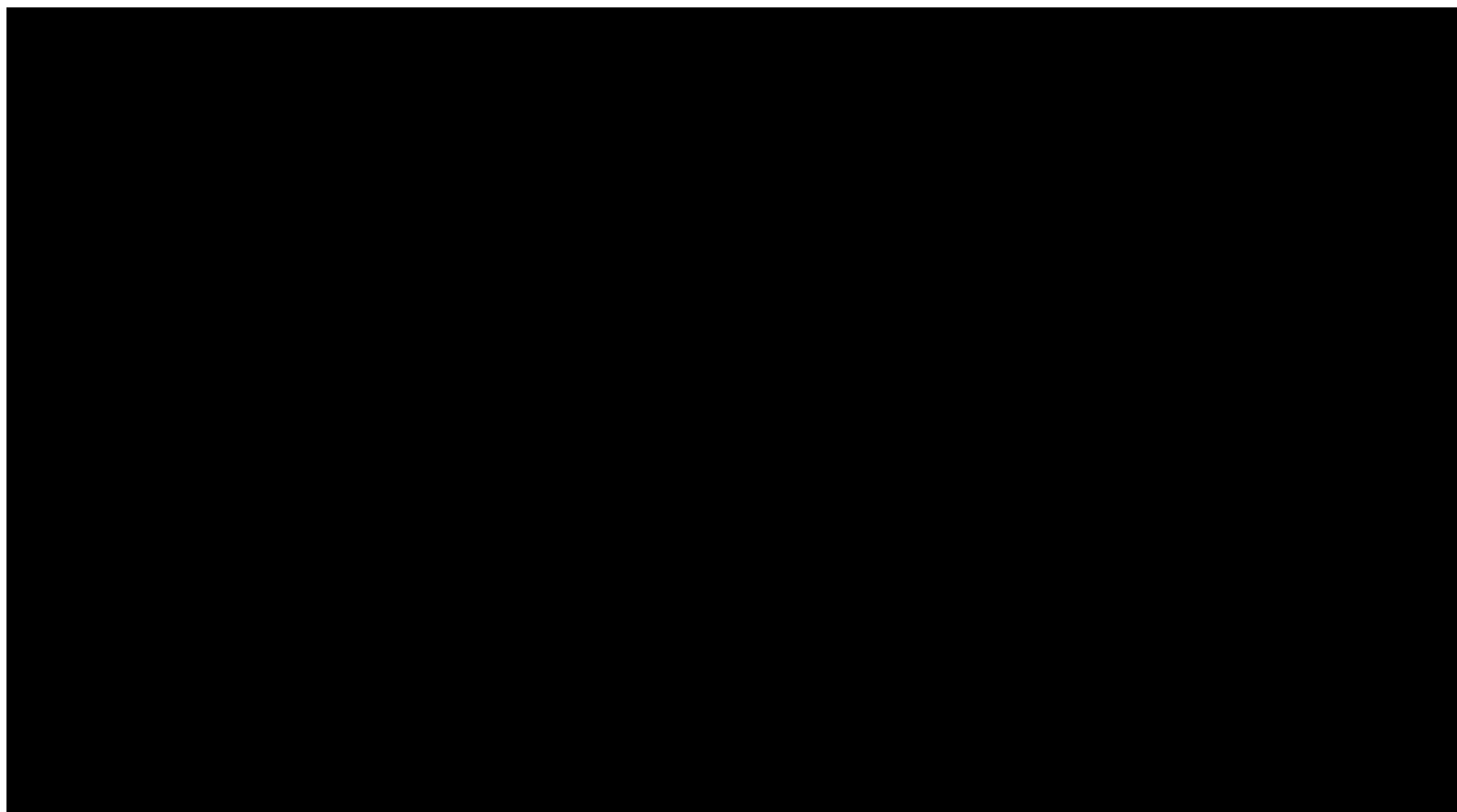
Higher asset risk was associated with higher policy returns.

There was no meaningful relationship between tracking error and net value added.



Impact of inflation sensitivity on policy asset mix decisions

One would expect plans with more inflation sensitivity to have more inflation hedging assets and fewer nominal bonds than plans with less inflation sensitivity. Although this is true, the difference is small: inflation hedging assets represent 12.7% of assets at plans with high inflation sensitivity versus 6.8% at plans with lower inflation sensitivity.



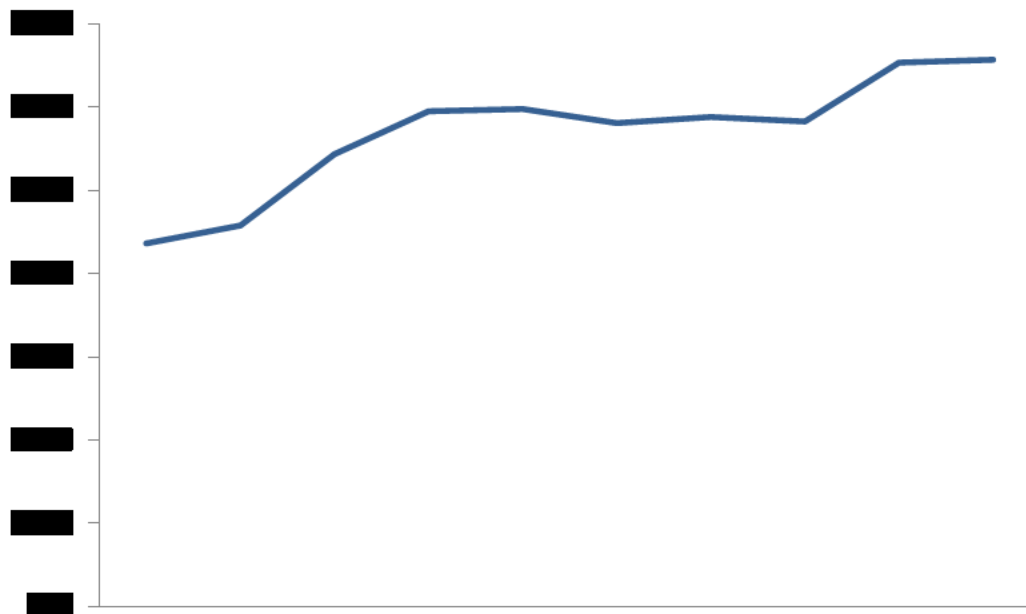
1. Inflation hedge assets include inflation-indexed bonds, commodities, real estate & REITs, infrastructure and natural resources.

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Country	2010	2011	2012	2013
Algeria	1.0	1.0	1.0	1.0
Angola	1.0	1.0	1.0	1.0
Argentina	1.0	1.0	1.0	1.0
Australia	1.0	1.0	1.0	1.0
Austria	1.0	1.0	1.0	1.0
Bahrain	1.0	1.0	1.0	1.0
Belgium	1.0	1.0	1.0	1.0
Brazil	1.0	1.0	1.0	1.0
Canada	1.0	1.0	1.0	1.0
Chile	1.0	1.0	1.0	1.0
China	1.0	1.0	1.0	1.0
Colombia	1.0	1.0	1.0	1.0
Costa Rica	1.0	1.0	1.0	1.0
Czechia	1.0	1.0	1.0	1.0
Denmark	1.0	1.0	1.0	1.0
Egypt	1.0	1.0	1.0	1.0
Ecuador	1.0	1.0	1.0	1.0
El Salvador	1.0	1.0	1.0	1.0
France	1.0	1.0	1.0	1.0
Germany	1.0	1.0	1.0	1.0
Ghana	1.0	1.0	1.0	1.0
Greece	1.0	1.0	1.0	1.0
Guatemala	1.0	1.0	1.0	1.0
Hong Kong	1.0	1.0	1.0	1.0
Hungary	1.0	1.0	1.0	1.0
India	1.0	1.0	1.0	1.0
Indonesia	1.0	1.0	1.0	1.0
Italy	1.0	1.0	1.0	1.0
Jamaica	1.0	1.0	1.0	1.0
Japan	1.0	1.0	1.0	1.0
Kenya	1.0	1.0	1.0	1.0
Korea	1.0	1.0	1.0	1.0
Lebanon	1.0	1.0	1.0	1.0
Libya	1.0	1.0	1.0	1.0
Lithuania	1.0	1.0	1.0	1.0
Luxembourg	1.0	1.0	1.0	1.0
Mexico	1.0	1.0	1.0	1.0
Morocco	1.0	1.0	1.0	1.0
Netherlands	1.0	1.0	1.0	1.0
New Zealand	1.0	1.0	1.0	1.0
Nigeria	1.0	1.0	1.0	1.0
Poland	1.0	1.0	1.0	1.0
Portugal	1.0	1.0	1.0	1.0
Qatar	1.0	1.0	1.0	1.0
Romania	1.0	1.0	1.0	1.0
Russia	1.0	1.0	1.0	1.0
Saudi Arabia	1.0	1.0	1.0	1.0
Senegal	1.0	1.0	1.0	1.0
Singapore	1.0	1.0	1.0	1.0
Slovakia	1.0	1.0	1.0	1.0
Slovenia	1.0	1.0	1.0	1.0
South Africa	1.0	1.0	1.0	1.0
Spain	1.0	1.0	1.0	1.0
Sweden	1.0	1.0	1.0	1.0
Switzerland	1.0	1.0	1.0	1.0
Taiwan	1.0	1.0	1.0	1.0
Tanzania	1.0	1.0	1.0	1.0
Togo	1.0	1.0	1.0	1.0
Turkey	1.0	1.0	1.0	1.0
Uganda	1.0	1.0	1.0	1.0
Ukraine	1.0	1.0	1.0	1.0
United Kingdom	1.0	1.0	1.0	1.0
United States	1.0	1.0	1.0	1.0
Uruguay	1.0	1.0	1.0	1.0
Venezuela	1.0	1.0	1.0	1.0
Zambia	1.0	1.0	1.0	1.0
Zimbabwe	1.0	1.0	1.0	1.0

3

Description of peer group and universe

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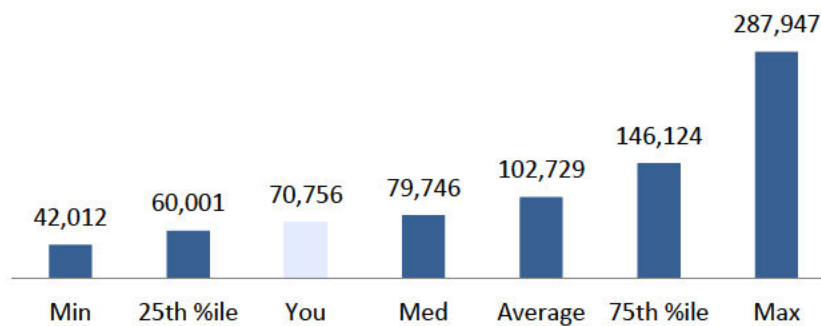
Peer group

Your peer group is comprised of 17 U.S. public funds, with assets ranging from \$42.0 billion to \$287.9 billion versus your \$70.8 billion. The median size is \$79.7 billion.

Your peer group is selected such that your fund size is usually close to the median of your peer group. Size is the primary criteria for choosing your peer group, because size greatly impacts how much you pay for services. Generally, the larger your fund, the smaller your unit operating costs (i.e., the economies of scale impact).

In order to preserve client confidentiality, we do not disclose your peers' names in this document due to the Freedom of Information Act.

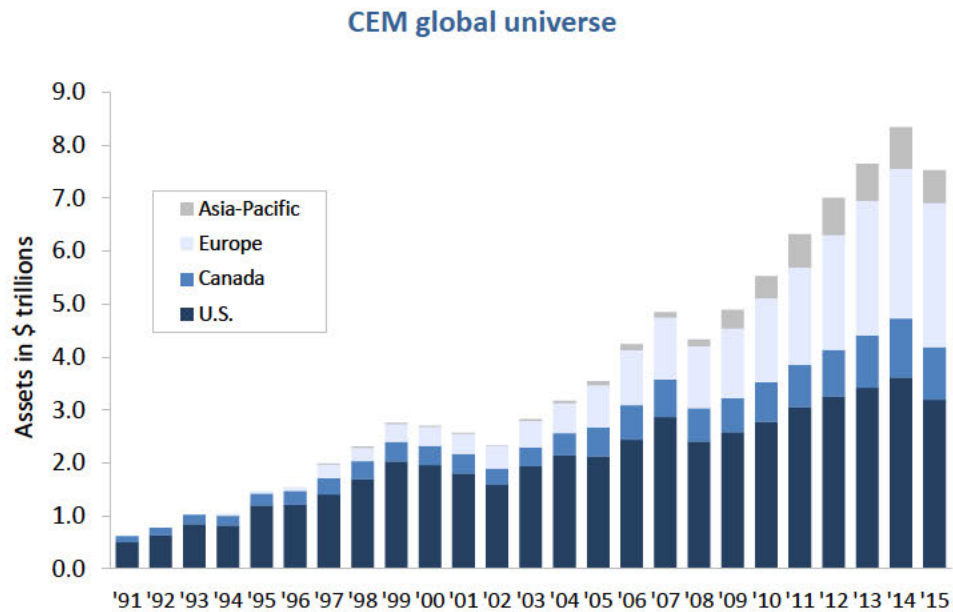
Total fund assets (\$ millions) - you versus peers



CEM global universe

CEM has been providing investment benchmarking solutions since 1991. The 2015 survey universe is comprised of 293 funds representing \$7.5 trillion in assets. The breakdown by region is as follows:

- 162 U.S. pension funds with aggregate assets of \$3.2 trillion.
- 72 Canadian pension funds with aggregate assets of \$996 billion.
- 52 European pension funds with aggregate assets of \$2.7 trillion. Included are funds from The Netherlands, Norway, Sweden, Finland, Denmark, Switzerland and the UK.
- 7 Asia-Pacific pension funds with aggregate assets of \$620 billion.



Universe subsets

CEM's global survey universe is comprised of 293 funds with total assets of \$7.5 trillion. Your fund's returns and costs are compared to the following two subsets of the global universe:

- **Peers** - Your peer group is comprised of 17 U.S. public funds ranging in size from \$42.0 - \$287.9 billion. The peer median of \$79.7 billion compares to your \$70.8 billion.
- **U.S. Public** - The U.S. Public universe is comprised of 55 funds ranging in size from \$1.2 - \$287.9 billion. The median fund is \$14.9 billion.

Universe subsets by number of funds and assets

		U.S. by type				Global by Country				
		Corp.	Public	Other	Total	U.S.	Canada	Europe	Asia-Pacific	Total
Peer group ¹										
# of funds										
2015	17	98	55	9	162	162	72	52	7	293
2014	17	98	63	13	174	174	88	143	9	414
2013	17	113	62	15	190	190	89	152	7	438
2012	17	121	66	14	201	201	88	144	12	445
2011	17	125	67	13	205	205	88	77	12	382
# of funds with uninterrupted data for:										
1 yr	17	98	55	9	162	162	72	52	7	293
2 yrs	17	89	50	9	148	148	67	42	5	262
3 yrs	17	82	46	8	136	136	63	41	5	245
4 yrs	17	77	46	8	131	131	59	31	5	226
5 yrs	17	75	44	8	127	127	53	26	5	211
6 yrs	15	70	41	8	119	119	52	23	4	198
Total assets (\$ billions)										
2015	1,746	947	2,168	81	3,195	3,195	996	2,721	620	7,533
2014	1,758	1,036	2,415	163	3,615	3,615	1,115	2,825	788	8,343
2013	1,659	1,050	2,415	163	3,424	3,424	985	2,545	697	7,651
2012	1,491	1,008	2,155	97	3,261	3,261	873	2,169	700	7,003
2011	1,389	964	2,025	65	3,054	3,054	804	1,838	625	6,321
2015 asset distribution (\$ billions)										
Avg	102.7	9.7	39.4	8.9	19.7	19.7	13.8	52.3	88.6	25.7
Max	287.9		287.9		287.9	287.9				
75th %ile	146.1		46.1		16.9	16.9				
Median	79.7		14.9		6.7	6.7				
25th %ile	60.0		5.5		2.7	2.7				
Min	42.0		1.2		0.5	0.5				

1. Peer group statistics are for your 2015 peer group only as your peer group may have included different funds in prior years.

Implementation style, actual mix and policy mix by universe subset

Implementation style, actual mix and policy mix - 2015
(as a % of year-end assets)

	Your fund	Peer group	U.S. by type				Global by Country				
			Corp.	Public	Other	Total	U.S.	Canada	Europe	Asia-Pacific	Total
<u>Implementation style</u>											
External active	28.2	53.2	75.6	62.8	66.3	70.8	70.8	67.3	44.0	47.8	64.6
Fund of funds	1.4	1.5	4.1	3.1	4.3	3.8	3.8	1.3	3.0	1.6	3.0
External passive	0.0	11.0	14.6	21.0	23.1	17.2	17.2	12.9	24.0	14.8	17.3
Internal active	56.5	19.8	3.5	7.5	0.0	4.7	4.7	15.0	25.5	28.9	11.5
Internal passive	<u>13.9</u>	<u>14.4</u>	<u>2.1</u>	<u>5.7</u>	<u>6.3</u>	<u>3.5</u>	<u>3.5</u>	<u>3.5</u>	<u>3.5</u>	<u>6.9</u>	<u>3.6</u>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<u>Actual asset mix</u>											
Stock	57.3	46.2	37.5	48.9	40.8	41.6	41.6	47.4	33.7	42.9	41.6
Fixed income	17.9	25.7	44.1	26.7	33.3	37.6	37.6	37.0	52.3	32.3	39.9
Global TAA	0.5	0.8	3.0	1.4	3.7	2.5	2.5	1.0	0.3	1.3	1.7
Real assets	12.4	11.9	5.1	10.1	10.5	7.1	7.1	10.0	8.6	17.8	8.4
Hedge funds	2.9	4.7	5.8	5.3	5.6	5.6	5.6	1.8	2.1	1.7	4.0
Private equity	<u>9.0</u>	<u>10.7</u>	<u>4.3</u>	<u>7.5</u>	<u>6.1</u>	<u>5.5</u>	<u>5.5</u>	<u>2.8</u>	<u>2.8</u>	<u>4.0</u>	<u>4.3</u>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0
<u>Policy asset mix</u>											
Stock	57.0	47.2	38.5	49.2	42.1	42.3	42.3	46.8	33.8	50.4	42.1
Fixed income	19.0	24.8	44.0	25.7	33.1	37.2	37.2	38.3	51.6	30.0	39.9
Global TAA	0.0	0.8	2.8	1.3	4.0	2.4	2.4	1.1	0.3	0.9	1.6
Real assets	10.0	12.3	4.7	10.7	11.0	7.1	7.1	10.3	9.5	15.1	8.5
Hedge funds	0.0	3.4	5.3	4.5	3.9	4.9	4.9	1.1	1.9	0.2	3.3
Private equity	<u>14.0</u>	<u>11.5</u>	<u>4.7</u>	<u>8.6</u>	<u>6.1</u>	<u>6.1</u>	<u>6.1</u>	<u>2.5</u>	<u>2.9</u>	<u>3.5</u>	<u>4.6</u>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Implementation style, actual mix and policy mix trends

Implementation style, actual mix and policy mix - 2011 to 2015
(as a % of year-end assets)

	Your fund					Peer average ¹					U.S. Public average ¹				
	2015	2014	2013	2012	2011	2015	2014	2013	2012	2011	2015	2014	2013	2012	2011
Implementation style															
External active	29.6	28.2	25.2	25.7	24.5	54.8	54.0	53.8	53.9	53.2	63.4	62.7	62.7	63.8	64.8
External passive	0.0	0.0	0.0	0.0	0.0	11.0	11.3	11.4	11.3	11.9	20.9	21.3	21.2	20.4	19.3
Internal active	56.5	58.4	62.7	63.0	62.0	19.8	20.3	20.4	20.8	21.3	9.1	9.4	9.4	9.1	9.3
Internal passive	<u>13.9</u>	<u>13.4</u>	<u>12.1</u>	<u>11.3</u>	<u>13.5</u>	<u>14.4</u>	<u>14.4</u>	<u>14.5</u>	<u>14.0</u>	<u>13.6</u>	<u>6.6</u>	<u>6.7</u>	<u>6.7</u>	<u>6.7</u>	<u>6.5</u>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Actual asset mix															
Stock	57.3	56.9	55.7	57.1	57.4	46.2	48.0	49.1	47.5	48.7	47.7	49.4	51.3	49.5	49.8
Fixed income	17.9	21.3	24.2	21.7	23.1	25.7	26.2	26.1	27.8	27.9	26.4	26.5	26.4	28.4	29.3
Global TAA	0.5	0.0	0.0	0.0	0.0	0.8	0.8	0.7	0.6	0.5	1.4	1.5	1.4	1.3	1.2
Real assets	12.4	10.5	9.8	10.9	8.9	11.9	10.5	9.9	9.9	9.2	10.4	9.2	8.3	8.1	7.5
Hedge funds	2.9	2.8	2.2	2.1	2.0	4.7	4.1	3.7	3.0	2.4	6.1	5.8	5.3	4.9	4.7
Private equity	<u>9.0</u>	<u>8.6</u>	<u>8.0</u>	<u>8.2</u>	<u>8.5</u>	<u>10.7</u>	<u>10.5</u>	<u>10.5</u>	<u>11.2</u>	<u>11.3</u>	<u>8.0</u>	<u>7.5</u>	<u>7.3</u>	<u>7.8</u>	<u>7.6</u>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Policy asset mix															
Stock	57.0	57.0	58.0	61.0	62.0	47.2	47.1	47.5	48.4	49.6	48.2	48.4	49.2	49.8	50.3
Fixed income	19.0	19.0	19.0	19.0	19.0	24.8	25.4	26.6	27.0	27.8	25.5	25.7	27.1	28.0	28.9
Global TAA	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.7	0.6	0.6	1.2	1.2	1.4	1.2	1.2
Real assets	10.0	10.0	10.0	10.0	10.0	12.3	11.5	11.2	11.0	9.9	11.0	10.7	9.6	9.3	8.4
Hedge funds	0.0	0.0	0.0	0.0	0.0	3.4	3.7	2.9	2.5	2.0	5.2	5.2	4.3	3.8	3.8
Private equity	<u>14.0</u>	<u>14.0</u>	<u>13.0</u>	<u>10.0</u>	<u>9.0</u>	<u>11.5</u>	<u>11.5</u>	<u>11.1</u>	<u>10.6</u>	<u>10.1</u>	<u>9.0</u>	<u>8.8</u>	<u>8.4</u>	<u>7.9</u>	<u>7.5</u>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1. Trends are based on the 44 U.S. Public and 17 peer funds with 5 consecutive years of data ending 2015.

Implementation style by asset class

Implementation style impacts your costs, because external active management tends to be more expensive than internal or passive (or indexed) management and fund-of-funds usage is more expensive than direct fund investment.

Implementation style by asset class - 2015 (as a % of average assets)

	Your fund %					Peer average %					U.S. Public average %				
	External			Internal		External			Internal		External			Internal	
	Active	FOFs	Index	Active	Index	Active	FOFs	Index	Active	Index	Active	FOFs	Index	Active	Index
U.S. Stock - Broad/All						17.2		24.3	8.9	49.6	17.5		62.7	3.0	16.8
U.S. Stock - Large Cap	4.8		0.0	52.7	42.4	16.4		24.5	20.8	38.3	36.4		41.5	5.9	16.2
U.S. Stock - Mid Cap						46.6		7.8	23.4	22.2	69.0		14.4	4.6	12.0
U.S. Stock - Small Cap	58.0		0.0	42.0	0.0	59.5		15.1	15.3	10.0	82.9		9.3	4.3	3.5
Stock - EAFE	50.2		0.0	49.8	0.0	48.3		24.0	9.4	18.2	57.3		29.2	4.6	8.9
Stock - ACWIxU.S.	28.5		0.0	71.5	0.0	63.7		30.9	5.3	0.0	61.2		38.0	0.8	0.0
Stock - Emerging	35.2		0.0	64.8	0.0	68.7		14.1	7.1	10.0	79.3		13.8	2.8	4.0
Stock - Global	0.0		0.0	100.0	0.0	75.2		3.5	19.9	1.5	67.6		22.1	5.4	5.0
Stock - Other						18.5		6.9	35.7	38.8	80.1		7.6	5.9	6.4
Total Stock	24.0		0.0	54.9	21.1	39.5		21.5	13.9	25.1	50.9		35.4	4.1	9.6
Fixed Income - U.S.	0.0		0.0	100.0	0.0	28.8		4.2	55.7	11.3	62.3		14.3	19.9	3.4
Fixed Income - U.S. Gov't						87.9		0.0	0.0	12.1	20.1		77.1	0.0	2.8
Fixed Income - U.S. Credit						100.0		0.0	0.0	0.0	57.3		42.7	0.0	0.0
Fixed Income - Long Bonds						0.0		0.0	100.0	0.0	98.8		0.0	1.2	0.0
Fixed Income - EAFE						59.5		0.0	40.5	0.0	85.7		0.0	14.3	0.0
Fixed Income - Emerging	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0
Fixed Income - Global						22.1		0.0	77.9	0.0	70.9		0.0	29.1	0.0
Fixed Income - Inflation Indexed						24.4		15.5	28.9	31.3	45.5		29.5	11.1	13.8
Fixed Income - High Yield	100.0		0.0	0.0	0.0	97.0		0.0	3.0	0.0	95.8		3.3	0.8	0.0
Fixed Income - Mortgages						10.1		2.0	80.9	7.0	38.7		1.3	55.2	4.8
Fixed Income - Private Debt						65.6		0.0	34.4	0.0	90.5		0.0	9.5	0.0
Fixed Income - Other						86.3		0.7	7.4	5.6	90.8		0.4	5.1	3.8
Cash	0.0		0.0	100.0	0.0	23.0		0.0	77.0	0.0	41.9		0.0	58.1	0.0
Total Fixed Income	13.3		0.0	86.7	0.0	38.8		3.7	47.9	9.6	64.9		12.7	19.3	3.1
Commodities						74.8		0.0	11.8	13.4	89.1		1.5	4.4	5.0
Infrastructure	0.0	100.0	n/a	0.0	n/a	85.9	8.4	n/a	5.7	n/a	93.6	4.8	n/a	1.6	n/a
Natural Resources	48.6	0.0	n/a	51.4	n/a	92.7	0.0	n/a	7.3	n/a	98.0	0.0	n/a	2.0	n/a
REITs	0.0	0.0	0.0	0.0	100.0	72.6	0.0	0.0	6.0	21.3	81.2	0.0	10.6	1.3	6.9
Real Estate ex-REITs	15.8	0.0	n/a	84.2	n/a	91.7	0.1	n/a	8.2	0.0	93.4	2.7	n/a	3.9	0.0
Other Real Assets			n/a		n/a	100.0	0.0	n/a	0.0	n/a	100.0	0.0	n/a	0.0	n/a
Total Real Assets	18.0	0.0	0.0	68.6	13.4	90.6	0.0	0.0	7.6	1.8	94.9	0.0	1.1	3.2	0.9
Hedge Funds	100.0	0.0	n/a	0.0	n/a	83.9	16.1	n/a	0.0	n/a	70.2	29.8	n/a	0.0	n/a
Global TAA	100.0	0.0	n/a	0.0	n/a	91.8	0.0	n/a	8.2	n/a	98.7	0.0	n/a	1.3	n/a
Diversified Private Equity	100.0	0.0	n/a	0.0	n/a	92.6	7.0	n/a	0.4	n/a	78.5	21.3	n/a	0.2	n/a
Venture Capital	84.2	15.8	n/a	0.0	n/a	73.5	26.5	n/a	0.0	n/a	81.1	18.9	n/a	0.0	n/a
LBO	81.8	18.2	n/a	0.0	n/a	96.8	3.2	n/a	0.0	n/a	97.8	2.2	n/a	0.0	n/a
Other Private Equity	86.2	0.0	n/a	13.8	n/a	95.6	0.0	n/a	4.4	n/a	98.2	0.0	n/a	1.8	n/a
Total Private Equity	86.7	11.2	n/a	2.1	n/a	93.3	6.3	n/a	0.4	n/a	85.4	14.5	n/a	0.2	n/a
Total Fund - Avg. Holdings	27.7	1.2	0.0	57.5	13.6	53.0	1.3	11.1	19.9	14.6	62.7	2.9	21.1	7.5	5.7
Total Fund - Yr.-End Holdings	28.2	1.4	0.0	56.5	13.9	53.2	1.5	11.0	19.8	14.4	62.8	3.1	21.0	7.5	5.7

Actual mix

Actual asset mix - 2011 to 2015
(as a % of year-end assets)

	Your fund %					Peer average %					U.S. Public average %				
	2015	2014	2013	2012	2011	2015	2014	2013	2012	2011	2015	2014	2013	2012	2011
Employer Stock															
U.S. Stock - Broad/All						6.8	6.9	8.2	7.0	7.8	6.1	6.9	9.7	7.3	7.1
U.S. Stock - Large Cap	28.2	28.6	28.5	30.9	33.4	14.1	14.5	13.1	13.8	14.6	15.4	15.4	13.8	15.0	14.7
U.S. Stock - Mid Cap						0.6	0.7				1.0	0.8	0.1	0.1	0.1
U.S. Stock - Small Cap	2.7	2.7	2.8	3.6	3.5	2.5	2.8	3.6	3.5	3.5	3.0	3.1	4.2	4.4	4.6
Stock - EAFE	15.8	15.5	15.7	16.9	16.3	10.2	10.1	10.8	10.2	10.4	6.4	6.6	7.7	7.1	7.7
Stock - ACWIxU.S.	5.6	5.1	3.9			4.1	4.5	4.8	4.7	4.8	9.0	8.6	9.0	8.2	6.4
Stock - Emerging	3.9	3.9	3.8	4.8	4.2	3.7	3.8	3.9	4.1	3.6	2.8	3.2	3.1	3.4	2.9
Stock - Global	1.1	1.1	1.1	0.9		3.7	4.1	4.0	3.6	3.3	4.4	4.1	3.9	3.8	4.3
Stock - Other						0.5	0.6	0.8	0.7	0.6	0.9	1.1	0.7	0.5	0.5
Total Stock	57.3	56.9	55.7	57.1	57.4	46.2	48.0	49.1	47.5	48.7	48.9	49.7	52.2	49.9	48.2
Fixed Income - U.S.	13.7	15.0	17.3	14.6	15.1	14.1	14.5	14.9	16.9	17.7	15.3	14.4	15.7	17.6	18.4
Fixed Income - U.S. Gov't						0.5	0.4				0.7	0.1			
Fixed Income - U.S. Credit						0.1	0.2				0.1	0.1			
Fixed Income - Long Bonds						0.0	0.0	0.0	0.0	0.0	0.8	1.0	0.5	0.2	0.3
Fixed Income - EAFE						0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2
Fixed Income - Emerging	1.0	1.2	1.0	0.9	0.8	1.0	0.9	0.6	0.6	0.4	0.9	0.9	0.8	0.8	0.6
Fixed Income - Global						1.9	2.3	2.9	2.3	2.0	1.6	1.9	1.9	2.2	2.0
Fixed Income - Inflation Indexed						2.2	2.1	2.0	2.0	2.2	1.8	1.8	1.7	2.0	2.2
Fixed Income - High Yield	1.3	1.7	1.2	1.2	1.3	1.3	1.3	1.2	1.6	1.8	1.4	1.6	1.6	2.0	2.2
Fixed Income - Mortgages						0.4	0.4	0.4	0.5	0.6	0.2	0.2	0.2	0.2	0.3
Fixed Income - Private Debt						0.5	0.5	0.4	0.3	0.0	0.6	0.5	0.1	0.2	0.0
Fixed Income - Other						1.4	1.3	1.2	0.9	1.0	1.0	1.0	0.7	0.6	0.7
Cash	1.8	3.4	4.8	4.9	5.9	2.1	2.1	2.4	2.5	2.1	2.3	2.4	2.6	1.9	1.9
Total Fixed Income	17.9	21.3	24.2	21.7	23.1	25.7	26.2	26.1	27.8	27.9	26.7	26.2	26.1	27.9	28.8
Commodities						0.4	0.6	0.6	0.5	0.5	0.4	0.6	0.5	0.5	0.6
Infrastructure	0.1	0.1	0.1	0.1		0.3	0.2	0.2	0.1	0.0	0.3	0.3	0.2	0.4	0.5
Natural Resources	1.3	0.5	0.4	0.6		0.5	0.4	0.2	0.2	0.1	0.6	0.6	0.4	0.4	0.3
REITs	1.6	1.5	1.3	1.5	1.3	0.7	0.6	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.8
Real Estate ex-REITs	9.3	8.4	7.9	8.7	7.6	9.2	8.4	8.0	8.2	7.8	7.3	6.3	6.1	6.3	6.2
Other Real Assets						0.8	0.3	0.2	0.2	0.1	0.7	0.6	0.4	0.3	0.3
Total Real Assets	12.4	10.5	9.8	10.9	8.9	11.9	10.5	9.9	9.9	9.2	10.1	9.2	8.3	8.5	8.6
Hedge Funds	2.9	2.8	2.2	2.1	2.0	4.7	4.1	3.7	3.0	2.4	5.3	5.3	5.1	4.7	5.2
Global TAA	0.5					0.8	0.8	0.7	0.6	0.5	1.4	2.2	1.2	1.4	1.4
Div. Private Equity	0.1	4.6	4.6	5.0	6.4	7.6	7.8	8.4	9.0	9.2	5.6	5.2	5.3	5.8	5.9
Venture Capital	1.6	1.4	1.2	1.3	1.3	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
LBO	4.5					2.1	1.9	1.4	1.6	1.6	1.3	1.4	1.1	1.1	1.2
Other Private Equity	2.7	2.5	2.2	1.9	0.8	0.5	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.4	0.5
Total Private Equity	9.0	8.6	8.0	8.2	8.5	10.7	10.5	10.5	11.2	11.3	7.5	7.3	7.1	7.6	7.8
Total Fund	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Count	1	1	1	1	1	17	17	17	17	17	55	63	62	66	67
Median Assets (\$ billions)	70.8	73.7	72.3	65.8	61.7	79.7	78.4	73.5	65.8	61.7	14.9	16.2	15.4	14.0	12.8

Policy mix

Policy asset mix - 2011 to 2015
(as a % of average assets)

	Your fund %					Peer average %					U.S. Public average %				
	2015	2014	2013	2012	2011	2015	2014	2013	2012	2011	2015	2014	2013	2012	2011
Employer Stock															
U.S. Stock - Broad/All						14.4	12.0	12.4	14.0	16.3	10.0	9.6	11.6	11.2	12.0
U.S. Stock - Large Cap	31.0	31.0	33.0	38.0	39.0	4.3	6.3	6.7	5.9	6.1	10.7	11.5	9.7	11.2	10.1
U.S. Stock - Mid Cap							0.2				0.4	0.3	0.1	0.0	0.0
U.S. Stock - Small Cap						0.3	0.5	1.2	1.1	1.2	1.6	1.6	2.2	2.7	3.0
Stock - EAFE	20.8	20.8	20.0	18.4	18.4	6.5	6.8	8.6	6.7	7.8	4.8	5.2	6.9	6.7	6.4
Stock - ACWIxU.S.						5.3	4.9	4.0	6.6	6.8	10.0	9.7	8.1	9.1	9.2
Stock - Emerging	5.2	5.2	5.0	4.6	4.6	1.5	1.6	2.6	1.8	2.1	1.9	2.0	2.0	2.0	2.2
Stock - Global						14.5	14.5	11.7	12.1	8.9	8.9	7.8	8.5	6.4	6.3
Stock - Other						0.4	0.4	0.3	0.4	0.3	0.8	0.7	0.5	0.2	0.1
Total Stock	57.0	57.0	58.0	61.0	62.0	47.2	47.1	47.5	48.4	49.6	49.2	48.4	49.6	49.5	49.2
Fixed Income - U.S.	18.0	18.0	18.0	18.0	18.0	17.5	16.3	17.0	17.5	19.9	17.4	16.1	18.5	19.3	20.5
Fixed Income - U.S. Gov't						0.0					0.0				
Fixed Income - U.S. Credit											0.1				
Fixed Income - Long Bonds											1.5	1.6	0.9	0.2	0.3
Fixed Income - EAFE								0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2
Fixed Income - Emerging						0.8	0.6	0.5	0.5	0.4	0.8	0.8	0.7	0.8	0.7
Fixed Income - Global						1.8	2.8	2.6	2.5	1.3	1.6	2.0	1.4	2.1	1.4
Fixed Income - Inflation Indexed						1.9	2.3	2.6	2.5	2.5	2.8	2.7	2.6	1.8	2.2
Fixed Income - High Yield						1.2	1.4	1.5	1.6	1.7	1.7	1.8	2.1	1.9	1.9
Fixed Income - Mortgages						0.1	0.1	0.1	0.1		0.1	0.0	0.0	0.0	0.0
Fixed Income - Private Debt						0.4	0.4	0.2	0.0		0.5	0.5	0.1	0.0	
Fixed Income - Other						0.7	0.7	1.2	1.3	1.0	0.5	0.7	0.7	0.7	0.4
Cash	1.0	1.0	1.0	1.0	1.0	0.4	0.9	0.9	0.9	1.0	-1.3	-0.9	-0.2	0.7	0.9
Total Fixed Income	19.0	19.0	19.0	19.0	19.0	24.8	25.4	26.6	27.0	27.8	25.7	25.4	27.0	27.6	28.5
Commodities						0.6	0.6	0.6	0.7	0.7	1.0	1.1	0.9	0.7	0.7
Infrastructure						0.2	0.2	0.2	0.3	0.1	0.4	0.4	0.4	0.6	0.5
Natural Resources						0.4	0.4	0.4	0.2	0.1	0.6	0.5	0.7	0.5	0.5
REITs	1.5	1.5	1.5	1.5		0.5	0.8	0.8	0.9	0.6	0.7	0.7	0.7	0.7	0.5
Real Estate ex-REITs	8.5	8.5	8.5	8.5	10.0	9.4	8.9	8.6	8.2	8.1	7.0	7.1	6.6	6.6	6.8
Other Real Assets						1.3	0.5	0.5	0.6	0.3	1.0	0.9	0.5	0.6	0.3
Total Real Assets	10.0	10.0	10.0	10.0	10.0	12.3	11.5	11.2	11.0	9.9	10.7	10.7	9.8	9.6	9.3
Hedge Funds						3.4	3.7	2.9	2.5	2.0	4.5	5.0	4.1	3.9	4.1
Global TAA						0.8	0.8	0.7	0.6	0.6	1.3	2.1	1.3	1.4	1.2
Div. Private Equity		14.0	13.0	10.0	9.0	9.0	10.4	10.1	9.8	9.1	7.3	7.1	6.8	6.7	6.4
Venture Capital						0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.1
LBO	14.0					2.1	0.7	0.8	0.7	0.6	0.9	0.7	0.8	0.8	0.7
Other Private Equity						0.2	0.2	0.0	0.0	0.3	0.2	0.4	0.3	0.3	0.4
Total Private Equity	14.0	14.0	13.0	10.0	9.0	11.5	11.5	11.1	10.6	10.1	8.6	8.5	8.2	8.0	7.6
Total Fund	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Count	1	1	1	1	1	17	17	17	17	17	55	63	62	66	67

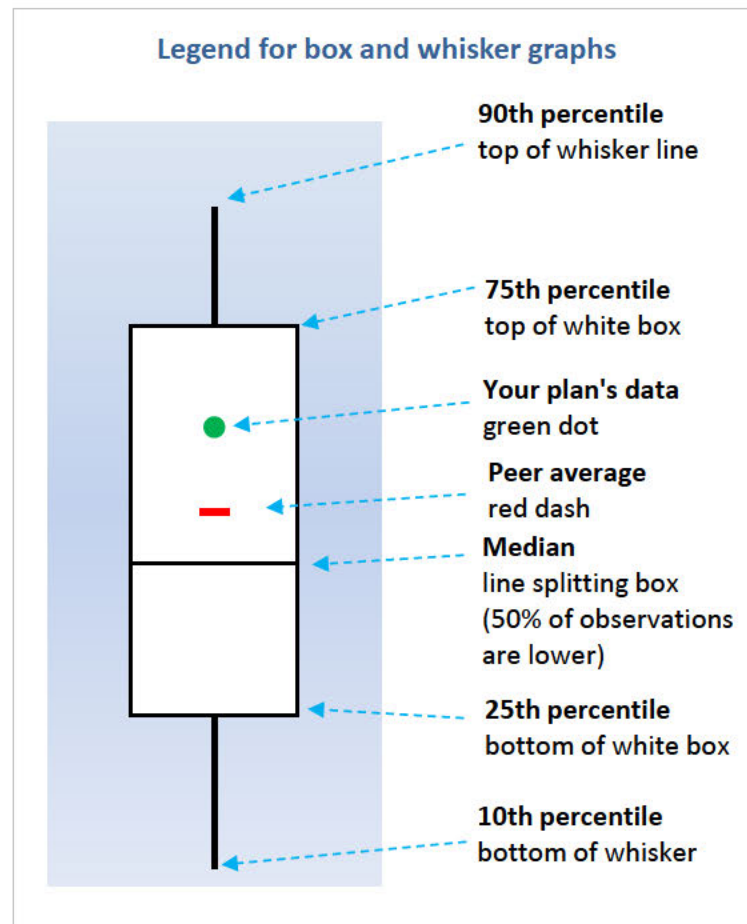
4

Returns, Benchmarks and Value Added

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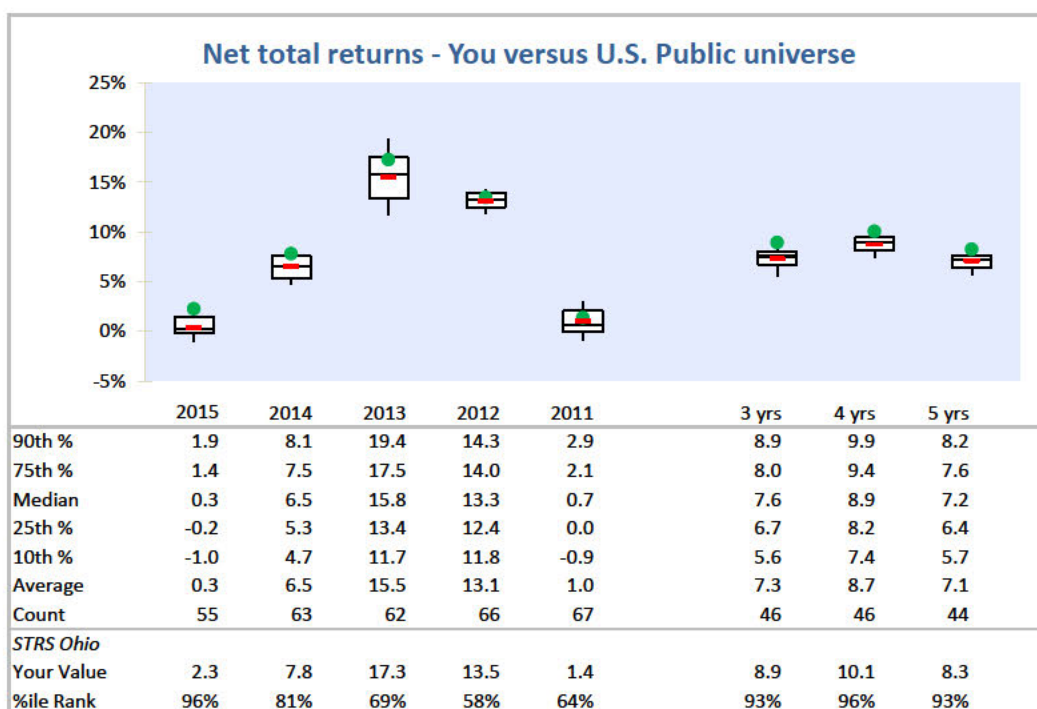
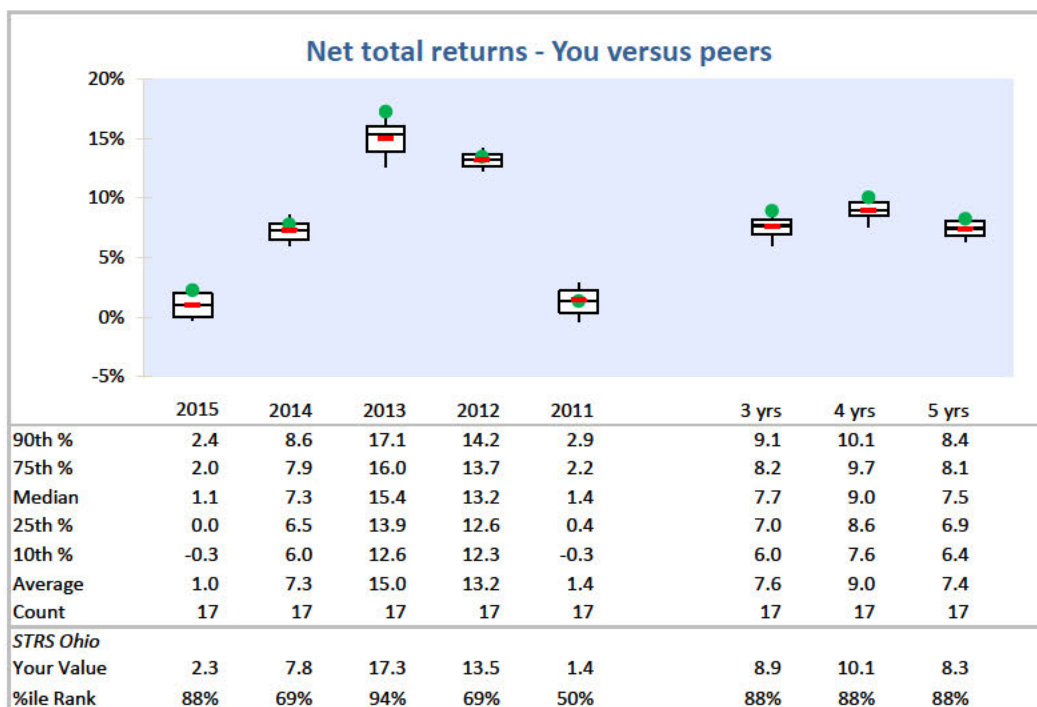
Interpreting box and whisker graphs

Box and whisker graphs are used extensively in this report because they show visually where you rank relative to all observations. At a glance you can see which quartile your data falls in.



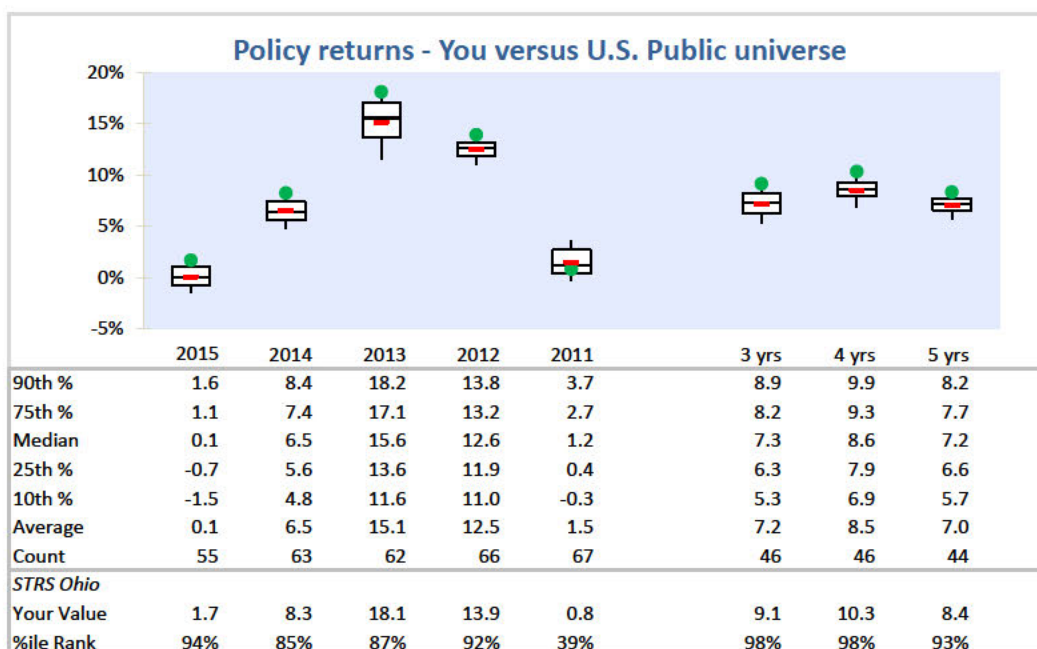
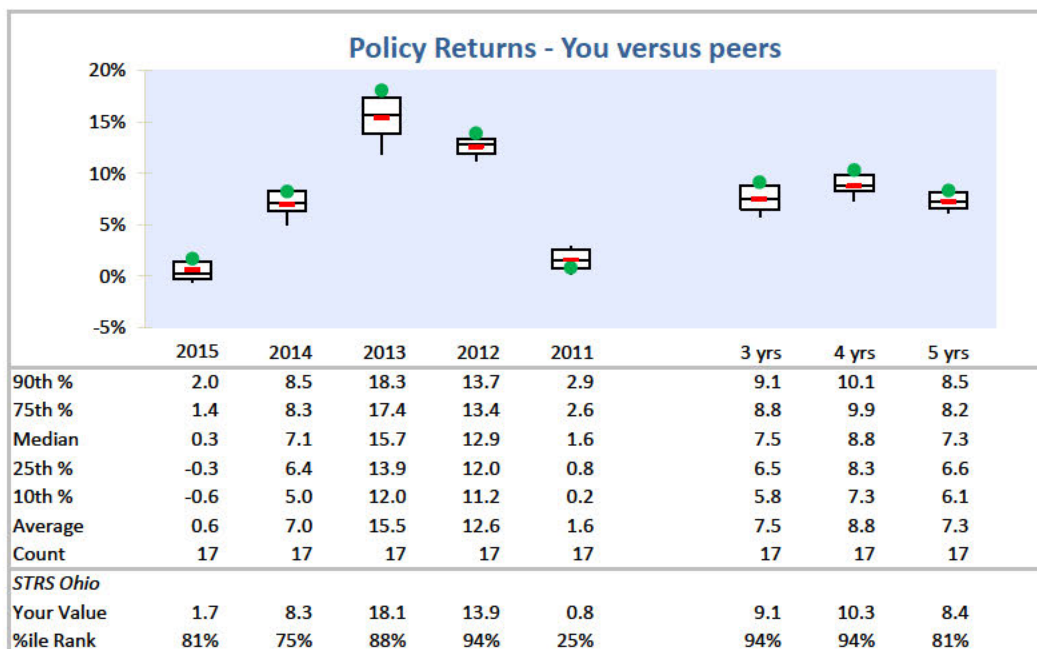
Net total returns

Your 5-year net total return of 8.3% was among the highest in your peer group and among the highest in the U.S. Public universe. Comparisons of total return do not help you understand the reasons behind relative performance. To understand the relative contributions from policy asset mix decisions and implementation decisions we separate total return into its more meaningful components - policy return and implementation value added.



Policy returns

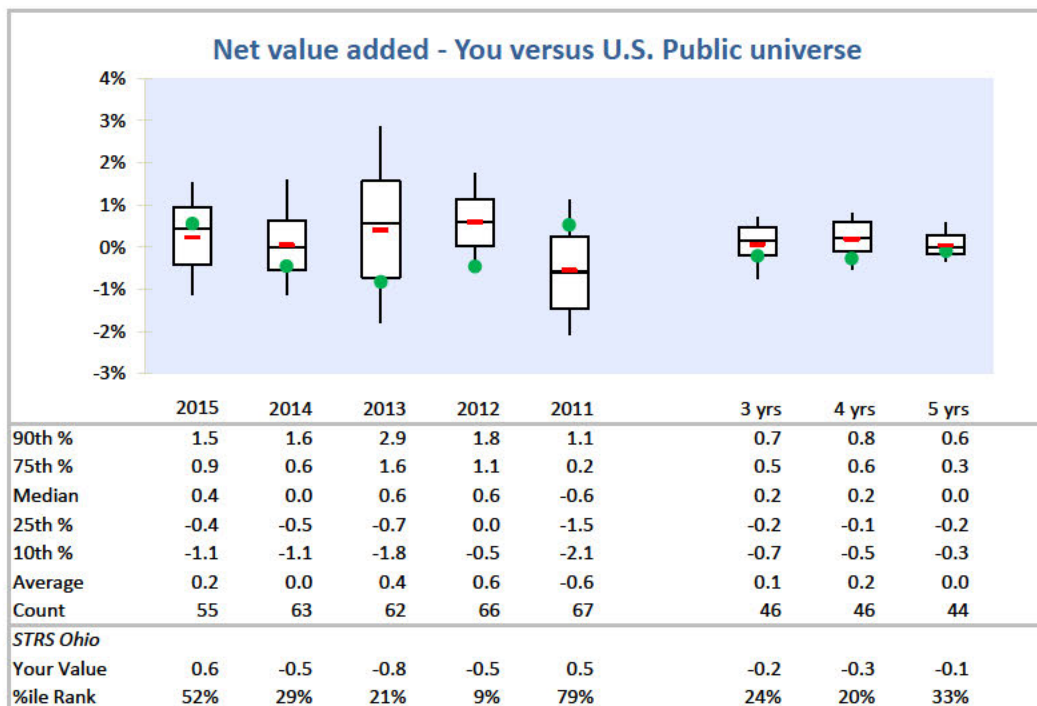
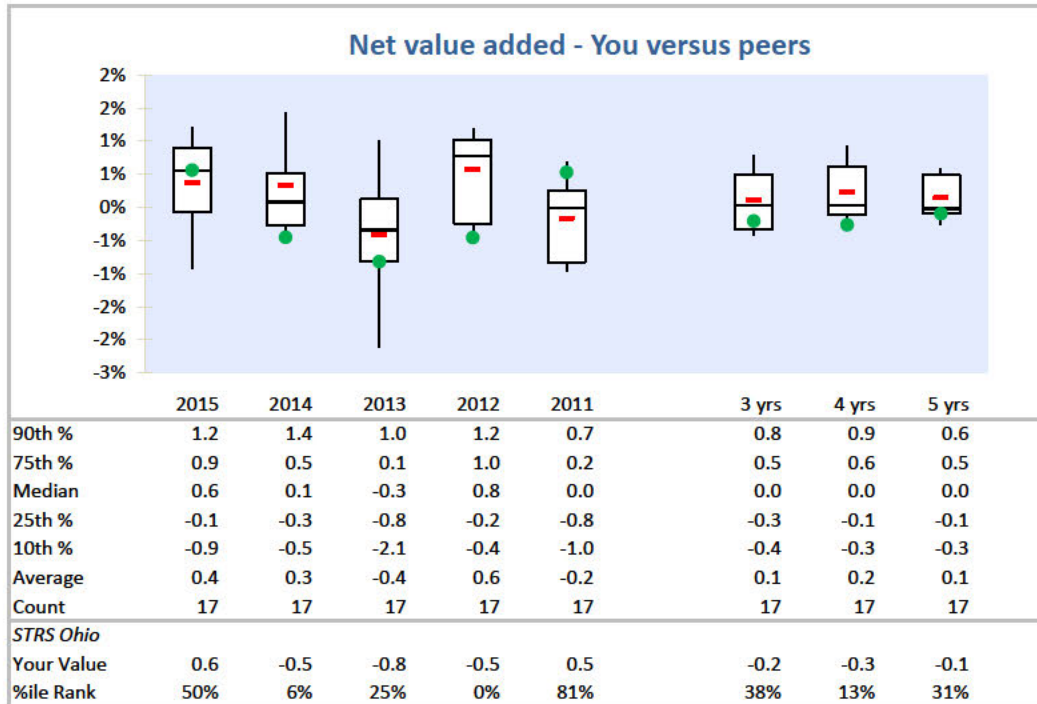
Your 5-year policy return of 8.4% was among the highest in your peer group and among the highest in the U.S. Public universe. Policy return is the return you would have earned had you passively implemented your policy asset mix decision through your benchmark portfolios.



To enable fairer comparisons, the policy returns of all participants except your fund were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. If CEM used this same adjustment for your fund, your 5-year policy return would be 8.6%, 0.2% higher than your actual 5-year policy return of 8.4%. Mirroring this, your 5-year total fund net value added would be 0.2% lower. Refer to the Research section pages 6-7 for details.

Net value added

Your 5-year net value added of -0.1% was below the peer median and below the median of the U.S. Public universe. Net value added is the difference between your net total return and your policy return.



Net returns by asset class

Asset class	Your fund %						Peer average %						U.S. Public average %					
	2015	2014	2013	2012	2011	5-yr	2015	2014	2013	2012	2011	5-yr	2015	2014	2013	2012	2011	5-yr
U.S. Stock - Broad/All							0.0	10.7	34.0	16.3	0.3	11.6	0.3	11.1	33.4	16.2	0.7	11.7
U.S. Stock - Large Cap	1.0	12.4	31.1	15.6	1.9	11.9	1.3	12.9	33.1	16.0	2.1	12.5	1.0	12.6	33.6	16.2	1.3	12.3
U.S. Stock - Mid Cap							-2.1	8.9					-2.4	8.1	37.2	16.3	1.3	11.3
U.S. Stock - Small Cap	-2.2	4.3	42.2	14.6	-2.8	10.1	-3.1	5.7	39.6	16.4	-3.0	10.1	-3.3	5.2	38.9	16.0	-3.4	9.6
Stock - EAFE	3.5	1.1	25.3	16.3	-12.4	6.0	-0.2	-3.4	23.6	17.7	-11.9	4.3	0.4	-3.8	23.3	17.3	-12.0	4.2
Stock - Emerging	-12.0	-1.7	-1.3	20.0	-15.3	-2.8	-14.0	-1.0	-2.4	19.2	-18.2	-4.1	-14.2	-1.5	-1.5	18.8	-19.4	-4.4
Stock - ACWIxU.S.	-0.9	0.4	17.6				-2.5	-2.7	17.9	17.8	-13.6	2.6	-2.4	-3.5	18.8	17.8	-12.3	2.9
Stock - Global	-1.3	3.7	24.5	16.1			-0.9	4.9	26.0	16.4	-7.1	7.2	-1.6	3.8	24.1	15.1	-7.2	6.3
Stock - Other							-5.6	3.3	15.7	13.1	-9.7	2.9	-5.5	5.1	18.7	12.3	-6.7	4.3
Stock - Total	0.4	6.8	27.0	16.1	-3.8	8.7	-1.3	5.4	26.3	16.9	-5.3	7.8	-1.5	5.0	26.6	16.9	-5.2	7.7
Fixed Income - U.S.	1.0	5.5	-1.6	4.6	7.4	3.3	0.5	7.0	-2.2	6.5	8.7	4.0	0.3	5.8	-1.6	6.9	8.4	3.9
Fixed Income - U.S. Gov't							0.6	1.0					0.7	1.0				
Fixed Income - U.S. Credit							-1.9	4.4					-2.2	6.3				
Fixed Income - EAFE							-4.3	-3.0	-5.2	0.2	7.3	-1.1	-4.9	-2.6	-3.1	0.9	6.4	-0.8
Fixed Income - Emerging	0.6	1.5	-4.8	18.6	4.9	3.9	-2.1	-0.3	-6.3	17.5	2.6	2.0	-4.4	-0.5	-7.4	16.6	1.0	0.7
Fixed Income - Global							-1.2	3.9	0.7	5.8	4.6	2.7	-2.0	3.0	-0.4	8.2	5.2	2.7
Fixed Income - Long Bonds							-3.4	7.7	4.7	22.0	13.9	8.6	-3.8	22.3	-5.0	10.2	28.3	9.6
Fixed Income - Inflation Indexed							-1.8	4.2	-7.4	7.7	12.8	2.9	-1.6	4.8	-7.3	7.7	13.2	3.1
Fixed Income - High Yield	-4.5	2.1	8.2	14.9	6.0	5.1	-3.1	2.9	7.2	15.0	4.3	5.1	-3.4	3.2	7.1	15.7	3.7	5.1
Fixed Income - Mortgages							3.5	7.9	4.8	8.8	6.4	6.2	3.5	6.4	5.0	11.9	3.6	6.0
Fixed Income - Private Debt							1.3	4.9	6.2	8.4	0.0	4.1	1.1	1.6	6.8	9.0	3.5	4.4
Fixed Income - Other							-0.8	4.7	6.7	10.0	1.5	4.4	-0.8	4.9	7.8	13.1	1.9	5.3
Cash	0.1	0.1	0.1	0.1	0.2	0.1	0.7	0.4	0.3	1.0	3.4	1.1	0.3	0.3	0.1	0.6	1.3	0.5
Fixed Income - Total	0.4	4.1	-0.8	4.7	5.4	2.7	-0.2	5.3	-1.1	7.3	7.4	3.7	-0.4	5.4	-1.1	7.9	7.1	3.7
Commodities							-23.2	-17.1	-6.0	-1.7	-6.0	-11.2	-22.3	-16.9	-5.4	0.2	-7.8	-10.8
Infrastructure	5.3	17.5	3.5	28.6			4.0	23.6	7.7	7.7	-15.1	4.8	5.3	12.8	9.8	6.4	1.9	7.2
REITs	3.2	30.5	1.8	17.8	9.3	12.1	3.2	19.4	5.0	25.0	-0.6	10.0	2.1	19.6	4.2	21.1	2.0	9.5
Natural Resources	2.0	7.7	7.5	-23.0			-4.4	8.5	9.2	-1.5	3.6	2.9	-2.6	11.0	6.6	1.8	3.1	3.9
Real Estate ex-REITs	12.2	14.8	11.2	14.2	20.0	14.4	13.3	14.1	12.7	10.9	15.4	13.2	13.1	12.5	12.4	10.4	13.5	12.4
Other Real Assets							-6.3	5.1	1.2	1.1	5.7	1.3	-12.4	6.9	11.6	4.1	2.7	2.2
Real Assets - Total	10.2	16.1	9.7	14.6	18.2	13.7	9.9	12.9	10.7	11.2	12.6	11.4	8.3	11.3	10.5	10.1	10.1	10.1
Hedge Funds	-2.3	1.5	9.8	5.8	-2.4	2.4	-0.3	4.7	10.7	6.4	-1.4	3.9	0.0	4.7	9.9	6.3	0.6	4.2
Global TAA	-2.6						-1.8	6.6	2.7	11.7	0.0	3.7	-3.4	5.7	0.6	10.5	4.9	3.6
Diversified Private Equity	9.9	18.9	20.0	16.3	9.4	14.8	8.1	15.9	16.3	14.8	11.2	13.2	7.8	15.4	17.6	13.1	11.2	13.0
LBO	9.9						6.1	14.7	16.4	11.7	9.3	11.6	7.6	14.4	18.4	13.8	11.6	13.1
Venture Capital	11.8	17.9	10.4	13.2	9.4	12.5	11.7	23.5	12.8	12.5	13.7	14.7	10.0	17.3	16.3	8.8	18.9	14.2
Other Private Equity	2.9	13.5	16.5	14.6	9.4	11.3	6.8	11.2	13.9	2.4	-9.3	4.7	6.5	14.3	16.7	8.2	2.5	9.5
Private Equity - Total	8.3	17.2	17.5	15.5	9.4	13.5	8.6	16.5	16.6	14.3	11.2	13.4	8.3	15.3	17.3	12.8	11.2	13.0
Total Fund Return	2.3	7.8	17.3	13.5	1.4	8.3	1.0	7.3	15.0	13.2	1.4	7.4	0.3	6.5	15.5	13.1	1.0	7.1

You were not able to provide full year returns for all of the components of returns shown in italics. The default is to set the unavailable return equal to the benchmark return.

Benchmark returns by asset class

Asset class	Your fund %						Peer average %						U.S. Public average %					
	2015	2014	2013	2012	2011	5-yr	2015	2014	2013	2012	2011	5-yr	2015	2014	2013	2012	2011	5-yr
U.S. Stock - Broad/All							0.7	12.8	33.3	16.3	1.2	12.2	0.6	12.7	33.2	16.3	1.2	12.2
U.S. Stock - Large Cap	0.5	12.6	33.6	16.4	1.5	12.3	1.0	13.2	33.0	16.3	1.5	12.4	1.2	13.1	32.9	16.2	1.6	12.4
U.S. Stock - Mid Cap							-2.3	11.5					-2.1	10.8	33.5	17.9	-1.7	10.9
U.S. Stock - Small Cap	-4.4	4.9	38.8	16.4	-4.2	9.2	-3.8	6.1	38.6	16.8	-3.7	9.7	-3.5	6.0	37.8	16.9	-3.2	9.8
Stock - EAFE	0.4	0.8	23.1	16.4	-12.0	5.0	-1.1	-3.6	22.5	17.2	-12.3	3.7	-0.7	-4.1	22.0	17.2	-12.3	3.6
Stock - Emerging	-14.9	-2.2	-2.3	18.6	-18.2	-4.6	-14.7	-1.7	-2.6	18.2	-18.8	-4.8	-14.3	-2.0	-1.7	18.2	-18.5	-4.5
Stock - ACWIxU.S.	-2.8	0.2	17.6				-4.4	-3.4	16.9	17.0	-14.0	1.7	-4.8	-3.7	16.6	17.1	-13.8	1.5
Stock - Global	-2.4	4.2	22.8	16.1			-1.7	3.8	22.1	16.1	-6.9	6.1	-1.7	3.3	22.0	15.0	-7.3	5.7
Stock - Other							-5.4	2.9	15.7	12.0	-11.3	2.3	-6.0	2.6	17.7	12.4	-8.2	3.2
Stock - Total	-1.0	6.9	26.9	16.6	-4.0	8.5	-1.6	5.0	25.6	16.6	-5.8	7.3	-1.9	5.2	25.6	16.6	-5.5	7.4
Fixed Income - U.S.	0.4	5.6	-1.3	5.5	7.8	3.5	0.4	6.7	-2.6	5.3	8.9	3.7	0.4	6.1	-2.1	4.9	8.1	3.4
Fixed Income - U.S. Gov't							0.7	0.8					0.8	0.8				
Fixed Income - U.S. Credit							0.2	5.8					-0.7	5.9				
Fixed Income - EAFE							-4.1	-5.4	-4.8	1.5	6.4	-1.4	-5.1	-3.1	-3.8	2.0	5.7	-0.9
Fixed Income - Emerging	1.3	4.8	-4.1	17.9	7.0	5.1	-1.6	1.5	-6.5	17.4	3.9	2.7	-4.7	0.0	-6.4	16.8	3.8	1.6
Fixed Income - Global							-0.8	3.2	0.0	4.8	7.4	2.9	-1.0	3.9	-1.4	4.1	6.5	2.4
Fixed Income - Long Bonds							-3.3	11.3	-0.1	6.7	14.8	5.7	-2.6	20.1	-9.1	4.6	25.4	6.9
Fixed Income - Inflation Indexed							-2.1	4.0	-5.6	7.3	12.1	3.0	-1.8	4.7	-6.4	7.2	12.7	3.1
Fixed Income - High Yield	-4.5	2.5	7.4	15.8	5.0	5.0	-3.8	2.5	7.1	14.6	5.5	5.0	-4.1	2.3	6.7	13.8	5.2	4.6
Fixed Income - Mortgages							2.0	4.9	-0.5	6.3	4.1	3.3	2.2	4.4	0.2	7.3	4.6	3.7
Fixed Income - Private Debt							0.4	4.7	6.2	10.1	0.0	4.2	0.2	4.5	7.2	6.9	3.9	4.5
Fixed Income - Other							-0.1	5.6	3.2	8.3	2.2	3.8	-0.7	5.7	5.2	9.2	3.4	4.5
Cash	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.1	0.0	0.2	0.1	0.2	0.3	0.1
Fixed Income - Total	0.4	5.3	-1.3	5.3	7.4	3.4	-0.2	5.7	-1.9	6.0	8.2	3.5	-0.2	7.4	-2.4	6.0	8.0	3.7
Commodities							-21.6	-17.4	-4.9	0.5	-9.3	-10.9	-20.8	-16.5	-5.0	0.5	-7.2	-10.1
Infrastructure	6.1	13.5	16.5	14.6			4.2	7.4	7.4	7.3	10.2	7.3	4.5	6.5	6.8	7.1	8.1	6.6
REITs	3.2	30.1	2.5	18.1	8.8	12.1	3.0	21.4	3.1	24.1	0.6	10.0	3.2	20.9	3.2	22.7	3.9	10.4
Natural Resources	6.1	13.5	16.5	14.6			1.7	9.1	9.6	8.2	-0.3	5.6	2.0	7.1	7.9	7.2	4.9	5.8
Real Estate ex-REITs	13.3	11.8	11.0	10.5	14.3	12.2	13.5	11.6	11.8	10.7	16.0	12.7	13.4	11.6	11.6	11.0	15.1	12.5
Other Real Assets							3.0	8.4	7.5	6.1	7.6	6.5	-10.2	6.7	11.2	5.5	9.2	4.2
Real Assets - Total	11.8	14.6	9.7	11.7	14.3	12.4	9.6	10.5	9.9	10.7	12.9	10.7	7.2	8.9	9.3	10.2	11.7	9.4
Hedge Funds	6.1	13.5	16.5	14.6	-5.7	8.7	1.0	4.4	9.0	7.3	-0.3	4.2	1.7	4.0	8.9	5.9	-0.2	4.0
Global TAA	6.1						1.1	4.7	9.4	10.7	1.3	5.3	1.1	5.2	9.3	9.3	2.5	5.4
Diversified Private Equity ¹	6.1	13.5	16.5	14.6	9.4	12.0	4.5	15.1	29.3	14.3	11.1	14.6	4.8	14.4	30.7	13.4	11.7	14.7
LBO ¹	6.1						2.4	13.4	32.5	15.3	9.4	14.2	4.0	12.2	31.6	14.4	9.6	14.0
Venture Capital ¹	6.1	13.5	16.5	14.6	9.4	12.0	3.3	12.5	30.2	17.0	10.1	14.3	5.1	12.1	31.1	15.3	9.3	14.3
Other Private Equity ¹	6.1	13.5	16.5	14.6	9.4	12.0	2.7	13.3	28.5	16.0	6.7	13.1	4.2	11.8	30.7	16.6	9.5	14.2
Private Equity ¹ - Total	6.1	13.5	16.5	14.6	9.4	12.0	4.5	15.1	29.3	14.3	11.1	14.6	4.7	14.3	30.7	13.3	11.7	14.7
Total Policy Return	1.7	8.3	18.1	13.9	0.8	8.4	0.6	7.0	15.5	12.6	1.6	7.3	0.1	6.5	15.1	12.5	1.5	7.0

1. To enable fairer comparisons, the policy returns of all participants except your fund were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. If CEM used this same adjustment for your fund, your 5-year policy return would be 8.6%, 0.2% higher than your actual 5-year policy return of 8.4%. Mirroring this, your 5-year total fund net value added would be 0.2% lower. Refer to the Research section pages 6-7 for details.

Net value added by asset class

Asset class	Your fund %						Peer average %						U.S. Public average %					
	2015	2014	2013	2012	2011	5-yr	2015	2014	2013	2012	2011	5-yr	2015	2014	2013	2012	2011	5-yr
U.S. Stock - Broad/All							-0.6	-2.0	0.7	0.0	-0.9	-0.7	-0.4	-1.6	0.2	-0.1	-0.5	-0.5
U.S. Stock - Large Cap	0.5	-0.2	-2.5	-0.8	0.4	-0.4	0.2	-0.3	0.0	-0.3	0.5	0.0	-0.1	-0.5	0.7	-0.1	-0.3	-0.1
U.S. Stock - Mid Cap							0.2	-2.6					-0.3	-2.7	3.7	-1.6	3.0	0.4
U.S. Stock - Small Cap	2.2	-0.6	3.4	-1.7	1.4	0.9	0.7	-0.4	1.0	-0.5	0.7	0.3	0.2	-0.8	1.1	-0.8	-0.2	-0.1
Stock - EAFE	3.2	0.3	2.2	-0.1	-0.4	1.0	0.9	0.2	1.1	0.5	0.4	0.6	1.1	0.3	1.3	0.1	0.3	0.6
Stock - Emerging	3.0	0.5	0.9	1.4	2.9	1.8	0.7	0.7	0.1	1.1	0.6	0.6	0.1	0.5	0.2	0.6	-0.9	0.0
Stock - ACWIxU.S.	1.9	0.1	0.0				2.3	0.6	1.9	0.7	0.4	1.0	2.4	0.2	2.4	0.7	1.5	1.4
Stock - Global	1.1	-0.5	1.7	-0.1			0.7	1.0	3.9	0.2	-0.2	1.0	0.0	0.5	2.3	0.1	0.1	0.5
Stock - Other							-0.2	0.5	0.0	1.1	1.7	0.6	0.6	2.6	0.4	-0.7	1.6	1.1
Stock - Total	1.4	-0.1	0.1	-0.5	0.1	0.2	0.3	0.5	0.7	0.3	0.4	0.4	0.4	-0.1	0.9	0.2	0.3	0.3
Fixed Income - U.S.	0.6	0.0	-0.2	-0.9	-0.4	-0.2	0.1	0.3	0.4	1.2	-0.2	0.3	-0.2	-0.3	0.5	2.0	0.3	0.5
Fixed Income - U.S. Gov't							-0.1	0.2					-0.1	0.2				
Fixed Income - U.S. Credit							-2.1	-1.4					-1.5	0.4				
Fixed Income - EAFE							-0.2	2.4	-0.4	-1.2	0.9	0.3	0.2	0.4	0.7	-1.1	0.7	0.2
Fixed Income - Emerging	-0.6	-3.2	-0.7	0.7	-2.1	-1.2	-0.6	-1.8	0.1	0.1	-1.7	-0.7	0.3	-0.8	-1.0	-0.2	-3.0	-0.9
Fixed Income - Global							-0.3	0.7	0.8	1.0	-2.8	-0.1	-1.0	-0.7	1.0	4.1	-1.3	0.4
Fixed Income - Long Bonds							0.0	-3.6	4.8	15.3	-0.8	3.0	-0.6	3.3	2.2	5.6	0.2	2.7
Fixed Income - Inflation Indexed							0.3	-0.4	-1.8	0.4	0.7	-0.1	0.2	-0.2	-1.0	0.5	0.5	0.1
Fixed Income - High Yield	0.0	-0.4	0.7	-0.9	1.0	0.1	0.7	0.4	0.1	0.4	-1.2	0.1	1.0	0.6	0.5	1.6	-1.6	0.5
Fixed Income - Mortgages							1.5	3.0	5.3	2.5	1.8	2.9	1.3	2.8	4.8	4.5	-1.3	2.3
Fixed Income - Private Debt							0.9	0.2	0.0	-1.6	0.0	-0.1	1.5	-2.7	-0.4	2.1	-0.4	-0.2
Fixed Income - Other							-0.7	-0.8	3.5	1.6	-0.4	0.6	-0.1	-0.3	2.2	3.2	-1.6	0.8
Cash	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.3	0.2	0.8	3.2	1.0	0.2	0.2	0.1	0.4	1.1	0.4
Fixed Income - Total	0.0	-1.1	0.4	-0.6	-2.1	-0.6	0.0	-0.4	0.8	1.3	-0.8	0.2	-0.3	-2.0	1.2	1.9	-0.9	0.0
Commodities							-2.3	1.1	-1.1	-2.2	3.3	-0.3	-1.6	1.1	-0.5	-0.3	-0.9	-0.7
Infrastructure	-0.8	4.0	-13.0	14.0			-0.2	16.2	0.3	0.4	-25.3	-2.4	0.8	6.2	3.0	-0.7	-6.3	0.6
REITs	0.0	0.3	-0.6	-0.2	0.6	0.0	0.4	-2.0	1.9	0.9	-1.2	0.0	-1.0	-1.2	1.0	-0.8	-1.8	-0.9
Natural Resources	-4.1	-5.8	-9.0	-37.7			-6.1	-0.6	-0.4	-9.7	3.8	-2.7	-4.2	3.9	-1.6	-5.4	-1.7	-1.9
Real Estate ex-REITs	-1.2	3.0	0.2	3.7	5.7	2.2	-0.2	2.5	0.9	0.2	-0.7	0.5	-0.3	0.8	0.8	-0.6	-1.6	-0.2
Other Real Assets							-9.2	-3.3	-6.3	-5.0	-1.9	-5.2	-2.9	0.1	-1.0	-1.9	-4.2	-2.0
Real Assets - Total	-1.6	1.6	0.0	3.0	3.9	1.3	0.3	2.4	0.8	0.5	-0.4	0.7	1.1	2.4	1.3	-0.2	-1.5	0.6
Hedge Funds	-8.4	-12.1	-6.6	-8.8	3.3	-6.3	-1.4	0.3	1.7	-0.9	-1.1	-0.3	-1.7	0.5	0.9	0.5	0.8	0.2
Global TAA	-8.7						-2.9	1.9	-6.7	1.0	-1.3	-1.6	-4.5	0.6	-8.7	1.2	2.4	-1.9
Diversified Private Equity ¹	3.8	5.4	3.5	1.6	0.0	2.8	3.6	0.8	-13.0	0.4	0.1	-1.4	3.0	1.0	-13.1	-0.3	-0.5	-1.7
LBO ¹	3.8						3.7	1.3	-16.2	-3.6	-0.1	-2.6	3.6	2.2	-13.3	-0.6	2.0	-0.9
Venture Capital ¹	5.7	4.4	-6.1	-1.4	0.0	0.5	8.4	10.9	-17.4	-4.5	3.5	0.5	4.9	5.2	-14.8	-6.6	9.6	-0.1
Other Private Equity ¹	-3.2	0.0	0.0	0.0	0.0	-0.7	4.1	-2.1	-14.5	-13.5	-15.9	-8.4	2.3	2.5	-14.0	-8.4	-6.6	-4.7
Private Equity ¹ - Total	2.2	3.7	1.1	0.9	0.0	1.6	4.1	1.4	-12.7	-0.1	0.1	-1.2	3.6	1.0	-13.4	-0.5	-0.5	-1.7
Total fund	0.6	-0.5	-0.8	-0.5	0.5	-0.1	0.4	0.3	-0.4	0.6	-0.2	0.1	0.2	0.0	0.4	0.6	-0.6	0.1

Total net value add is determined by both actual and policy allocation. It is the outcome of total net return (page 6) minus total benchmark return (page 7). Aggregate net returns are an asset weighted average of all categories that the fund has an actual allocation to. Aggregate benchmark returns are a policy weighted average and includes only those categories that are part of your policy fund's mix.

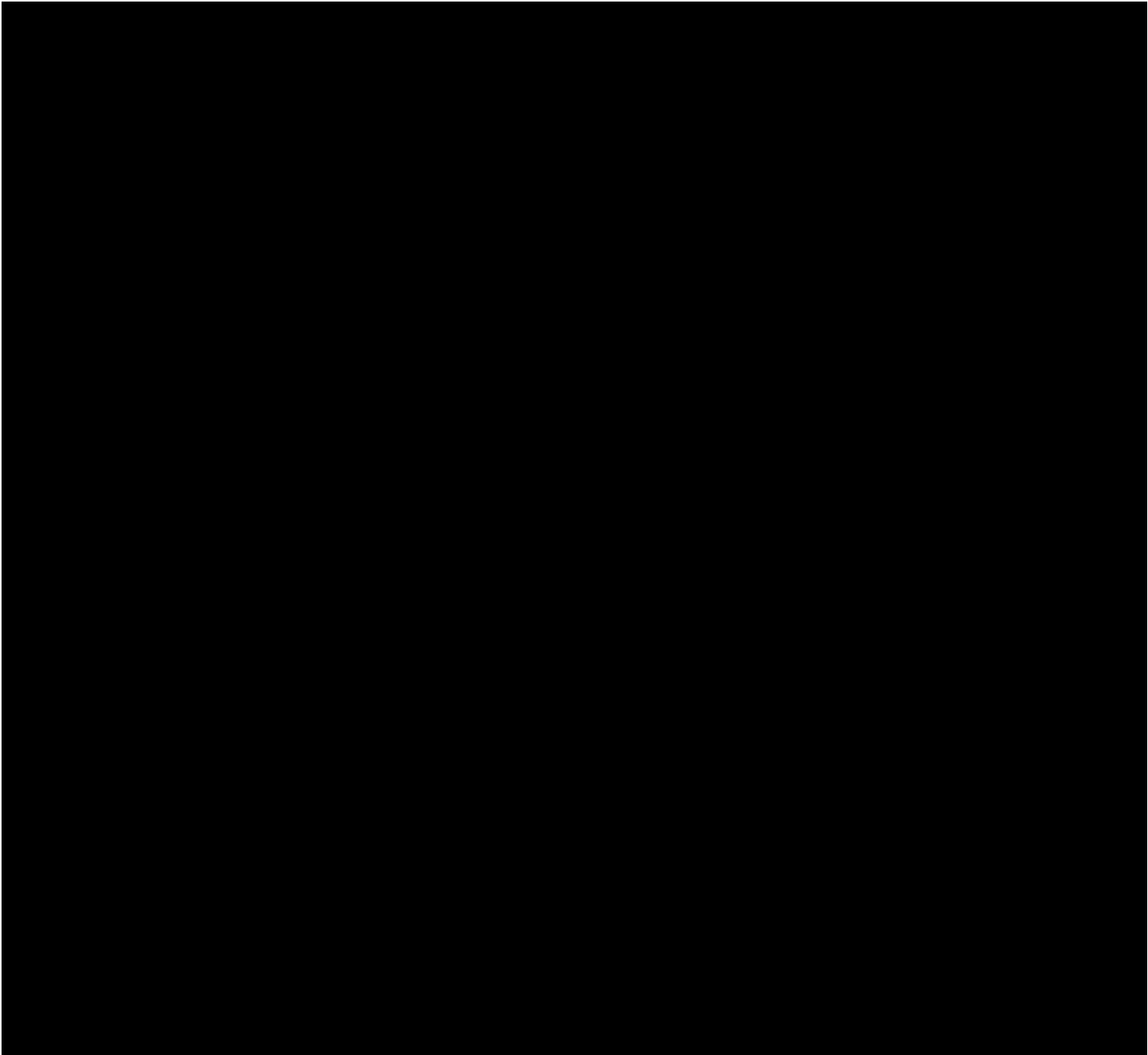
You were not able to provide full year returns for all of the components of returns of asset classes with values shown in italics. The default is to set the unavailable return equal to the benchmark return.

1. To enable fairer comparisons, the policy returns of all participants except your fund were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. If CEM used this same adjustment for your fund, your 5-year policy return would be 8.6%, 0.2% higher than your actual 5-year policy return of 8.4%. Mirroring this, your 5-year total fund net value added would be 0.2% lower. Refer to the Research section pages 6-7 for details.

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Your policy return and value added calculation - 2015

2015 Policy Return and Value Added

Asset class	Policy weight	Benchmark Description	Return	Net return	Value added
U.S. Stock - Large Cap	31.0%	Russell 1000 (Russell 3000 for total Dom Equity)	0.5%	1.0%	0.5%
U.S. Stock - Small Cap		Russell 2000	-4.4%	-2.2%	2.2%
Stock - EAFE	20.8%	MSCI World xUS 50% Hedged Net	0.4%	3.5%	3.2%
Stock - Emerging	5.2%	MSCI Emerging Market net	-14.9%	-12.0%	3.0%
Stock - ACWIxU.S.		International Blended Benchmark	-2.8%	-0.9%	1.9%
Stock - Global		MSCI ACWI net	-2.4%	-1.3%	1.1%
Fixed Income - U.S.	18.0%	Barclays Universal for total FI (Barclays Aggregate Inc	0.4%	1.0%	0.6%
Fixed Income - Emerging		Barclays Emerging Market	1.3%	0.6%	-0.6%
Fixed Income - High Yield		Barclays US Corp High Yield	-4.5%	-4.5%	0.0%
Cash	1.0%	US 90 day T bill	0.1%	0.1%	0.0%
Infrastructure		Custom (Alternative Investment Actual Return)	6.1%	5.3%	-0.8%
REITs	1.5%	Your REIT benchmark	3.2%	3.2%	0.0%
Natural Resources		Custom (Alternative Investment Actual Return)	6.1%	2.0%	-4.1%
Real Estate ex-REITs	8.5%	NCREIF NPI	13.3%	12.2%	-1.2%
Hedge Funds		Custom (Alternative Investment Actual Return)	6.1%	-2.3%	-8.4%
Global TAA		Custom (Alternative Investment Actual Return)	6.1%	-2.6%	-8.7%
Diversified Private Equity		Custom (Alternative Investment Actual Return)	6.1%	9.9%	3.8%
LBO	14.0%	Custom (Alternative Investment Actual Return)	6.1%	9.9%	3.8%
Venture Capital		Custom (Alternative Investment Actual Return)	6.1%	11.8%	5.7%
Other Private Equity		Custom (Alternative Investment Actual Return)	6.1%	2.9%	-3.2%
Total	100.0%				
Net Actual Return (reported by you)					2.3%
Calculated Policy Return = sum of (policy weights X benchmark returns)				1.6%	
Adjustment to reflect rebalancing and overlay impacts				<u>0.1%</u>	
Policy Return					<u>1.7%</u>
Net Value Added (Net Return - Policy Return)					0.6%

Your policy return and value added calculations - 2011 to 2014

2014 Policy Return and Value Added

Asset class	Policy weight	Benchmark Description	Return	Net return	Value added
U.S. Stock - Large Cap	31.0%	Russell 1000 (Rus	12.6%	12.4%	-0.2%
U.S. Stock - Small Cap		Russell 2000	4.9%	4.3%	-0.6%
Stock - EAFE	20.8%	MSCI World xUS !	0.8%	1.1%	0.3%
Stock - Emerging	5.2%	MSCI Emerging IV	-2.2%	-1.7%	0.5%
Stock - ACWIxU.S.		International Bler	0.2%	0.4%	0.1%
Stock - Global		MSCI ACWI Net	4.2%	3.7%	-0.5%
Fixed Income - U.S.	18.0%	Barclays Universa	5.6%	5.5%	0.0%
Fixed Income - Emerging		Barclays Emergin	4.8%	1.5%	-3.2%
Fixed Income - High Yield		Barclays US Corp	2.5%	2.1%	-0.4%
Cash	1.0%	US 90 day T bill	0.0%	0.1%	0.0%
Infrastructure		Custom (Alternat	13.5%	17.5%	4.0%
REITs	1.5%	Your REIT benchn	30.1%	30.5%	0.3%
Natural Resources		Custom (Alternat	13.5%	7.7%	-5.8%
Real Estate ex-REITs	8.5%	NCREIF NPI	11.8%	14.8%	3.0%
Hedge Funds		Custom (Alternat	13.5%	1.5%	-12.1%
Diversified Private Equity	14.0%	Custom (Alternat	13.5%	18.9%	5.4%
Venture Capital		Custom (Alternat	13.5%	17.9%	4.4%
Other Private Equity		Custom (Alternat	13.5%	13.5%	0.0%
Total	100.0%				
Net Return (reported by you)					7.8%
Calculated policy return (sum: Policy weights x benchmarks)				8.3%	
Adjustment to reflect rebalancing and overlay impacts				0.0%	
Policy Return					8.3%
Net Value Added (Net Return - Policy Return)					-0.5%

2012 Policy Return and Value Added

Asset class	Policy weight	Benchmark Description	Return	Net return	Value added
U.S. Stock - Large Cap	38.0%	Russell 1000 (Rus	16.4%	15.6%	-0.8%
U.S. Stock - Small Cap		Russell 2000	16.4%	14.6%	-1.7%
Stock - EAFE	18.4%	MSCI World xUS !	16.4%	16.3%	-0.1%
Stock - Emerging	4.6%	MSCI Emerging IV	18.6%	20.0%	1.4%
Stock - Global		MSCI ACWI	16.1%	16.1%	-0.1%
Fixed Income - U.S.	18.0%	Barclays Universa	5.5%	4.6%	-0.9%
Fixed Income - Emerging		Barclays Emergin	17.9%	18.6%	0.7%
Fixed Income - High Yield		Barclays US Corp	15.8%	14.9%	-0.9%
Cash	1.0%	US 90 day T bill	0.1%	0.1%	0.0%
Infrastructure		Custom (Alternat	14.6%	28.6%	14.0%
REITs	1.5%	Your REIT benchn	18.1%	17.8%	-0.2%
Natural Resources		Custom (Alternat	14.6%	-23.0%	-37.7%
Real Estate ex-REITs	8.5%	NCREIF NPI	10.5%	14.2%	3.7%
Hedge Funds		Custom (Alternat	14.6%	5.8%	-8.8%
Diversified Private Equity	10.0%	Custom (Alternat	14.6%	16.3%	1.6%
Venture Capital		Custom (Alternat	14.6%	13.2%	-1.4%
Other Private Equity		Custom (Alternat	14.6%	14.6%	0.0%
Total	100.0%				
Net Return (reported by you)					13.5%
Calculated policy return (sum: Policy weights x benchmarks)				13.7%	
Adjustment to reflect rebalancing and overlay impacts				0.2%	
Policy Return					13.9%
Net Value Added (Net Return - Policy Return)					-0.5%

2013 Policy Return and Value Added

Asset class	Policy weight	Benchmark Description	Return	Net return	Value added
U.S. Stock - Large Cap	33.0%	Russell 1000 (Rus	33.6%	31.1%	-2.5%
U.S. Stock - Small Cap		Russell 2000	38.8%	42.2%	3.4%
Stock - EAFE	20.0%	MSCI World xUS !	23.1%	25.3%	2.2%
Stock - Emerging	5.0%	MSCI Emerging IV	-2.3%	-1.3%	0.9%
Stock - ACWIxU.S.		International Bler	17.6%	17.6%	0.0%
Stock - Global		MSCI ACWI	22.8%	24.5%	1.7%
Fixed Income - U.S.	18.0%	Barclays Universa	-1.3%	-1.6%	-0.2%
Fixed Income - Emerging		Barclays Emergin	-4.1%	-4.8%	-0.7%
Fixed Income - High Yield		Barclays US Corp	7.4%	8.2%	0.7%
Cash	1.0%	US 90 day T bill	0.1%	0.1%	0.0%
Infrastructure		Custom (Alternat	16.5%	3.5%	-13.0%
REITs	1.5%	Your REIT benchn	2.5%	1.8%	-0.6%
Natural Resources		Custom (Alternat	16.5%	7.5%	-9.0%
Real Estate ex-REITs	8.5%	NCREIF NPI	11.0%	11.2%	0.2%
Hedge Funds		Custom (Alternat	16.5%	9.8%	-6.6%
Diversified Private Equity	13.0%	Custom (Alternat	16.5%	20.0%	3.5%
Venture Capital		Custom (Alternat	16.5%	10.4%	-6.1%
Other Private Equity		Custom (Alternat	16.5%	16.5%	0.0%
Total	100.0%				
Net Return (reported by you)					17.3%
Calculated policy return (sum: Policy weights x benchmarks)				18.5%	
Adjustment to reflect rebalancing and overlay impacts				-0.4%	
Policy Return					18.1%
Net Value Added (Net Return - Policy Return)					-0.8%

2011 Policy Return and Value Added

Asset class	Policy weight	Benchmark Description	Return	Net return	Value added
U.S. Stock - Large Cap	39.0%	Russell 1000	1.5%	1.9%	0.4%
U.S. Stock - Small Cap		Russell 2000	-4.2%	-2.8%	1.4%
Stock - EAFE	18.4%	MSCI World xUS !	-12.0%	-12.4%	-0.4%
Stock - Emerging	4.6%	MSCI Emerging IV	-18.2%	-15.3%	2.9%
Stock - Global					
Fixed Income - U.S.	18.0%	Barclays US Aggre	7.8%	7.4%	-0.4%
Fixed Income - Emerging		Barclays Emergin	7.0%	4.9%	-2.1%
Fixed Income - High Yield		Barclays US Corp	5.0%	6.0%	1.0%
Cash	1.0%	US 90 day T bill	0.1%	0.2%	0.1%
Infrastructure					
REITs		Wilshire REIT	8.8%	9.3%	0.6%
Natural Resources					
Real Estate ex-REITs	10.0%	NCREIF NPI	14.3%	20.0%	5.7%
Hedge Funds		HFRI Fund of Fun	-5.7%	-2.4%	3.3%
Diversified Private Equity	9.0%	Custom (Alternat	9.4%	9.4%	0.0%
Venture Capital		Custom (Alternat	9.4%	9.4%	0.0%
Other Private Equity		Custom (Alternat	9.4%	9.4%	0.0%
Total	100.0%				
Net Return (reported by you)					1.4%
Calculated policy return (sum: Policy weights x benchmarks)				1.2%	
Adjustment to reflect rebalancing and overlay impacts				-0.4%	
Policy Return					0.8%
Net Value Added (Net Return - Policy Return)					0.5%

Profit/Loss on overlay programs

Overlay type	Your fund		Peer median				U.S. Public median			
	2015	2014	2015		2014		2015		2014	
	bps	bps	bps	#	bps	#	bps	#	bps	#
Int. Discretionary Currency			3	2	3	2	3	2	3	2
Ext. Discretionary Currency			3	2	2	2	3	2	2	2
Internal Global TAA									0	1
External Global TAA										
Internal PolicyTilt TAA										
External PolicyTilt TAA										
Internal Commodities										
External Commodities					0	1	-455	1	0	2
Internal Long/Short										
External Long/Short										
Internal Other			1	2	0	1	1	2	0	1
External Other			1	1	10	1	0	3	5	2
Total Profit/Loss			1	5	5	4	0	8	1	7

Profit/loss in basis points was calculated using total fund average holdings. This was done to measure the impact of the program at the total fund level.

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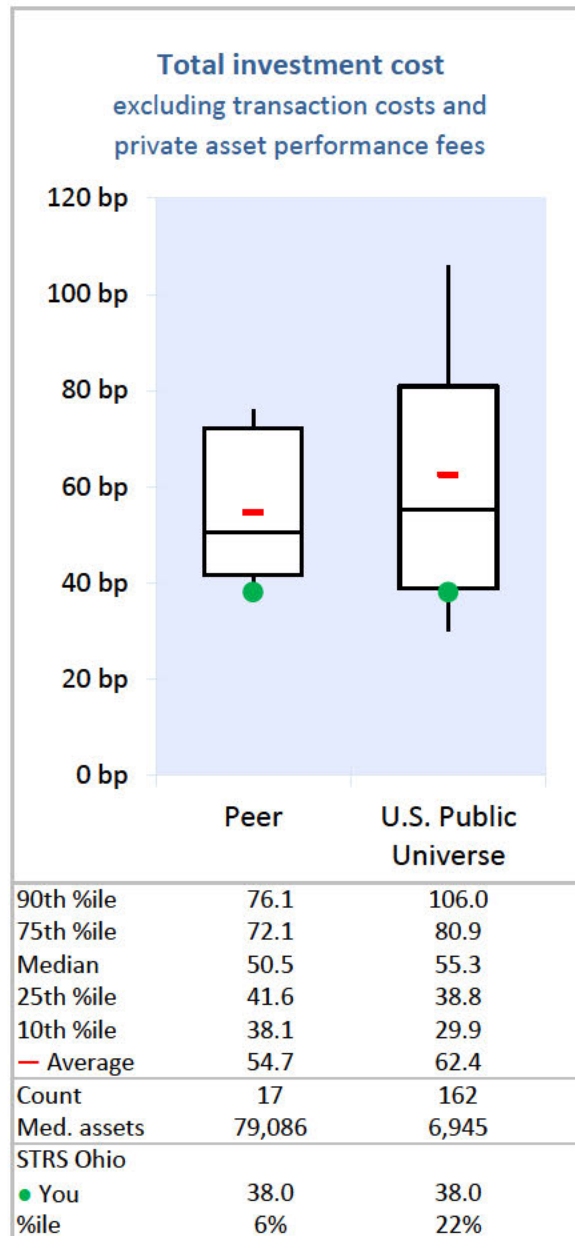
Total cost and benchmark cost

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Comparisons of total investment cost

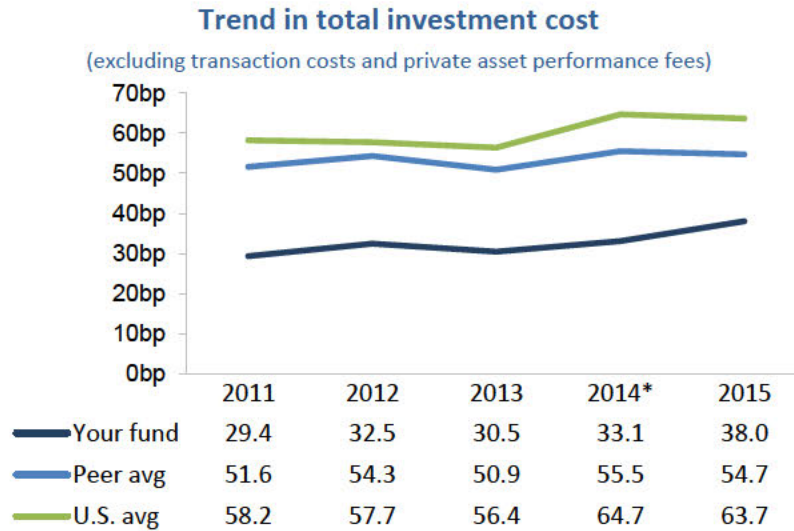
Your total investment cost, excluding transaction costs and private asset performance fees, of 38.0 bps was below the peer median of 50.5 bps.

Differences in total investment cost are often caused by two factors that are usually outside of management's control: asset mix and fund size. Therefore, to assess whether your fund's total investment cost is high or low given your unique asset mix and size, CEM calculates a benchmark cost for your fund. Benchmark cost analysis begins on page 7 of this section.



Trend in total investment cost

Your total investment cost, excluding transaction costs and private asset performance fees, increased from 29.4 bps in 2011 to 38.0 bps in 2015.



Trend analysis is based on the 127 U.S. funds and the 17 peer funds with 5 or more consecutive years of data.

* Starting in 2014 hedge fund performance fees are being included for all participants. This is one reason for the uptick in costs relative to 2013.

Types of costs included in your total investment cost

The table below outlines the types of costs included in your total investment cost.

Asset class	<u>Internal</u>		<u>External</u>			
	In-house total cost	Transaction costs	Manager base fees	Monitoring & other costs	Perform. fees (active only)	Transaction costs
<u>Public</u>						
(Stock, Fixed income, commodities, REITs)	✓	✗	✓	✓	✓	✗
Derivatives/Overlays	✓	✗	✓	✓	✓	✗
<u>Hedge funds & Global TAA</u>						
Hedge Funds	n/a	n/a	✓	✓	✓	✗
Global TAA	✓	✗	✓	✓	✓	✗
<u>Private equity</u>						
(Diversified private equity, venture capital, LBO, other private equity)	✓	✗	✓*	✓	✗	✗
<u>Private real assets</u>						
(Infrastructure, natural resources, real estate ex-REITs, other real assets)	✓	✗	✓*	✓	✗	✗

*For limited partnerships, external manager base fees represent gross contractual management fees.

- ✓ indicates cost is included.
- ✗ indicates cost is excluded.
- Green shading indicates that the cost type has been newly added for the 2014 data year.
- CEM currently excludes external private asset performance fees and all transaction costs from your total cost because only a limited number of participants are currently able to provide complete data.

Detailed breakdown of your total investment cost

Your 2015 total investment cost, excluding transaction costs and private asset performance fees, was 38.0 bp or \$274.6 million.

Your investment costs

	Internal		External Passive		External Active			Total		
	Passive	Active	Fees	Monitoring & Other	Base Fees	Perform. Fees ¹	Monitoring & Other	\$000s	bps	% of Total
Asset management										
U.S. Stock - Large Cap	41	11,893			2,168		143	14,245		5%
U.S. Stock - Small Cap		293			8,895		141	9,330		3%
Stock - EAFE		2,834			19,935		254	23,022		8%
Stock - Emerging		2,595			5,318		264	8,177		3%
Stock - ACWIxU.S.		433			5,022		24	5,480		2%
Stock - Global		457						457		0%
Fixed Income - U.S.		2,413						2,413		1%
Fixed Income - Emerging					3,587		170	3,757		1%
Fixed Income - High Yield					4,428		277	4,705		2%
Cash		269						269		0%
REITs										
Real Estate ex-REITs		16,561						16,561		6%
Real Estate ex-REITs - LPs					17,938		444	18,382		7%
Infrastructure - Fund of Funds					501		40	541		0%
Underlying Fund of Fund Fees					1,946			1,946		1%
Natural Resources		110						110		0%
Natural Resources - LPs					7,660		102	7,761		3%
Hedge Funds					35,310	9,973	300	45,583		17%
Global TAA					678	0	28	706		0%
Diversified Private Equity					1,430		11	1,441		1%
Diversified Private Equity - Fund of Funds										
Underlying Fund of Fund Fees										
LBO					42,752		330	43,082		16%
LBO - Fund of Funds					5,966		218	6,184		2%
Underlying Fund of Fund Fees					11,206			11,206		4%
Venture Capital					15,585		354	15,939		6%
Venture Capital - Fund of Funds					1,562		19	1,581		1%
Underlying Fund of Fund Fees					3,665			3,665		1%
Other Private Equity		118			19,371		867	20,356		7%
Other Private Equity - Co-investments					0		0	0		0%
Overlay Programs		112			0	0	346	457		0%
Total asset management costs excluding private asset performance fees								267,355	37.0bp	97%
Oversight, custodial & other asset related costs										
Oversight of the Fund								4,539		2%
Trustee & Custodial								2,150		1%
Audit								158		0%
Other								375		0%
Total oversight, custodial & other costs								7,222	1.0bp	3%
Total investment costs excluding transaction costs and private asset performance fees								274,578	38.0bp	100%

¹ Starting in 2014, CEM changed its methodology to include performance fees on hedge funds in total cost used for comparison and benchmarking. Performance fees for real estate, infrastructure, natural resources and private equity are excluded.

Changes in your investment costs

The table below shows how your investment costs have changed from year to year by asset class.

Change in your investment costs (2015 - 2011)

	Investment costs (\$000s)					Change (\$000s)				Change (%)			
	2015	2014	2013	2012	2011	2015	2014	2013	2012	2015	2014	2013	2012
Asset management													
U.S. Stock - Large Cap	14,245	12,970	12,939	12,630	10,884	1,275	31	309	1,746	10%	0%	2%	16%
U.S. Stock - Small Cap	9,330	9,658	9,827	11,039	10,382	-328	-169	-1,212	657	-3%	-2%	-11%	6%
Stock - EAFE	23,022	22,371	20,301	18,334	19,733	651	2,070	1,967	-1,400	3%	10%	11%	-7%
Stock - Emerging	8,177	8,780	9,689	9,120	8,813	-604	-908	569	307	-7%	-9%	6%	3%
Stock - ACWIxU.S.	5,480	2,416	409	0	0	3,064	2,007	409		127%	491%		
Stock - Global	457	423	409	211	0	34	14	198	211	8%	3%	94%	
Fixed Income - U.S.	2,413	2,650	2,702	3,000	2,269	-236	-53	-298	731	-9%	-2%	-10%	32%
Fixed Income - Emerging	3,757	3,793	2,915	2,562	2,220	-36	878	353	342	-1%	30%	14%	15%
Fixed Income - High Yield	4,705	4,288	3,405	3,399	3,055	417	882	6	345	10%	26%	0%	11%
Cash	269	266	256	255		3	9	1	255	1%	4%	0%	
REITs	0	16	328	344	308	-16	-312	-16	36	-100%	-95%	-5%	12%
Real Estate ex-REITs	16,561	14,192	12,476	12,720	11,097	2,370	1,715	-244	1,623	17%	14%	-2%	15%
Real Estate ex-REITs - LPs	18,382	18,281	21,220	24,491	19,253	101	-2,940	-3,271	5,238	1%	-14%	-13%	27%
Infrastructure - Fund of Funds	541	557	602	590	0	-15	-45	11	590	-3%	-7%	2%	
Underlying Fund of Fund Fees	1,946	1,249	1,069	1,468	0	697	180	-399	1,468	56%	17%	-27%	
Natural Resources	110	0	0	0	0	110							
Natural Resources - LPs	7,761	5,101	4,774	3,852	0	2,660	327	922	3,852	52%	7%	24%	
Hedge Funds	45,583	55,340	23,345	20,784	9,315	-9,757	31,995	2,562	11,469	-18%	137%	12%	123%
Global TAA	706	0	0	0	0	706							
Diversified Private Equity	1,441	30,699	34,338	32,407	40,621	-29,258	-3,639	1,931	-8,214	-95%	-11%	6%	-20%
Diversified Private Equity - Fund of Funds	0	5,385	5,216	6,435	5,147	-5,385	169	-1,220	1,289	-100%	3%	-19%	25%
Underlying Fund of Fund Fees	0	7,965	7,841	8,482	8,149	-7,965	124	-641	333	-100%	2%	-8%	4%
LBO	43,082	0	0	0	0	43,082							
LBO - Fund of Funds	6,184	0	0	0	0	6,184							
Underlying Fund of Fund Fees	11,206	0	0	0	0	11,206							
Venture Capital	15,939	13,996	16,969	18,334	18,212	1,942	-2,973	-1,365	123	14%	-18%	-7%	1%
Venture Capital - Fund of Funds	1,581	1,130	1,112	0	0	451	18	1,112		40%	2%		
Underlying Fund of Fund Fees	3,665	2,824	2,372	0	0	841	452	2,372		30%	19%		
Other Private Equity	20,356	11,111	9,762	10,423	59	9,245	1,349	-661	10,364	83%	14%	-6%	17566%
Other Private Equity - Co-investments	0	0	0	0	0	0							
Overlay Programs	457	175	100	29	0	282	75	71	29	161%	75%	243%	
Total excl. private asset perf. fees	267,355	235,635	204,377	200,910	169,676	31,721	31,258	3,466	31,234	13%	15%	2%	18%
Oversight, custodial & other asset related costs													
Oversight of the Fund	4,539	3,804	4,073	4,236	8,713	735	-269	-163	-4,477	19%	-7%	-4%	-51%
Trustee & Custodial	2,150	1,673	1,438	1,438	1,849	477	235		-411	29%	16%	0%	-22%
Audit	158	136	119	173	102	22	17	-54	71	16%	14%	-31%	70%
Other	375	339	327	173	513	36	12	154	-340	11%	4%	89%	-66%
Total oversight, custodial & other	7,222	5,953	5,957	6,021	15,123	1,269	-5	-63	-9,103	21%	0%	-1%	-60%
Total investment costs ¹	274,578	241,620	210,364	206,962	184,827	32,958	31,256	3,401	22,136	14%	15%	2%	12%
Total in basis points	38.0bp	33.1bp	30.5bp	32.5bp	29.4bp								

¹ Starting in 2014, CEM changed its methodology to include performance fees on hedge funds in total cost used for comparison and benchmarking. Performance fees for real estate, infrastructure, natural resources and private equity are excluded.

Total cost versus benchmark cost

Your fund's total investment cost, excluding transaction costs and private asset performance fees, was 6.8 bps below your benchmark cost of 44.9 bps. This implies that your fund was low cost by 6.8 bps compared to the peer median, after adjusting for your fund's asset mix.

Your cost versus benchmark

	\$000s	bps
Your fund's total investment cost excluding transaction costs and illiquid asset performance fees	274,578	38.0 bp
- Your fund's benchmark	324,019	44.9 bp
= Your fund's cost savings	-49,441	-6.8 bp

Your benchmark cost is an estimate of your total costs assuming that you paid the peer median cost for each of your investment mandates and fund oversight. The calculation of your benchmark cost is shown on the following page.

The reasons why your fund's total cost was below your benchmark are summarized in the table below. Details of each of the impacts below are provided on pages 9 to 12.

Reasons why your fund was low cost

	Cost/-Savings impact	
	\$000s	bps
<u>Differences in implementation style:</u>		
External active vs. low cost styles	-48,699	-6.7 bp
Fund of funds vs. external direct	4,027	0.6 bp
Mix of internal and passive styles	3,961	0.5 bp
Style impact of overlays	332	0.0 bp
Total style impact	-40,379	-5.6 bp
<u>Paying more/-less for similar services:</u>		
External investment management	-15,724	-2.2 bp
Private asset performance fees	0	0.0 bp
Internal investment management	7,161	1.0 bp
Oversight, custodial and other	-500	-0.1 bp
Total impact of paying more /-less	-9,063	-1.3 bp
Total savings	-49,441	-6.8 bp

Benchmark cost calculation

Your 2015 benchmark cost was 44.9 basis points or \$324.0 million. It equals your holdings for each asset class multiplied by the peer median cost for the asset class. The peer median cost is the style weighted average for all implementation styles (i.e., internal passive, internal active, external passive, external active).

Calculation of your 2015 benchmark cost

Asset class	Your average assets	Weighted peer median cost ¹	Benchmark \$000s
	(A)	(B)	(A X B)
Asset management costs			
U.S. Stock - Large Cap	20,543	5.5 bp	11,294
U.S. Stock - Small Cap	1,932	38.5 bp	7,443
Stock - EAFE	11,291	18.5 bp	20,930
Stock - Emerging	2,830	40.1 bp	11,350
Stock - ACWIxU.S.	3,851	28.6 bp	11,005
Stock - Global	783	30.7 bp	2,405
Fixed Income - U.S.	10,404	5.9 bp	6,108
Fixed Income - Emerging	798	41.8 bp	3,337
Fixed Income - High Yield	1,091	38.9 bp	4,251
Cash	1,877	1.4 bp	269
Infrastructure	92	146.0 bp	1,340
REITs	1,132	31.6 bp	3,575
Real Estate ex-REITs	6,866	74.1 bp	50,883
Natural Resources	957	103.8 bp	9,932
Hedge Funds (External)	2,045	233.6 bp	47,759
Global TAA	192	65.3 bp	1,254
Diversified Private Equity	75	169.3 bp	1,275
LBO	4,303	162.7 bp	70,017
Venture Capital	1,703	178.2 bp	30,351
Other Private Equity	2,622	77.6 bp	20,356
Overlay Programs ²	72,206	0.2 bp	1,165
Benchmark for asset management	72,206	43.8 bp	316,297
Oversight, custody and other costs			
Oversight of the Fund	72,206	0.5 bp	3,362
Trustee & Custodial	72,206	0.2 bp	1,764
Consulting	72,206	0.2 bp	1,564
Audit	72,206	0.0 bp	149
Other	72,206	0.1 bp	885
Benchmark for oversight, custody & other		1.1 bp	7,722
Total benchmark cost		44.9 bp	324,019

1. The weighted peer median cost for asset management is the style-weighted average of the peer median costs for all implementation styles (i.e., internal passive, internal active, external passive, external active, fund of fund). It excludes performance fees on private assets. The style weights by asset class for your fund and the peers are shown on page 17 of this section.

2. Total fund average holdings is used as the base when calculating the relative cost impact of the overlay programs.

[illegible][illegible]

Cost impact of overlays

As summarized on the previous page, the style impact of overlays cost you 0.0 bps. If you use more overlays than your peers, or more expensive types of overlays, then it increases your relative cost.

Calculation of the cost impact of differences in the use of portfolio level overlays

[illegible]

1 [REDACTED]
[REDACTED]

Cost impact of lower cost styles

[illegible]

1. Cost/-savings for each asset class equals non-external active holdings within each asset class X cumulative impact from the three lower cost styles. By formula: [(peer median cost for the style - peer weighted average cost of lower cost styles) X (your weight for the style - peer weight for the style)]. Peer median costs for each style are shown on page 18.

Cost impact of paying more/-less for similar services

Differences in what you paid relative to your peers for similar asset management and related oversight and support services saved you 1.3 bps.

Calculation of the cost impact of paying more/-less

[illegible]

*Universe median used as peer data was insufficient.

Summary of why you are high or low cost by asset class

The table below summarizes where you are high and low cost by asset class. It also quantifies how much is due to differences in implementation style (i.e., differences in the mix of external active, external passive, internal active, internal passive and fund of fund usage) and how much is due to paying more or less for similar services (i.e., same asset class and style).

Summary of why you are high or low cost by asset class

	Your cost ¹	Benchmark = peer weighted median cost ¹	More/-less	Your average assets	More/-less (\$000s)	Due to Impl. style (\$000s)	Due to paying more/less (\$000s)
	(A)	(B)	(C = A - B)	(D)	(C X D)		
Asset management costs							
U.S. Stock - Large Cap	6.9 bp	5.5 bp	1.4 bp	20,543	2,951	-3,437	6,388
U.S. Stock - Small Cap	48.3 bp	38.5 bp	9.8 bp	1,932	1,888	30	1,857
Stock - EAFE	20.4 bp	18.5 bp	1.9 bp	11,291	2,092	2,092	0
Stock - Emerging	28.9 bp	40.1 bp	-11.2 bp	2,830	-3,173	-3,978	805
Stock - ACWIxU.S.	14.2 bp	28.6 bp	-14.3 bp	3,851	-5,526	-5,827	301
Stock - Global	5.8 bp	30.7 bp	-24.9 bp	783	-1,948	-1,948	0
Fixed Income - U.S.	2.3 bp	5.9 bp	-3.6 bp	10,404	-3,694	-3,694	0
Fixed Income - Emerging	47.1 bp	41.8 bp	5.3 bp	798	420	0	420
Fixed Income - High Yield	43.1 bp	38.9 bp	4.2 bp	1,091	454	96	358
Cash	1.4 bp	1.4 bp	0.0 bp	1,877	0	0	0
Infrastructure	271.0 bp	146.0 bp	124.9 bp	92	1,147	1,028	119
REITs	0.0 bp	31.6 bp	-31.6 bp	1,132	-3,575	-3,575	0
Real Estate ex-REITs	50.9 bp	74.1 bp	-23.2 bp	6,866	-15,940	-20,586	4,647
Natural Resources	82.2 bp	103.8 bp	-21.5 bp	957	-2,061	-3,911	1,850
Hedge Funds (External)	223.0 bp	233.6 bp	-10.6 bp	2,045	-2,176	-2,176	0
Global TAA	36.8 bp	65.3 bp	-28.6 bp	192	-548	0	-548
Diversified Private Equity	191.3 bp	169.3 bp	22.1 bp	75	166	-32	198
LBO	140.5 bp	162.7 bp	-22.2 bp	4,303	-9,545	4,492	-14,037
Venture Capital	124.4 bp	178.2 bp	-53.8 bp	1,703	-9,167	715	-9,882
Other Private Equity	77.6 bp	77.6 bp	0.0 bp	2,622	0	0	0
Overlay Programs ²	0.1 bp	0.2 bp	-0.1 bp	72,206	-707	332	-1,039
Total asset management	37.0 bp	43.8 bp	-6.8 bp	72,206	-48,941	-40,379	-8,563
Oversight, custody and other costs							
Oversight of the Fund			0.2 bp	72,206	1,178	n/a	1,178
Trustee & Custodial			0.1 bp	72,206	386	n/a	386
Consulting			-0.2 bp	72,206	-1,564	n/a	-1,564
Audit			0.0 bp	72,206	10	n/a	10
Other			-0.1 bp	72,206	-510	n/a	-510
Total oversight, custody & other	1.0 bp	1.1 bp	-0.1 bp	72,206	-500	n/a	-500
Total	38.0 bp	44.9 bp	-6.8 bp	72,206	-49,441	-40,379	-9,063

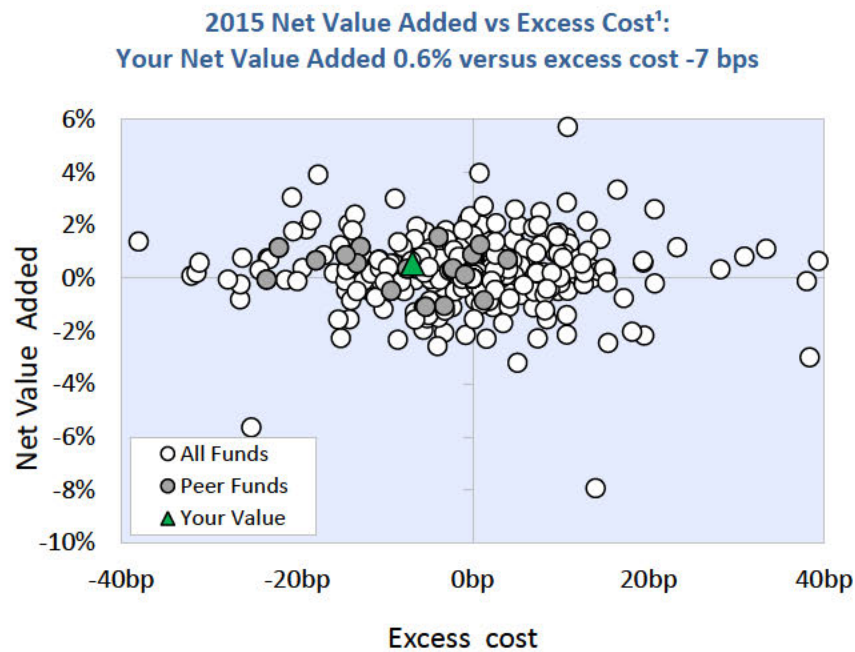
1. The weighted peer median cost for asset management is the style-weighted average of the peer median costs for all implementation styles (i.e., internal passive, internal active, external passive, external active, fund of fund). It excludes performance fees on private assets. The style weights by asset class for your fund and the peers are shown on page 17 of this section.

2. Total fund average holdings is used as the base when calculating the relative cost impact of the overlay programs.

Your cost effectiveness ranking

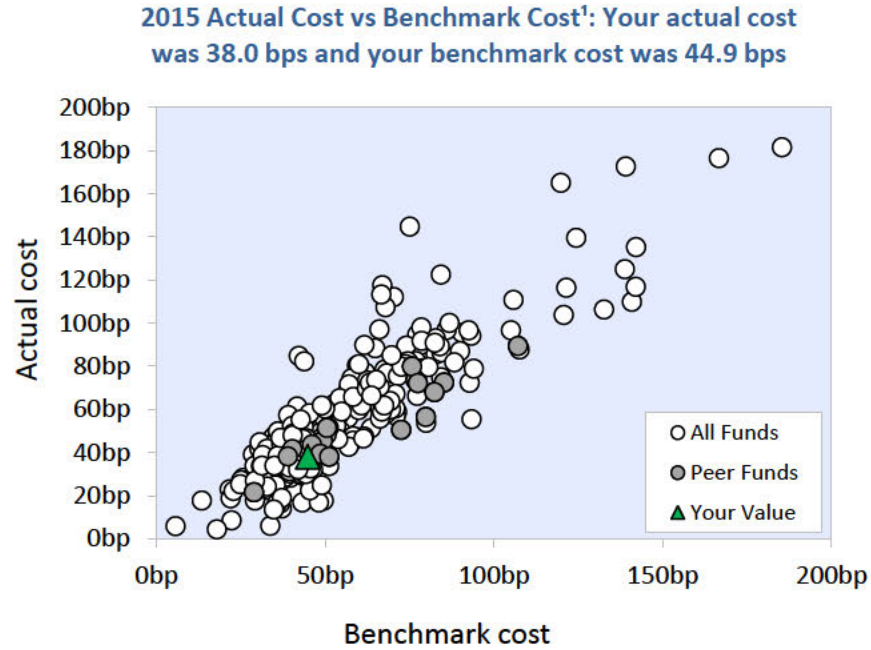
Being high or low cost is neither good nor bad. The more important question is, are you receiving sufficient value for your excess cost? At the total fund level, we provide insight into this question by combining your value added and your excess cost to create a snapshot your cost effectiveness performance relative to that of the survey universe.

For the 2015 year, your fund ranked in the positive value added, low cost quadrant.



¹ Benchmark cost and excess cost calculations are based on regression analysis (see Appendix B in this section) for all funds except your fund. Your fund's benchmark cost is based on peer-median costs (per page 7 of this section).

Actual cost versus benchmark cost



¹ Benchmark cost calculations are based on regression analysis (see Appendix B in this section) for all funds except your fund. Your fund's benchmark cost is based on peer-median costs (per page 7 of this section).

Appendix A: Benchmarking methodology formulas and data

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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Appendix A: Benchmarking methodology formulas and data (page 2 of 2)

c) 2015 cost data used to calculate weighted peer median costs and impact of mix differences.

[illegible]¹Universe median used as peer data was insufficient.

d) 2015 Style weights used to calculate the weighted peer median costs and impact of mix differences.

Style Weights	You (%)						Peer average (%)					
	Internal Passive	Internal Active	External Passive	External Active	Limited Partner.	Fund of Funds	Internal Passive	Internal Active	External Passive	External Active	Limited Partner.	Fund of Funds
U.S. Stock - Large Cap	42.4%	52.7%	0.0%	4.8%			38.3%	20.8%	24.5%	16.4%		
U.S. Stock - Small Cap	0.0%	42.0%	0.0%	58.0%			10.0%	15.3%	15.1%	59.5%		
Stock - EAFE	0.0%	49.8%	0.0%	50.2%			18.2%	9.4%	24.0%	48.3%		
Stock - Emerging	0.0%	64.8%	0.0%	35.2%			10.0%	7.1%	14.1%	68.7%		
Stock - ACWIxU.S.	0.0%	71.5%	0.0%	28.5%			0.0%	5.3%	30.9%	63.7%		
Stock - Global	0.0%	100.0%	0.0%	0.0%			1.5%	19.9%	3.5%	75.2%		
Fixed Income - U.S.	0.0%	100.0%	0.0%	0.0%			11.3%	55.7%	4.2%	28.8%		
Fixed Income - Emerging	0.0%	0.0%	0.0%	100.0%			0.0%	0.0%	0.0%	100.0%		
Fixed Income - High Yield	0.0%	0.0%	0.0%	100.0%			0.0%	3.0%	0.0%	97.0%		
Cash		100.0%		0.0%			Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
Infrastructure		0.0%		0.0%	0.0%	100.0%		4.7%		19.4%	70.1%	5.8%
REITs	100.0%	0.0%	0.0%	0.0%			21.3%	6.0%	0.0%	72.6%		
Real Estate ex-REITs		78.2%		0.0%	21.8%	0.0%		7.9%		42.8%	49.1%	0.1%
Natural Resources		45.9%		0.0%	54.1%	0.0%		4.8%		30.1%	65.1%	0.0%
Hedge Funds				100.0%		0.0%				83.9%		16.1%
Global TAA		0.0%		100.0%				8.2%		91.8%		
Diversified Private Equity		0.0%		100.0%		0.0%		0.3%		93.2%		6.5%
LBO		0.0%		77.6%		22.4%		0.0%		93.5%		6.5%
Venture Capital		0.0%		87.1%		12.9%		0.0%		93.5%		6.5%
Other Private Equity		5.6%		94.4%			Excluded	Excluded	Excluded	Excluded	Excluded	Excluded

The above data was adjusted as noted when there were insufficient peers, or for other reasons where direct comparisons were inappropriate.

Appendix B: Regression based benchmarks

[illegible]

is required.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Age Group	Percentage Vaccinated
18-24	15%
25-34	25%
35-44	35%
45-54	45%
55-64	65%
65-74	80%
75-84	90%
85+	95%

Response	Percentage
Yes, the U.S. should take action to address climate change	95%
No, the U.S. should not take action to address climate change	5%

6

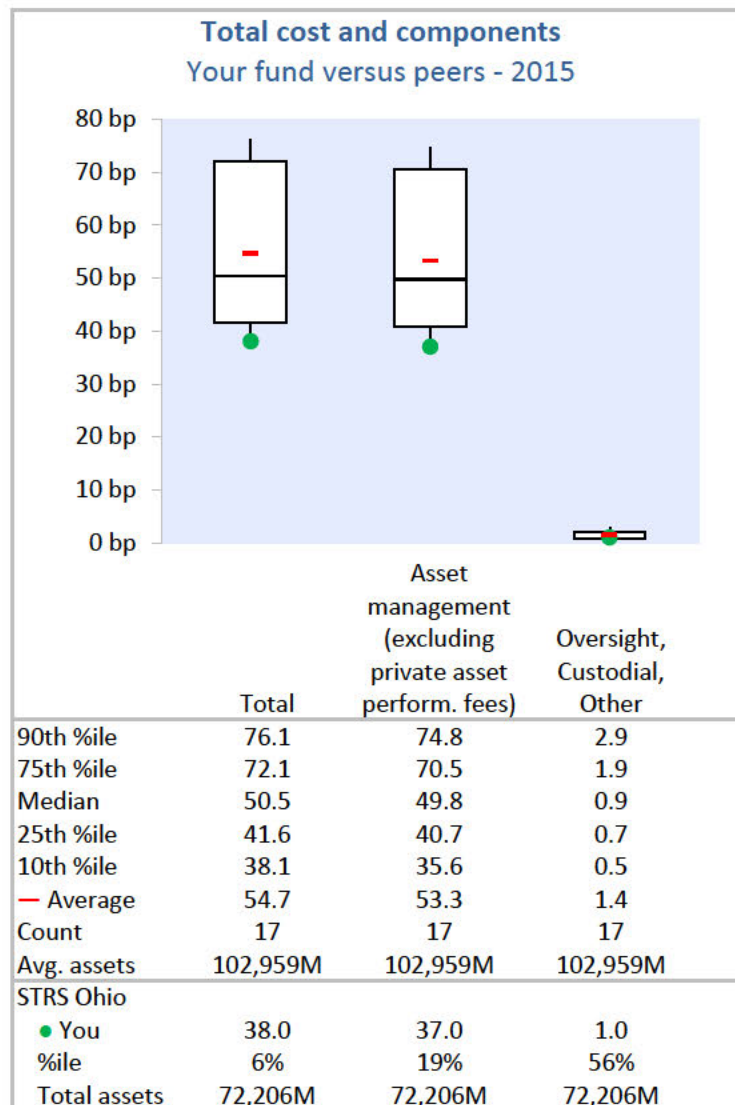
Cost comparisons

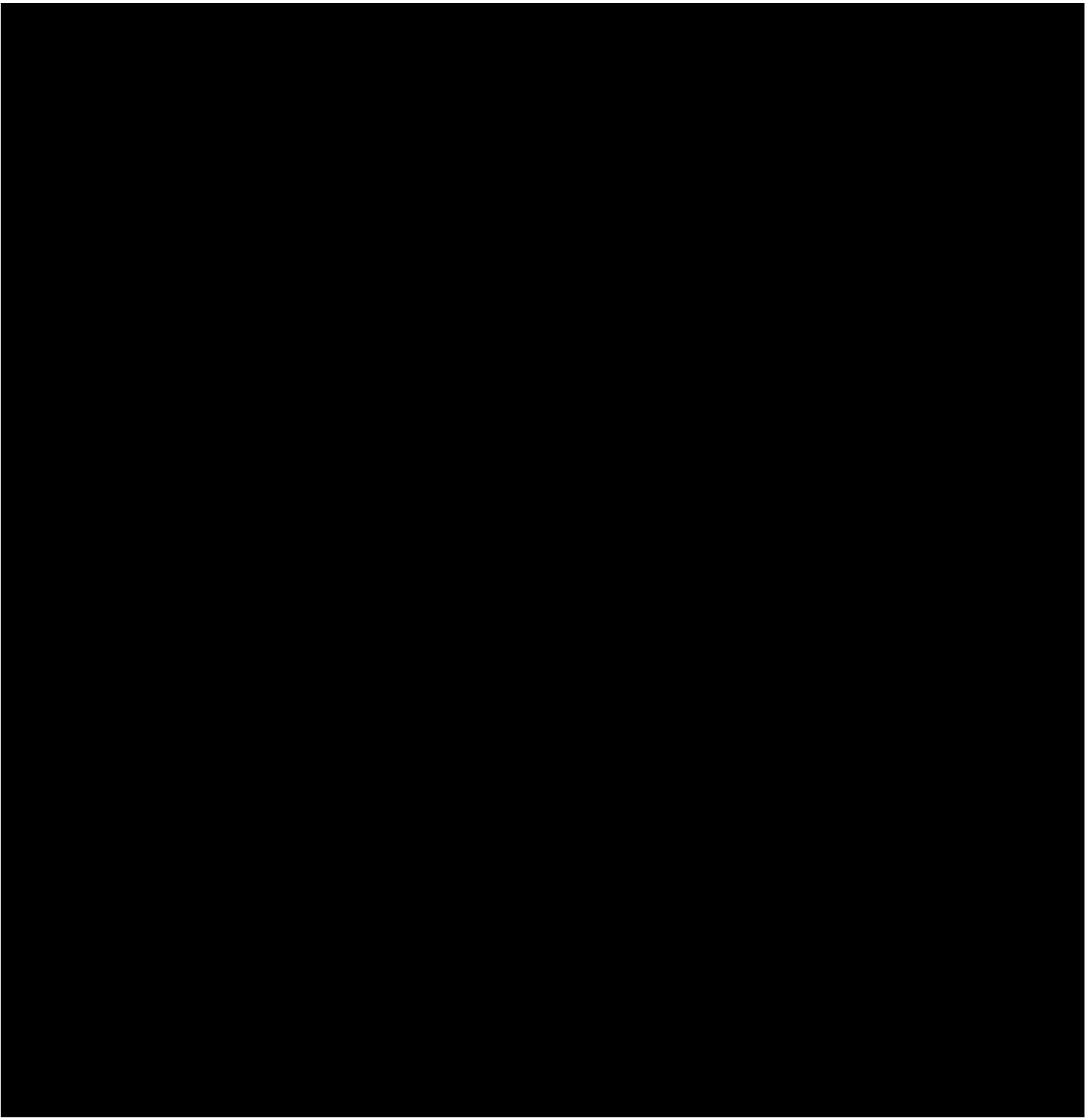
Total fund cost	2
Governance, operations & support	3
Public asset classes	
- Stock	4
- Fixed Income	13
- Commodities	25
- REITs	26
Real asset classes	
- Real estate ex-REITs	27
- Infrastructure	28
- Natural resources	29
- Other real assets	30
Private equity	
- Diversified private equity	31
- LBO	32
- Venture capital	33
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Global TAA	35
Hedge Funds	36
Overlays	37

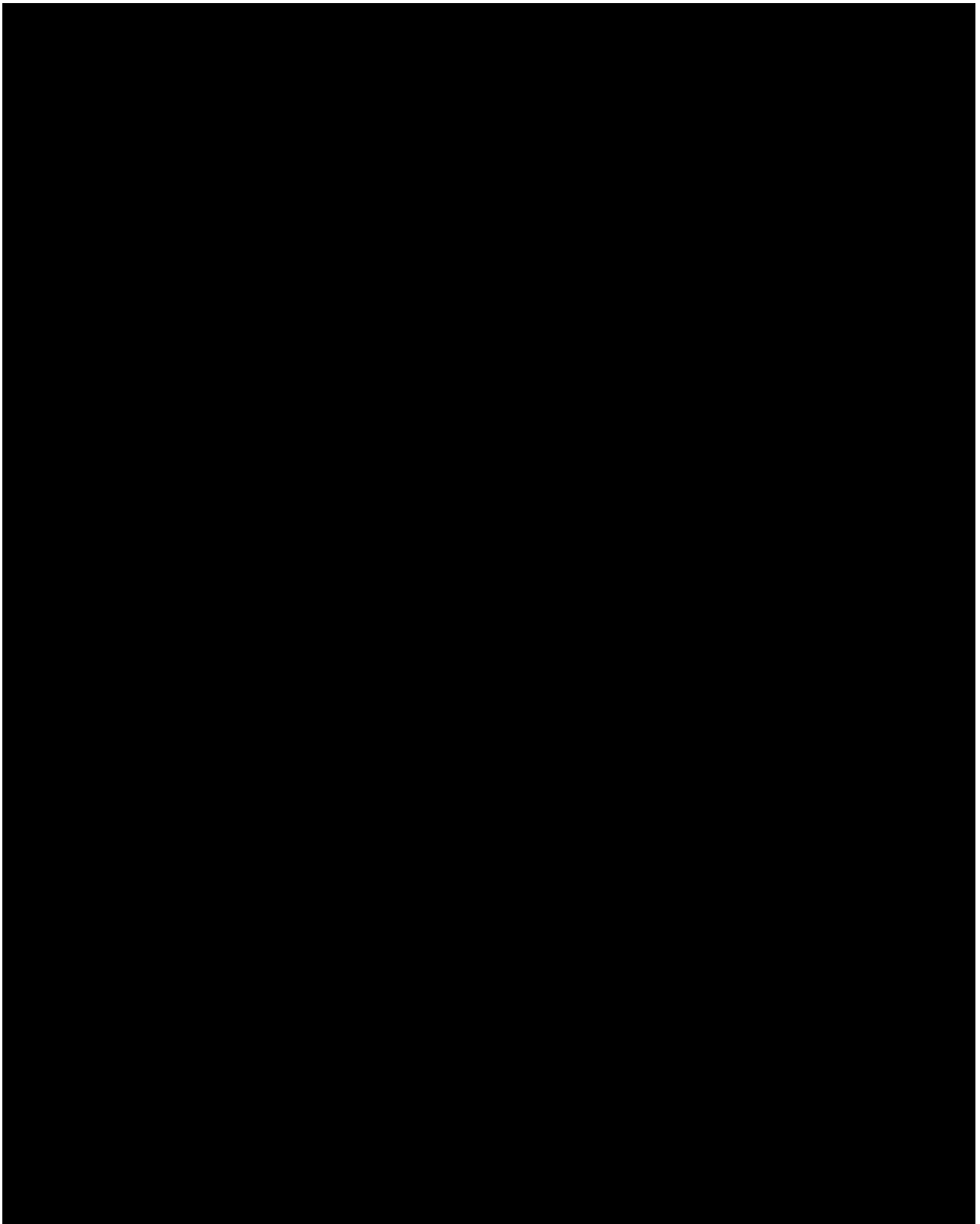
Total fund cost

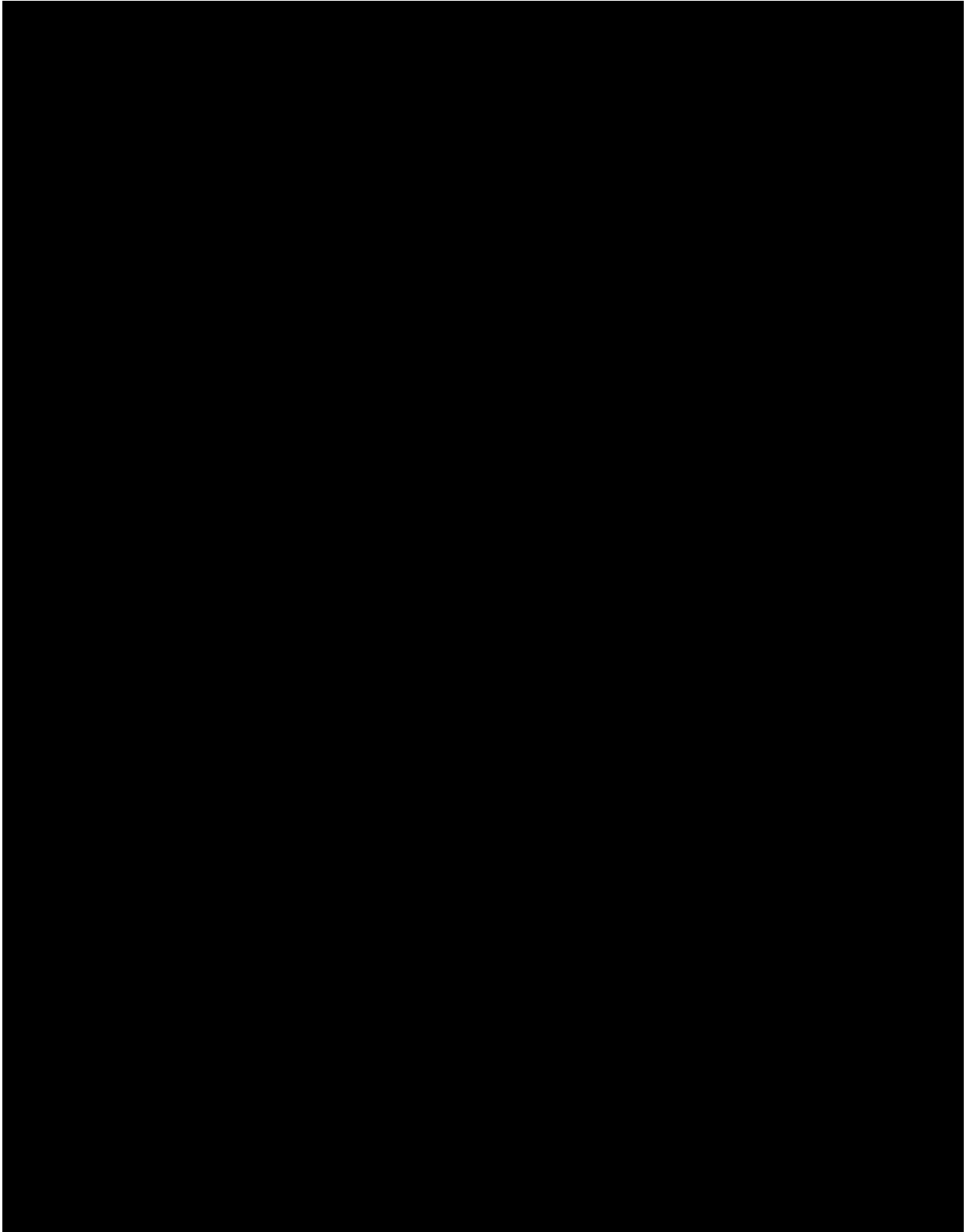
Total costs are benchmarked in the previous section. In this section, your fund's costs are compared on a line-item basis to your peers. This enables you to understand better why you may be a high or low cost fund and it also identifies and quantifies major cost differences that may warrant further investigation.

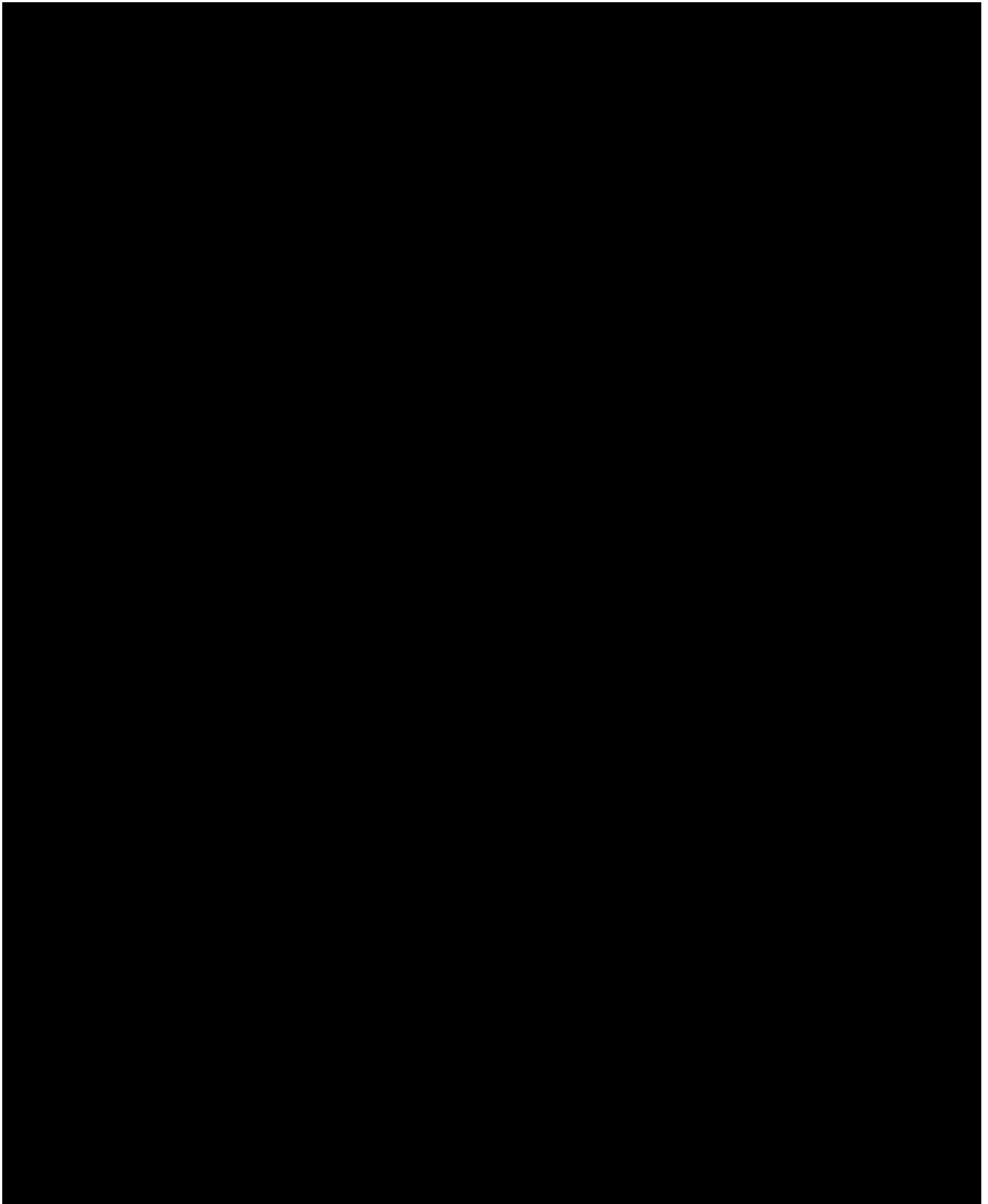
The 25th to 75th percentile range is the most relevant since higher and lower values may include outliers caused by unusual circumstances, such as performance-based fees. Count refers to the number of funds in your peer group that have costs in this category. It enables you to gauge the statistical significance.

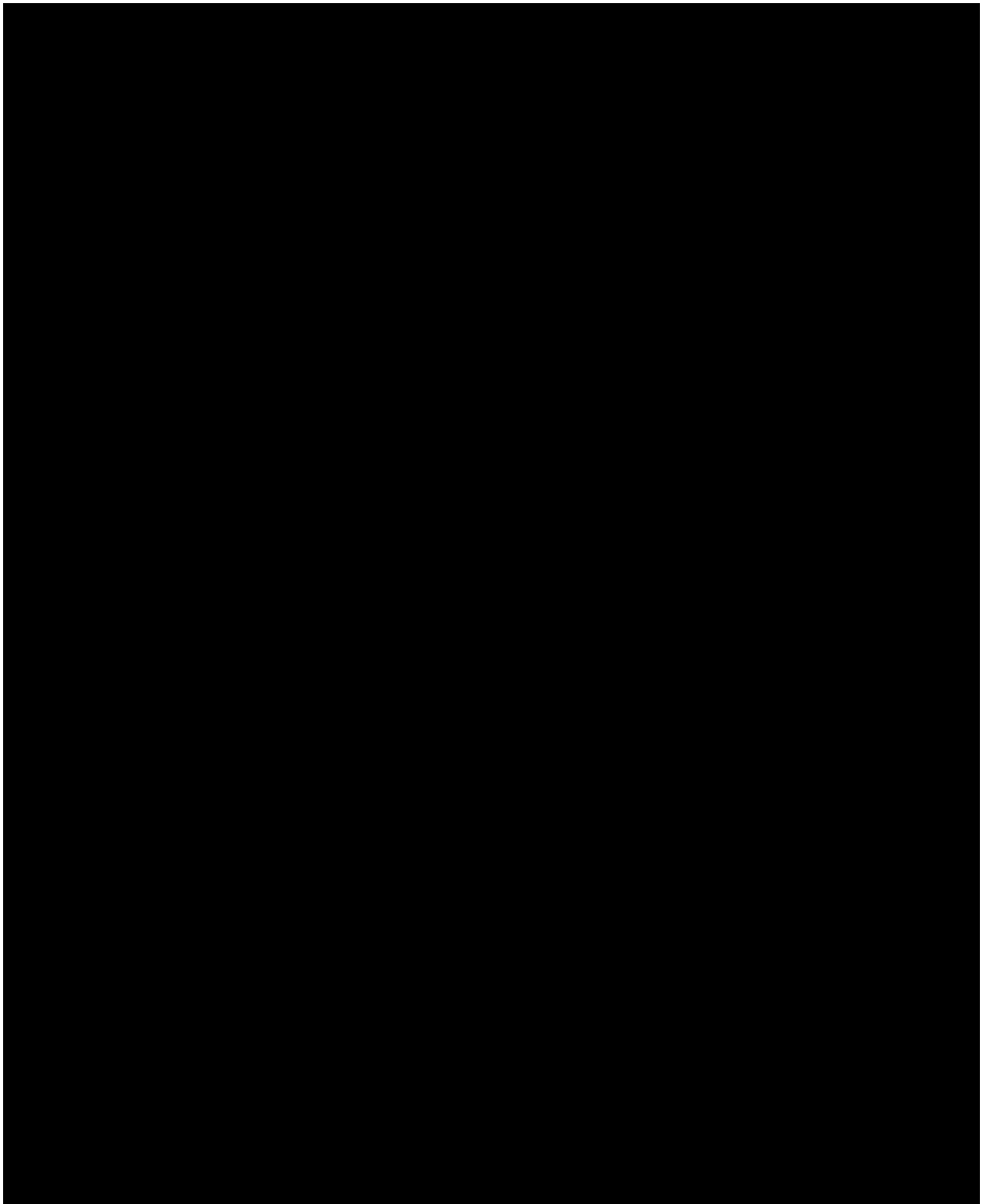


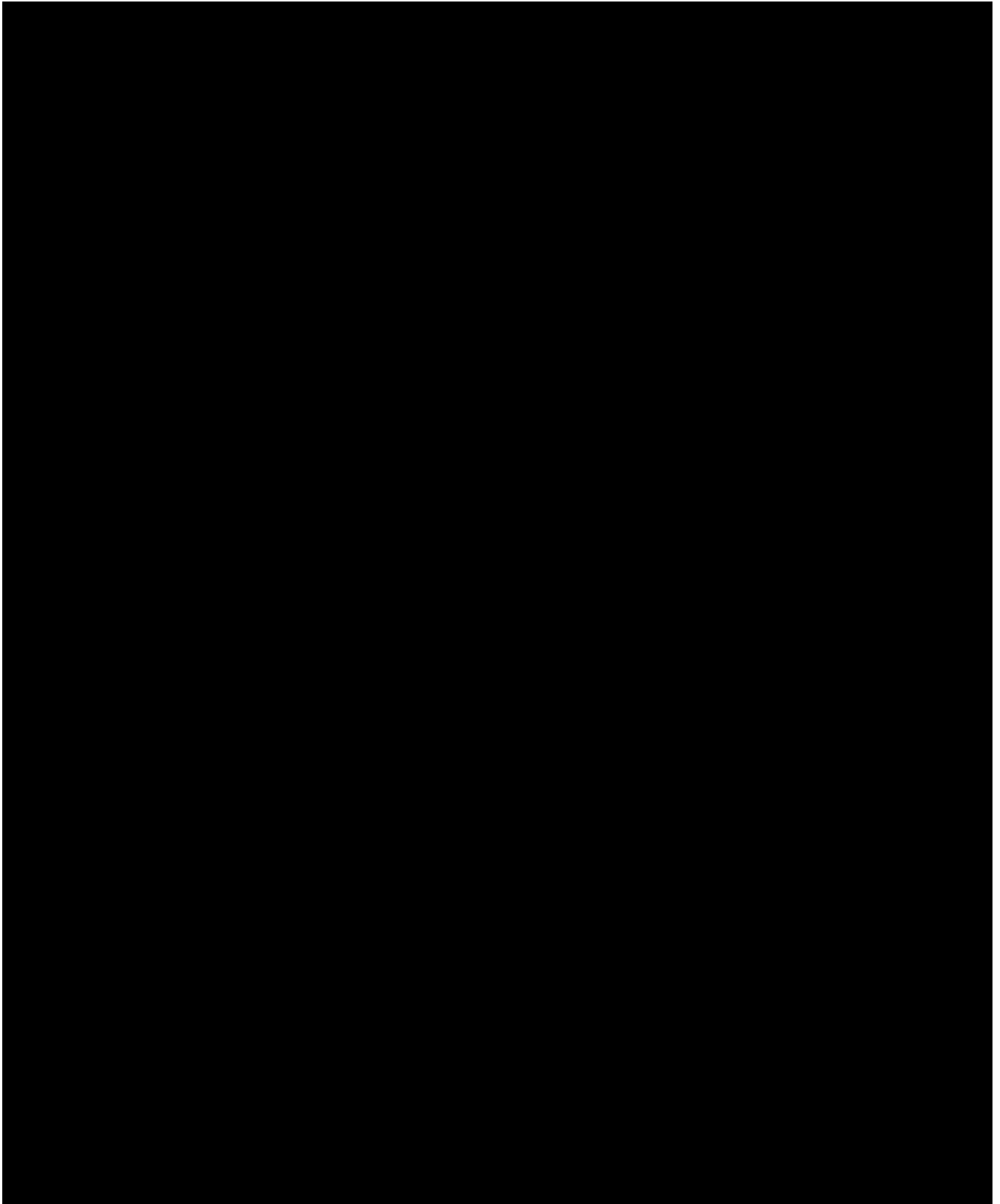


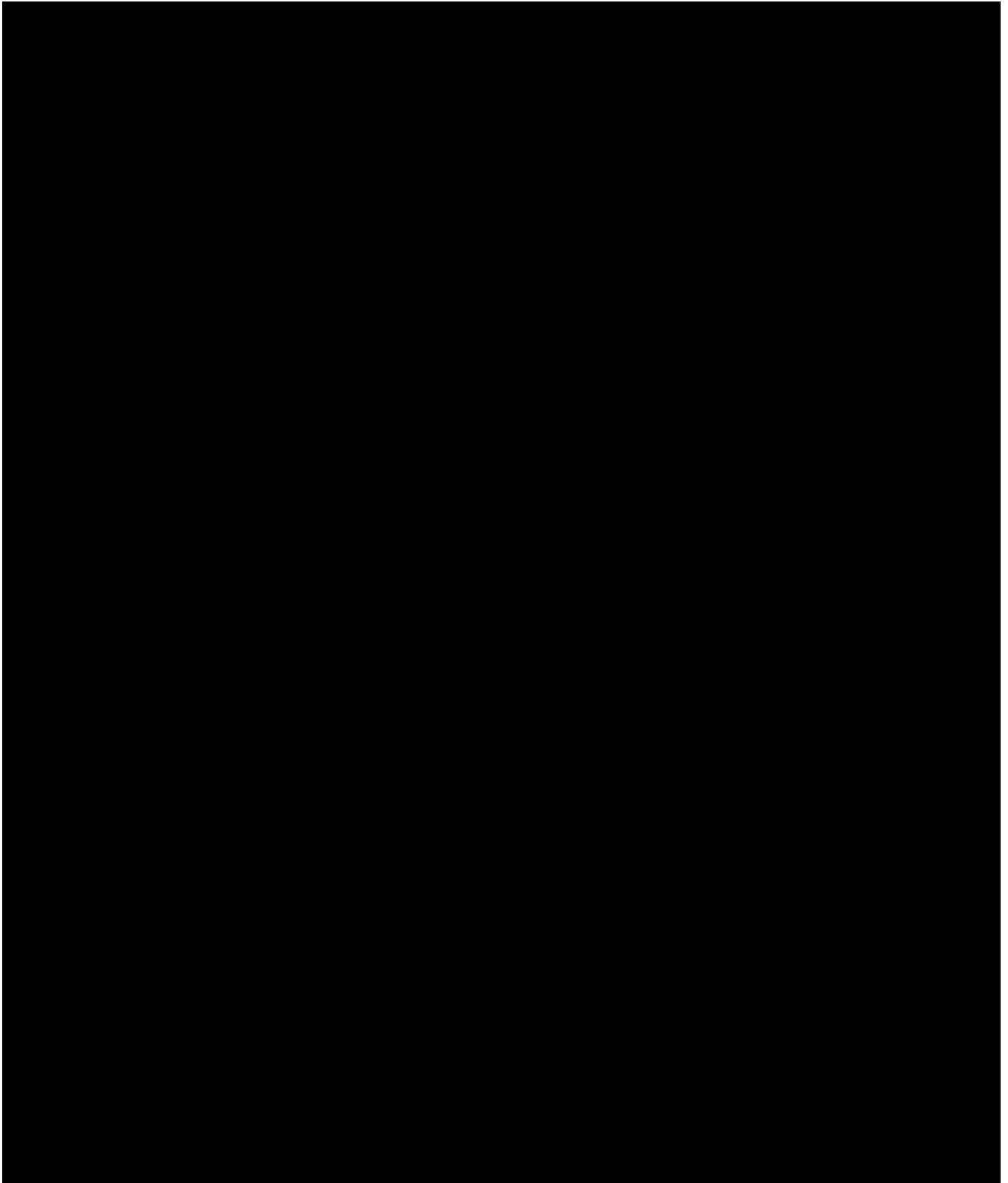


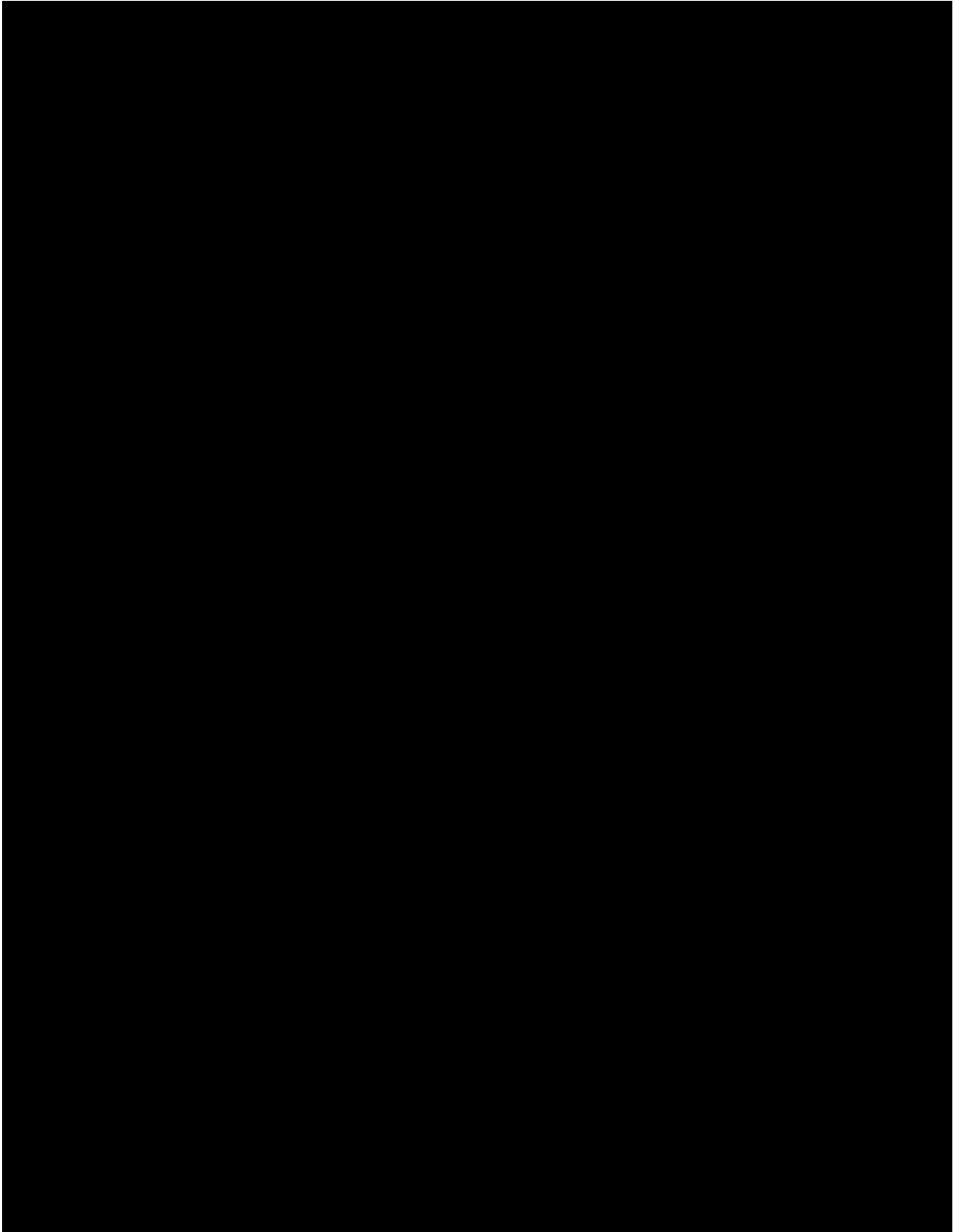


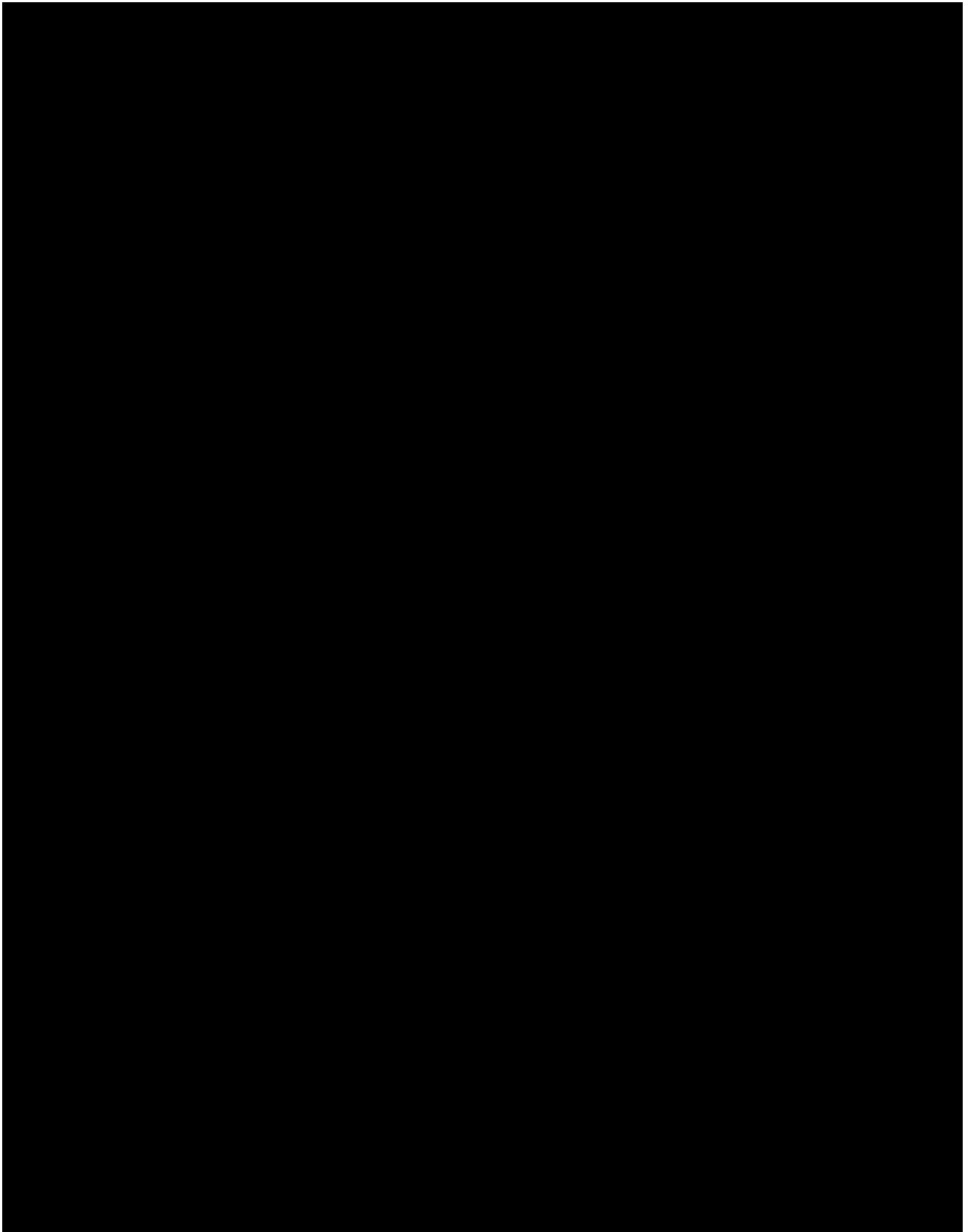


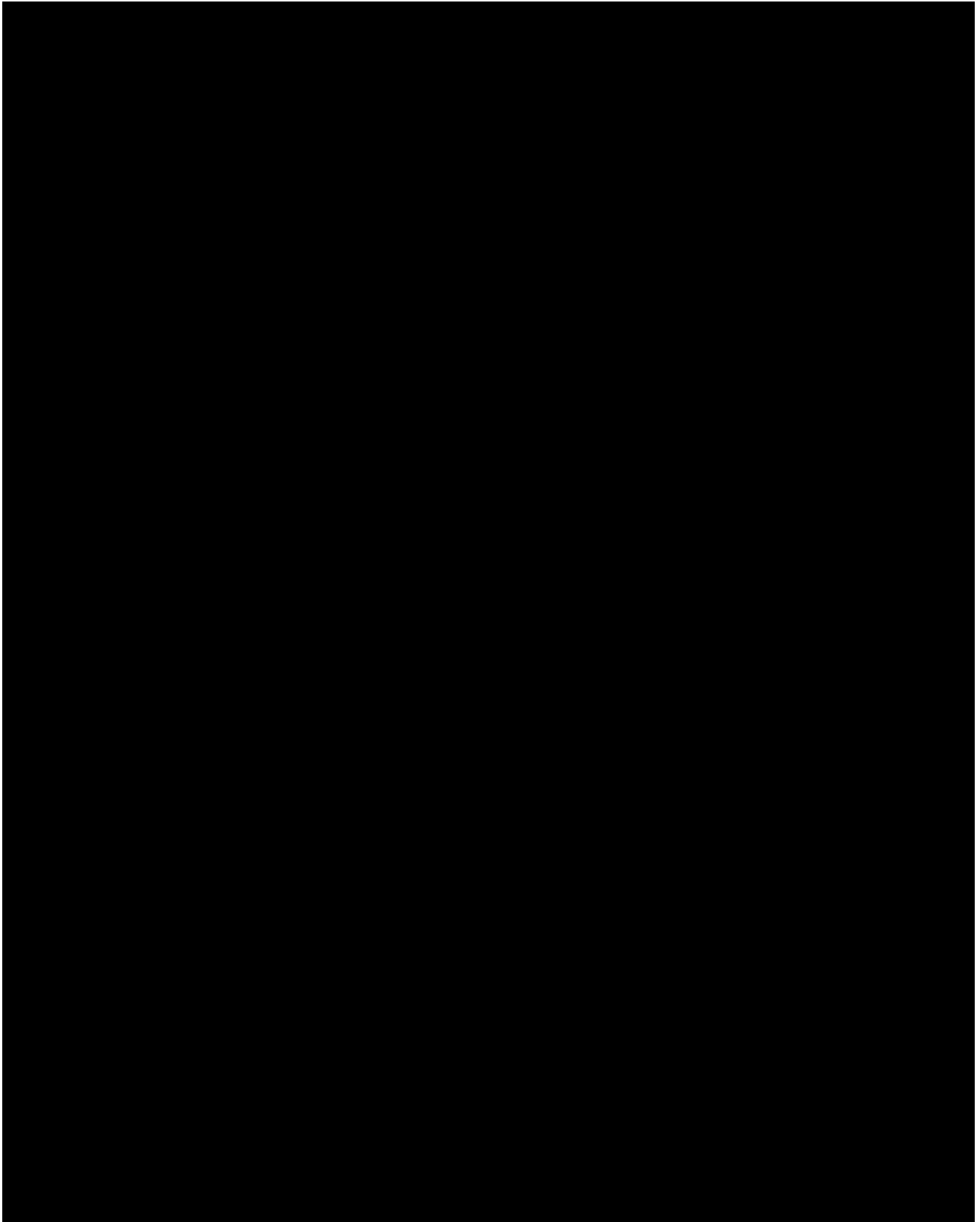


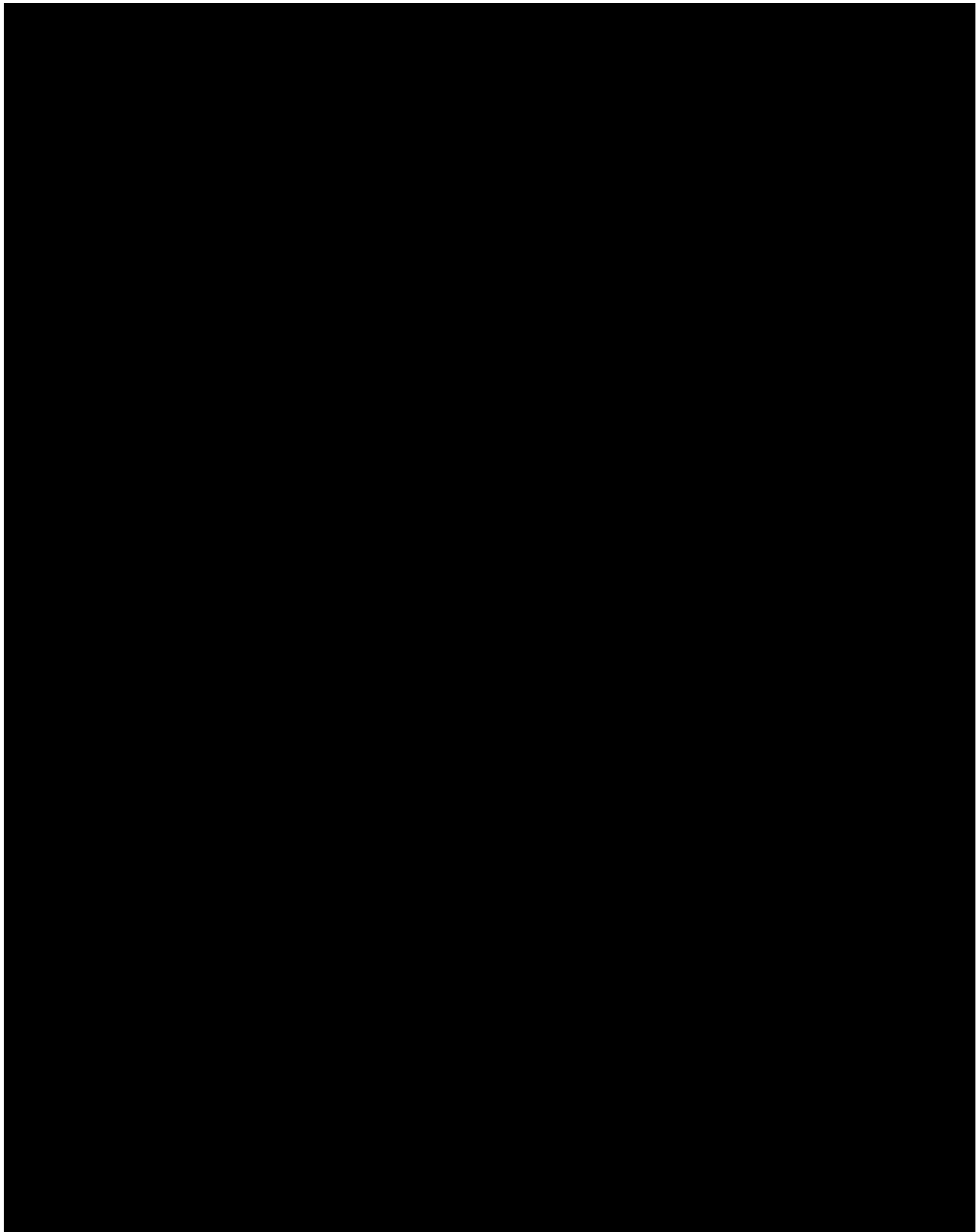


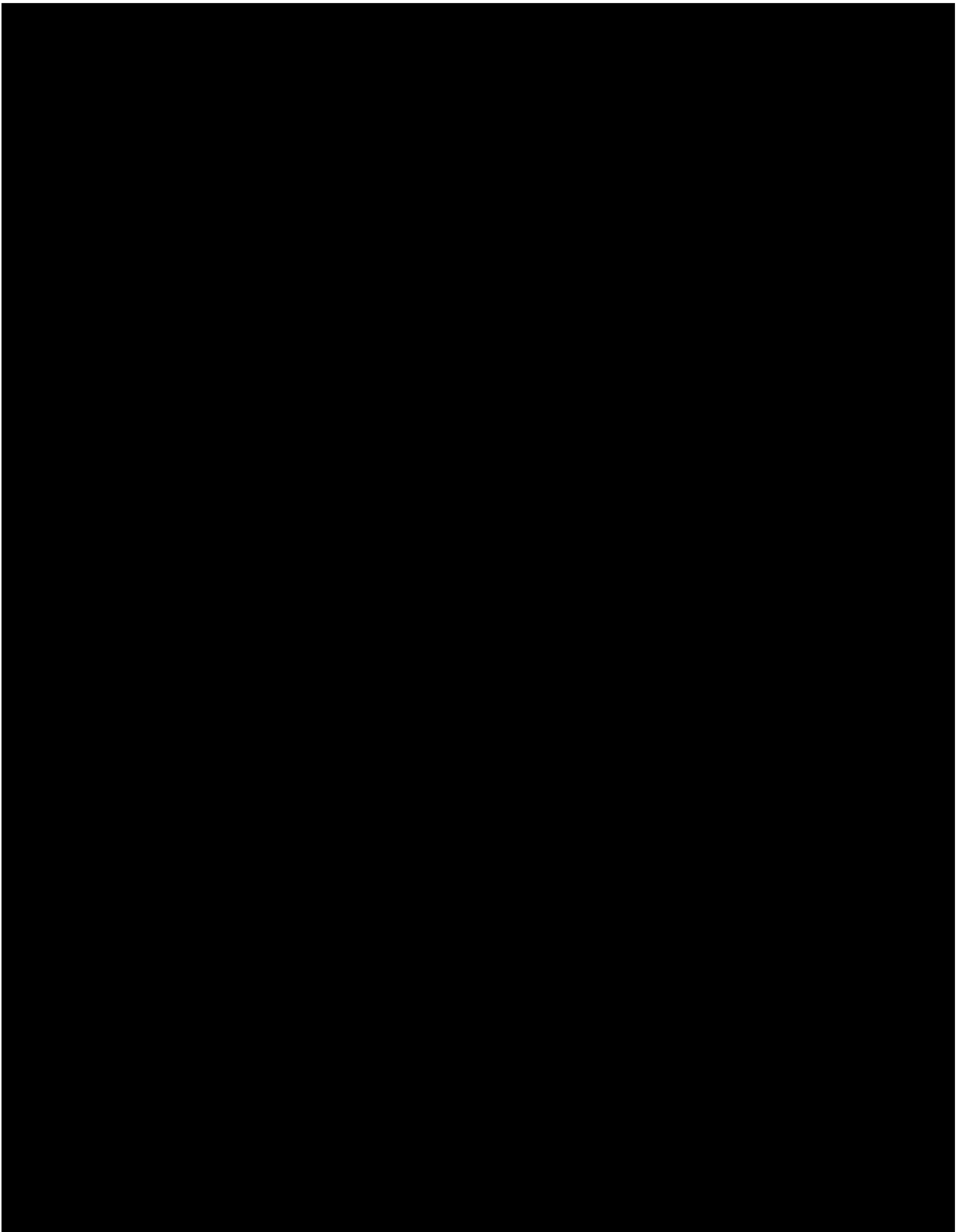


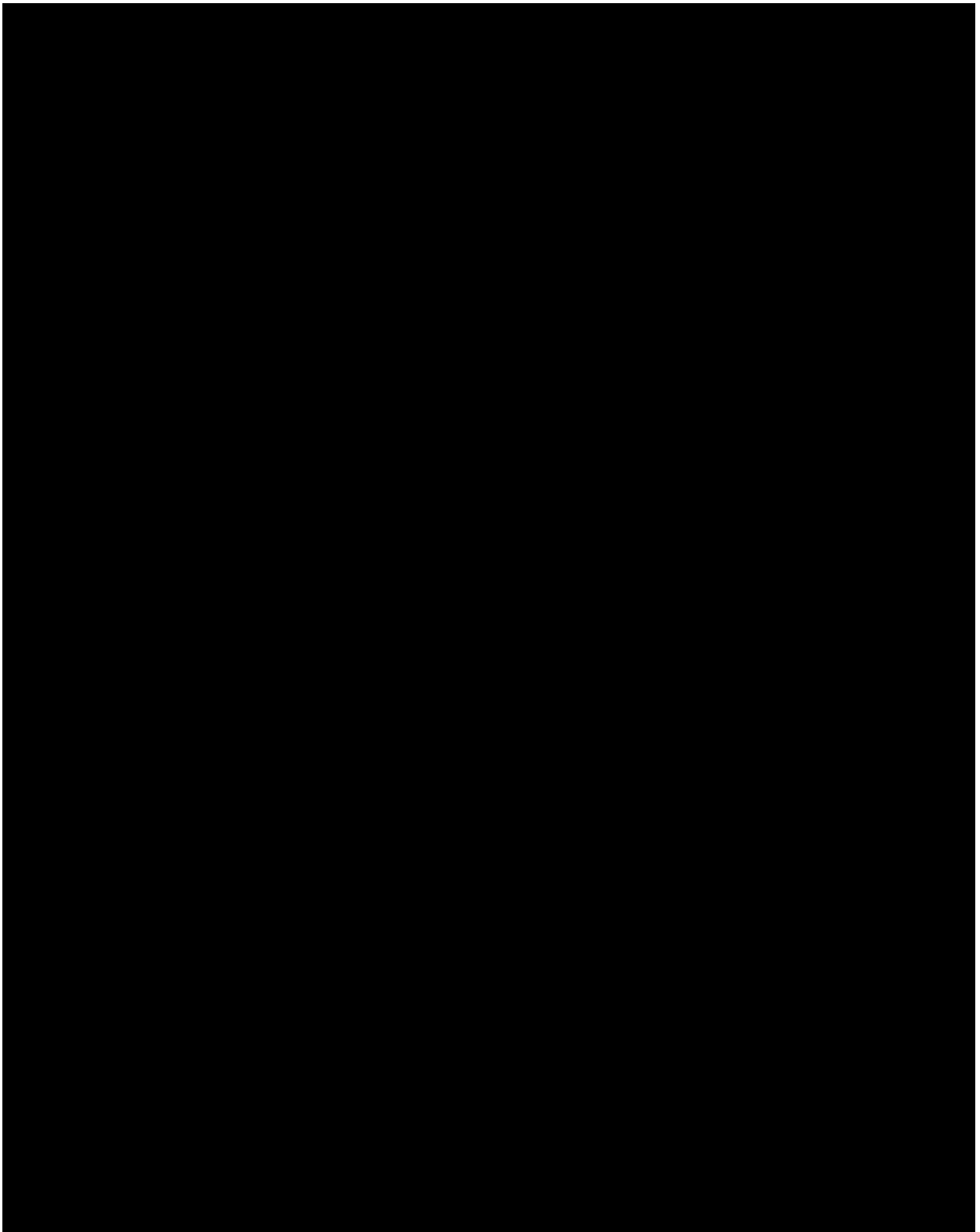


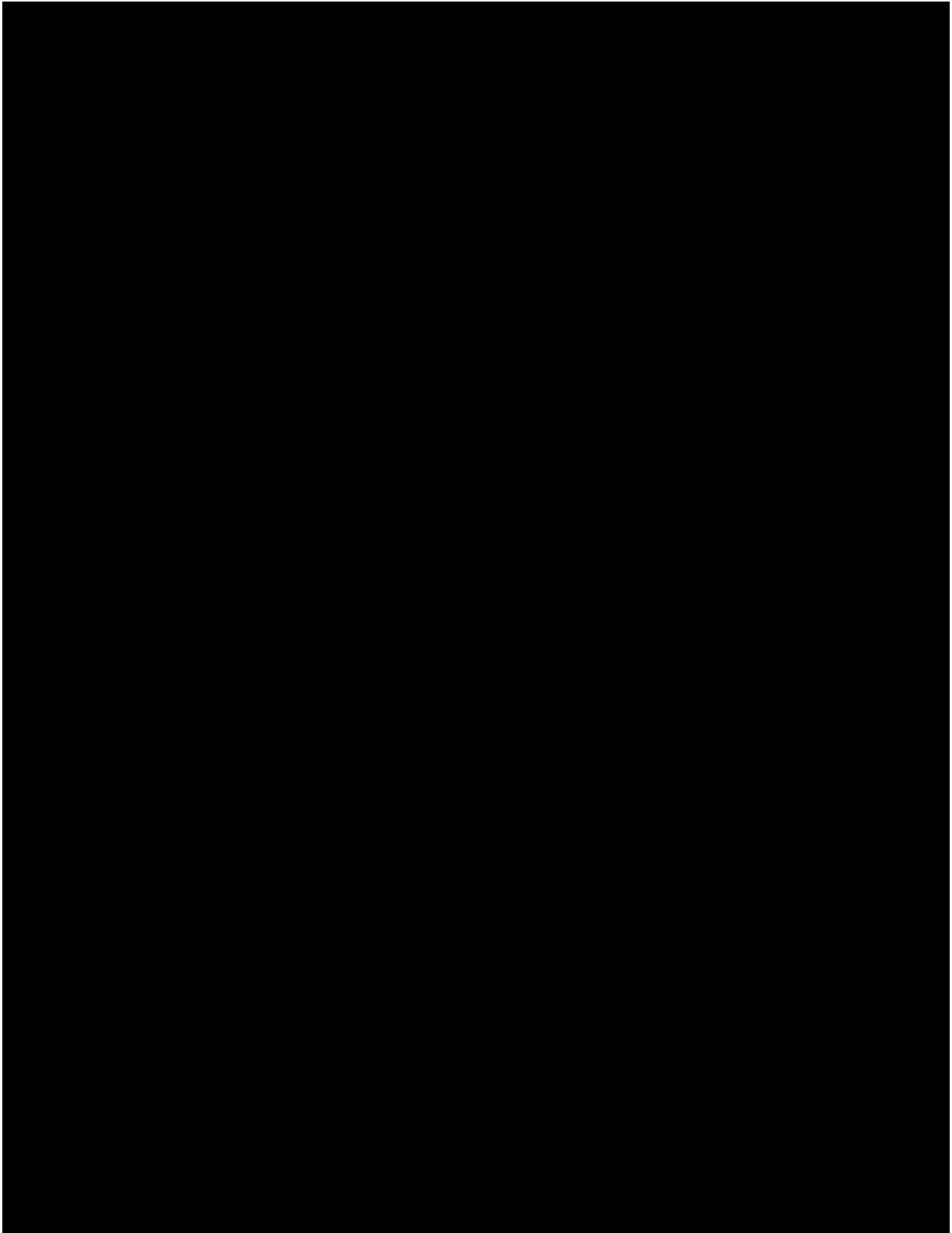


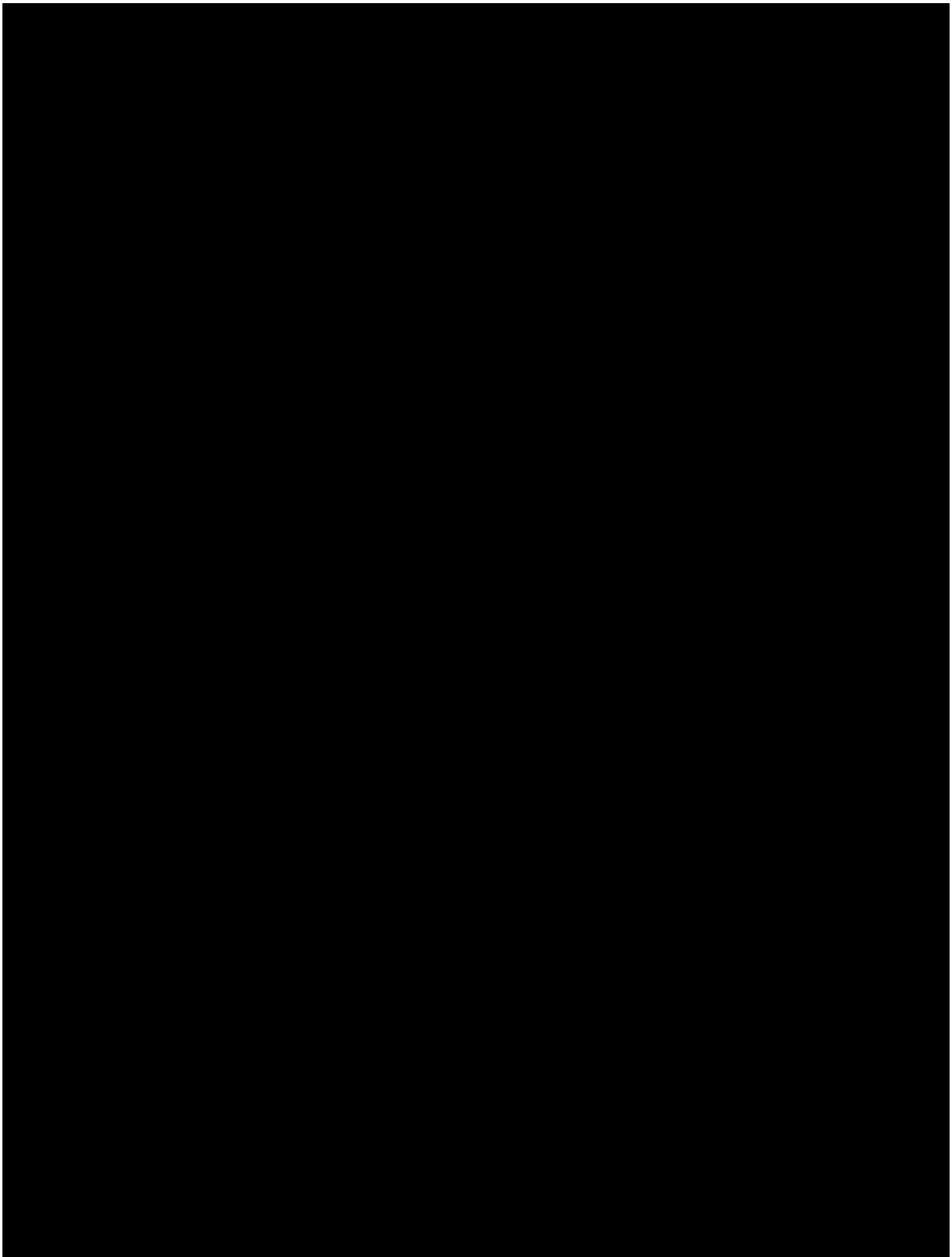


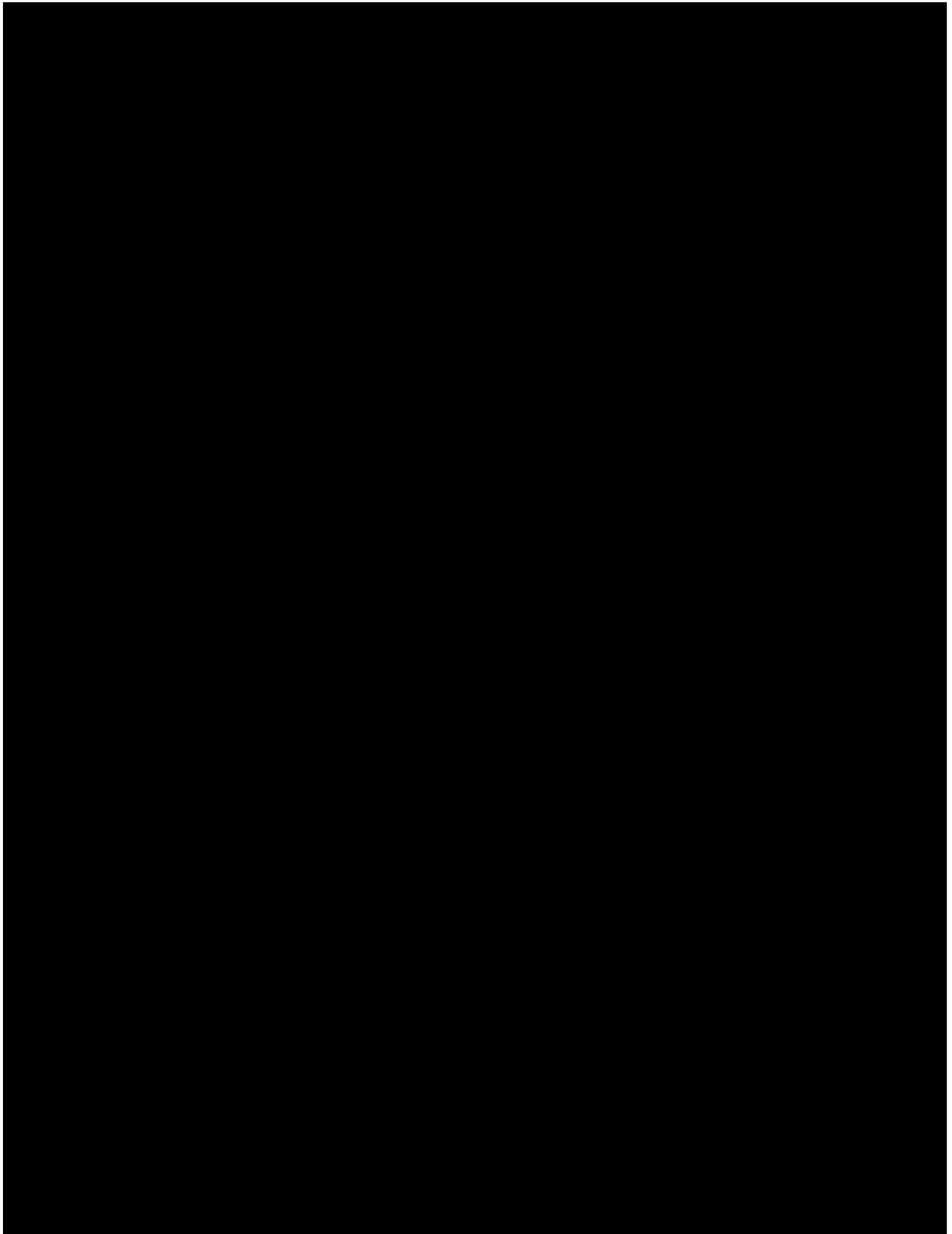


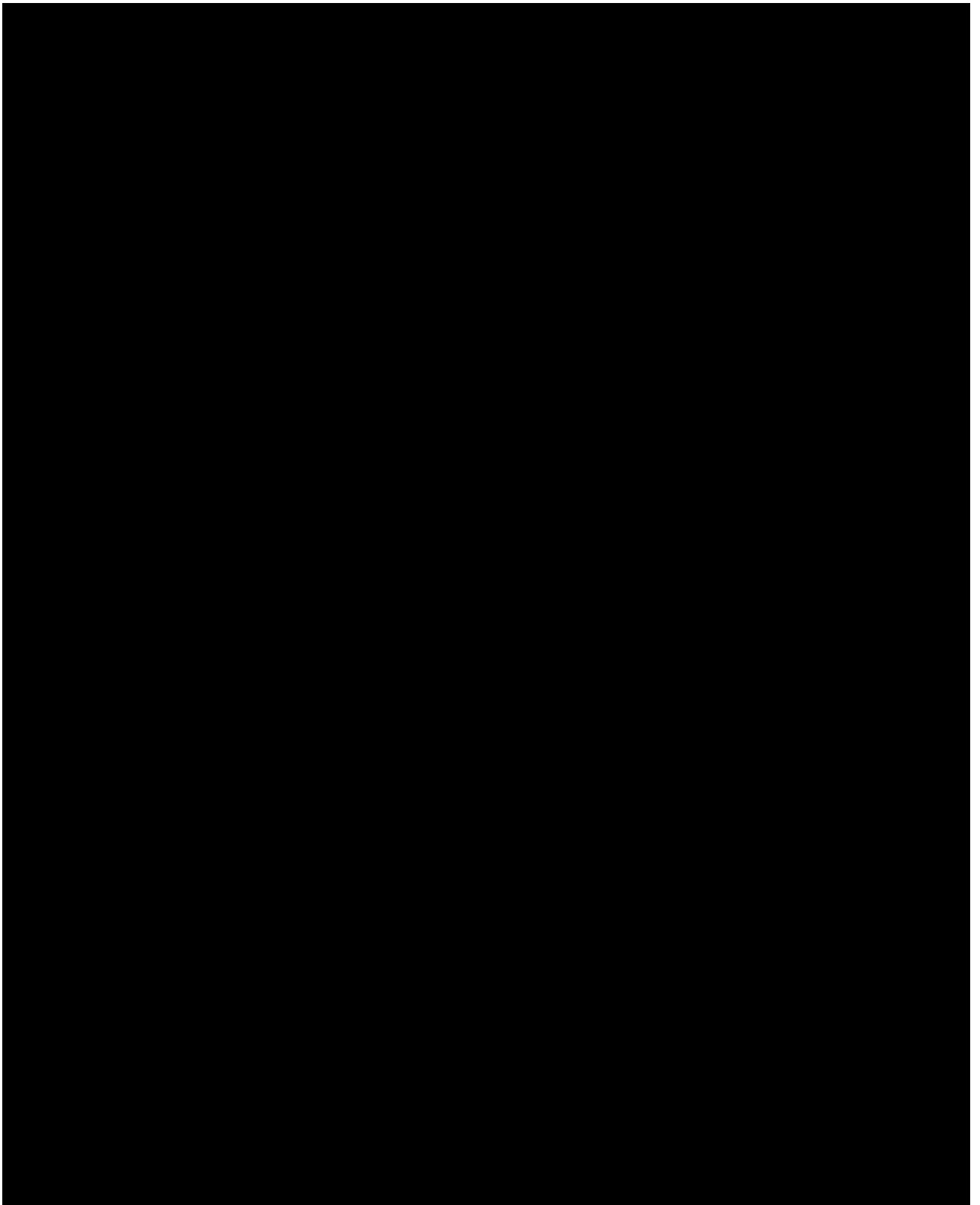


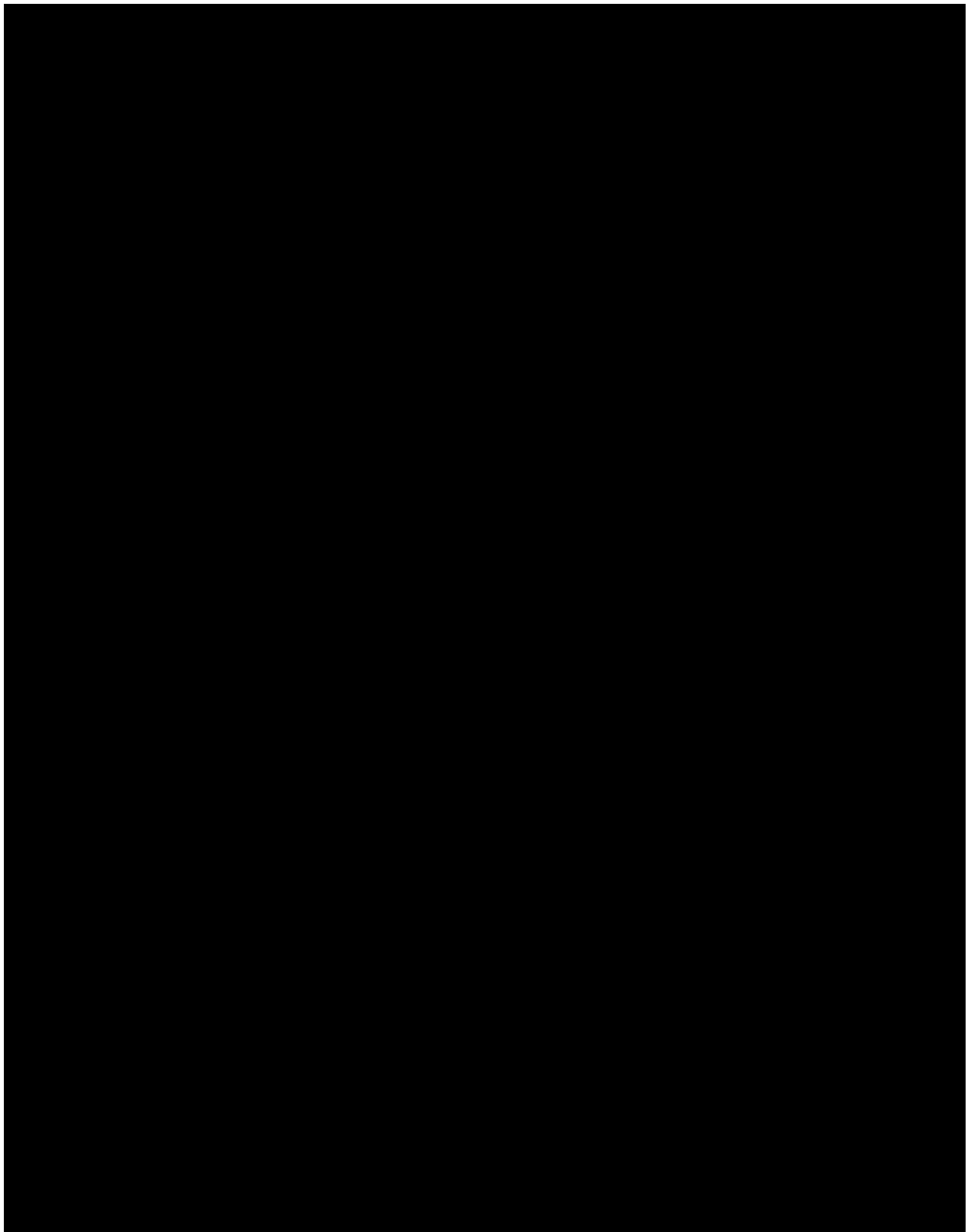


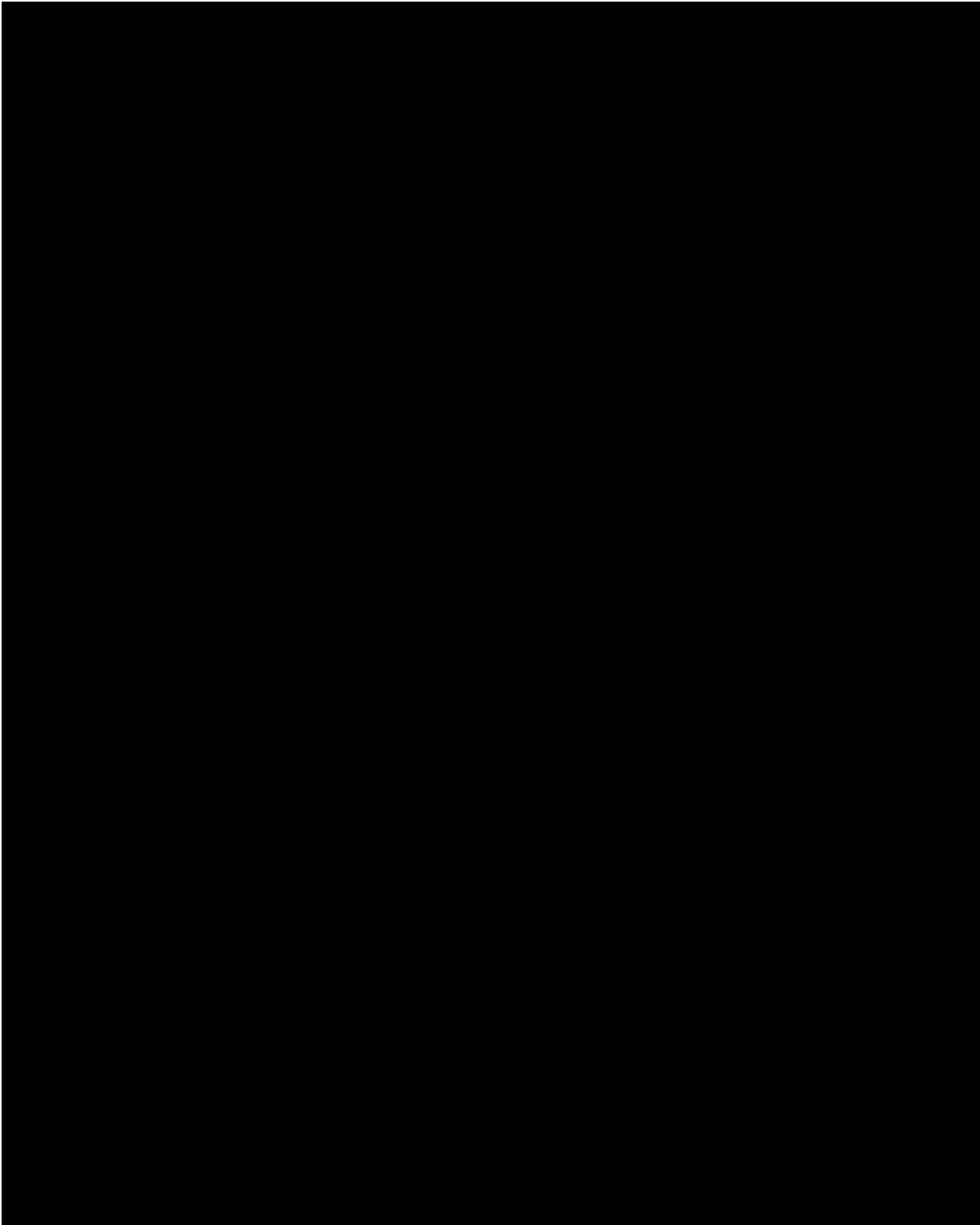


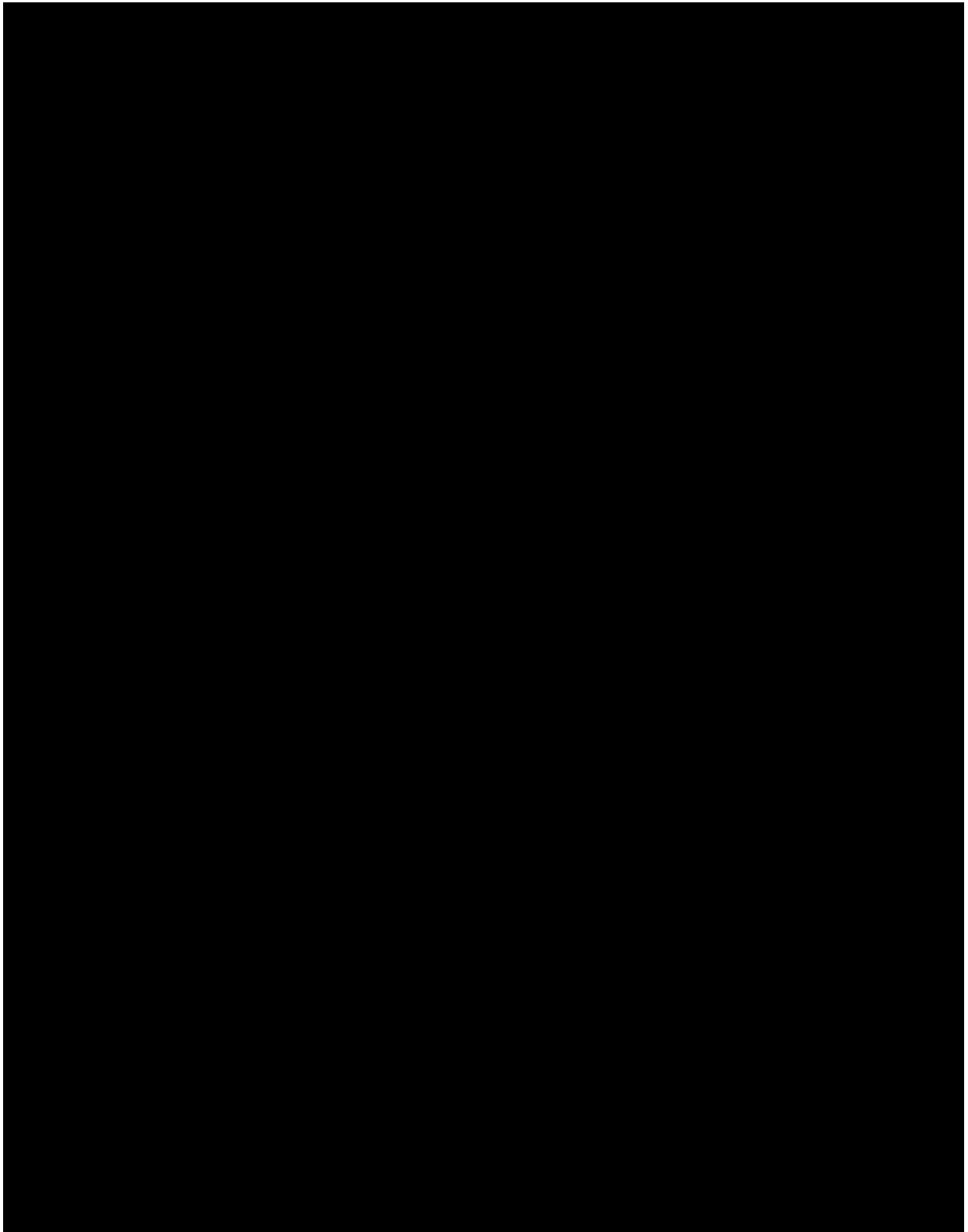


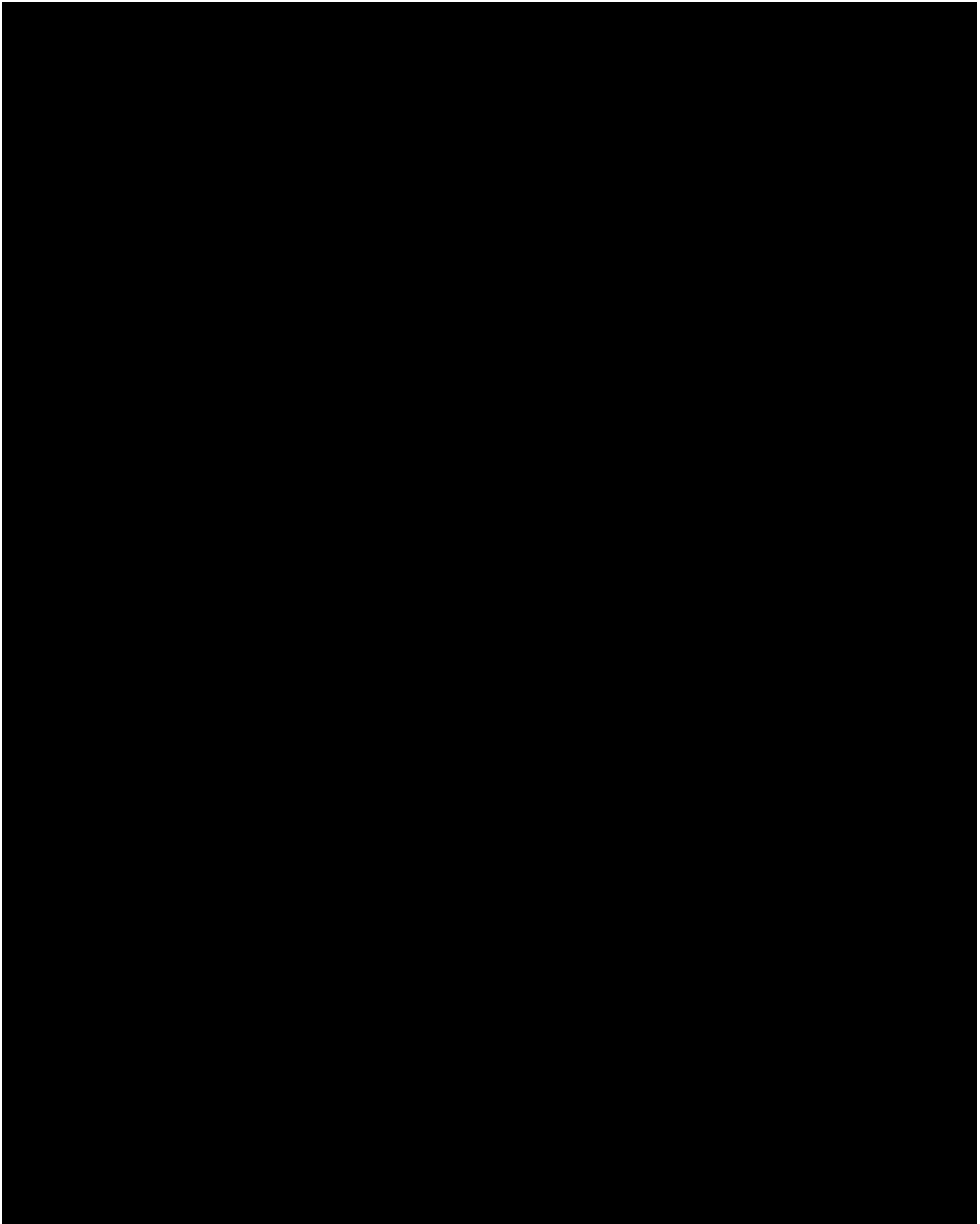


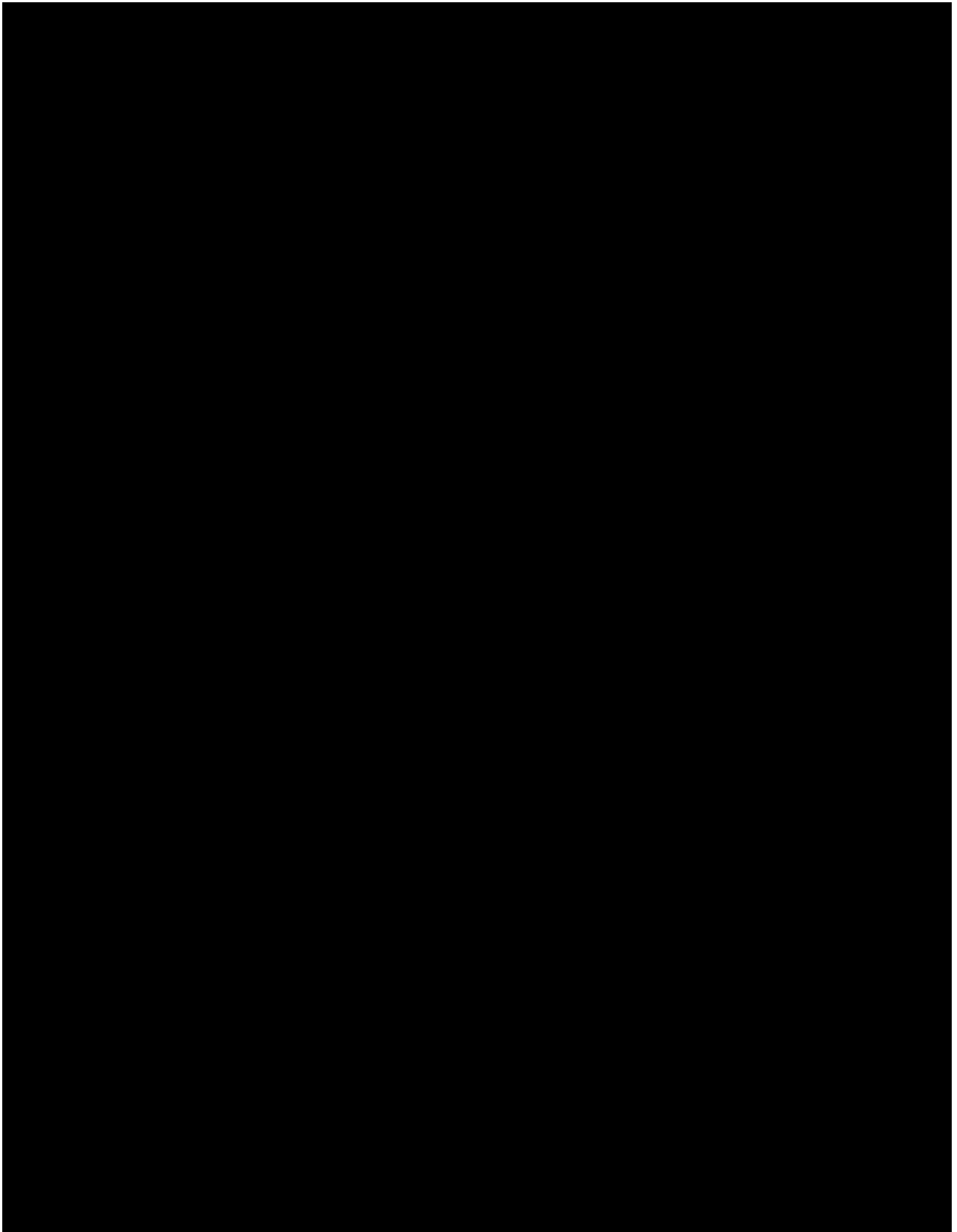


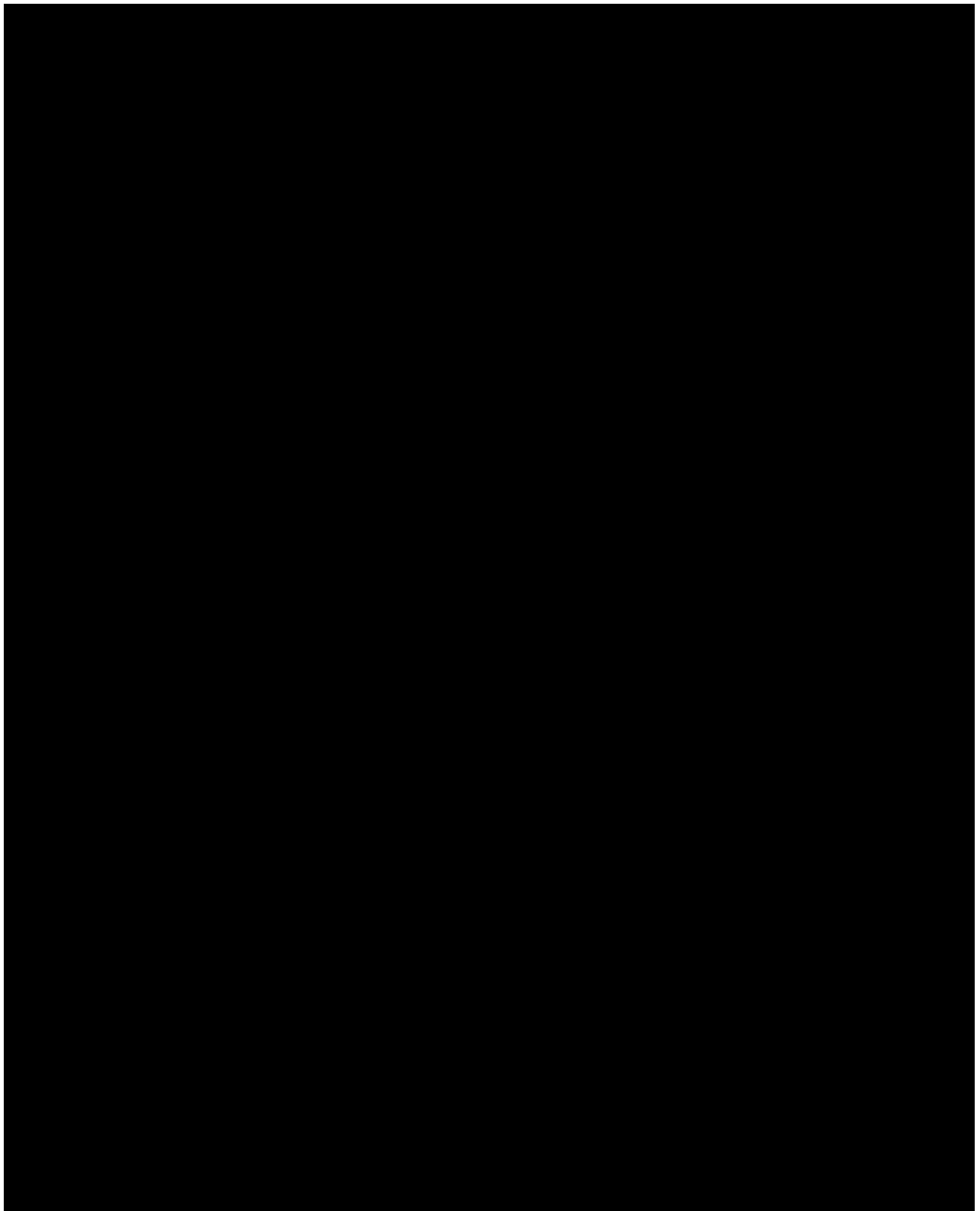


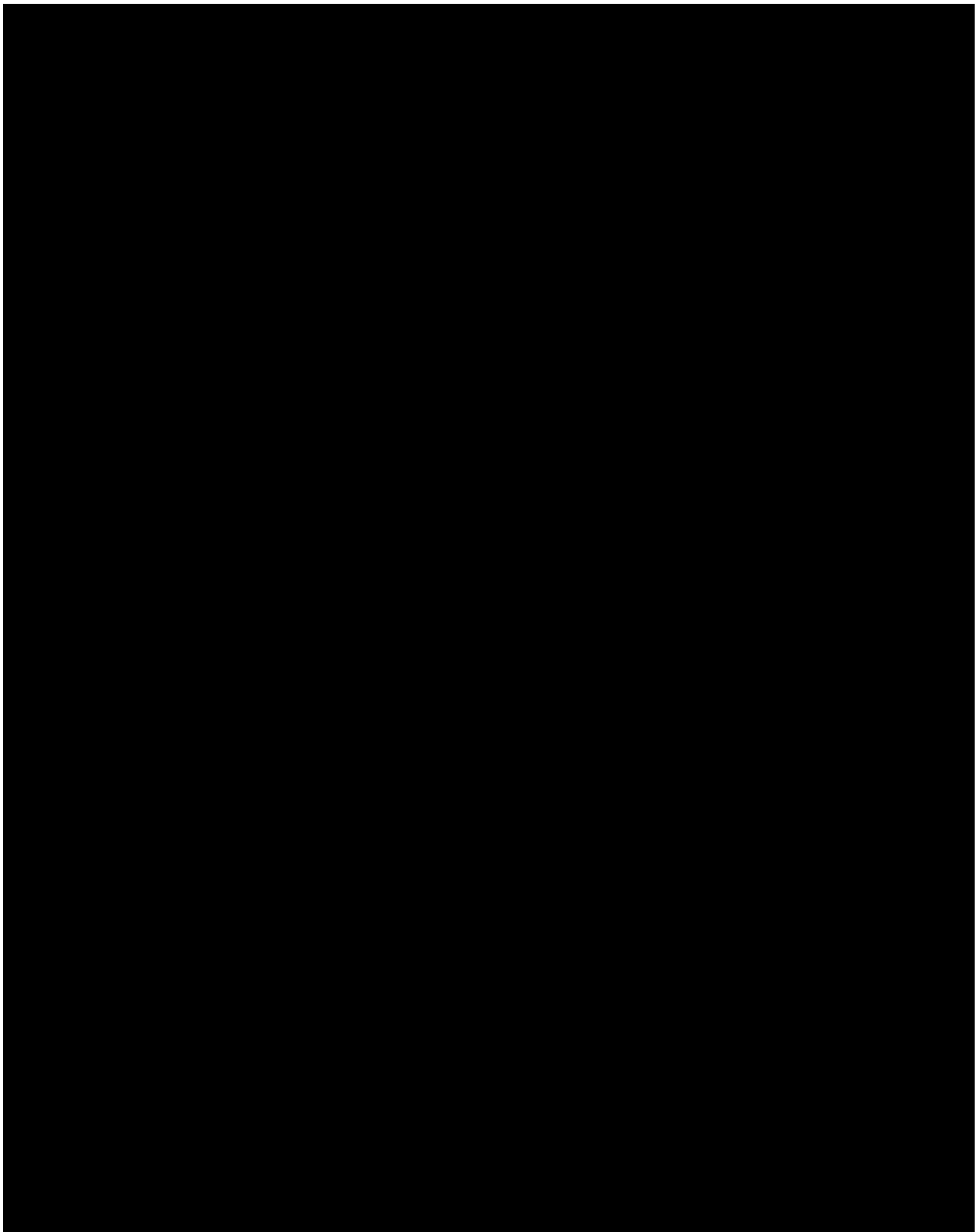


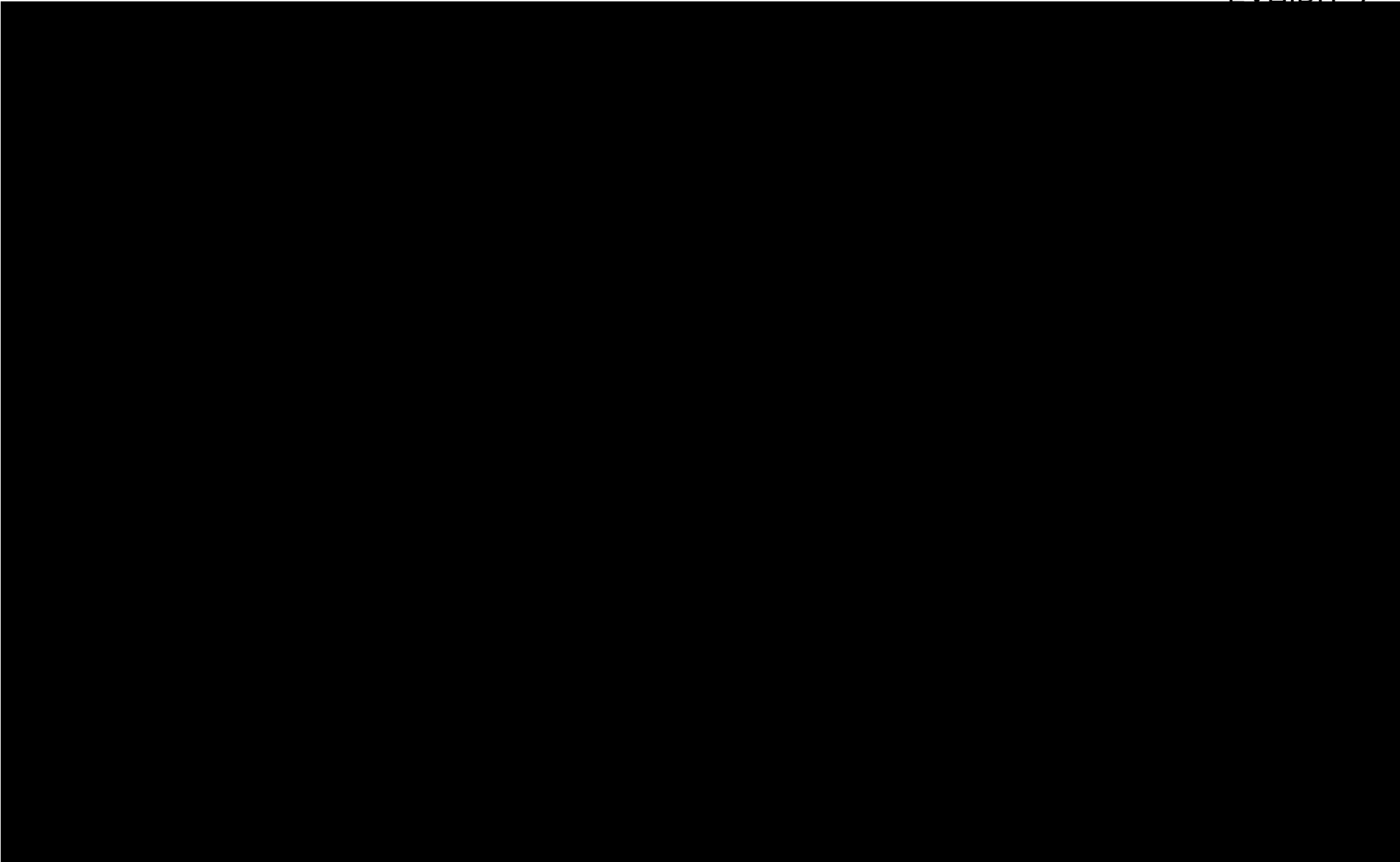


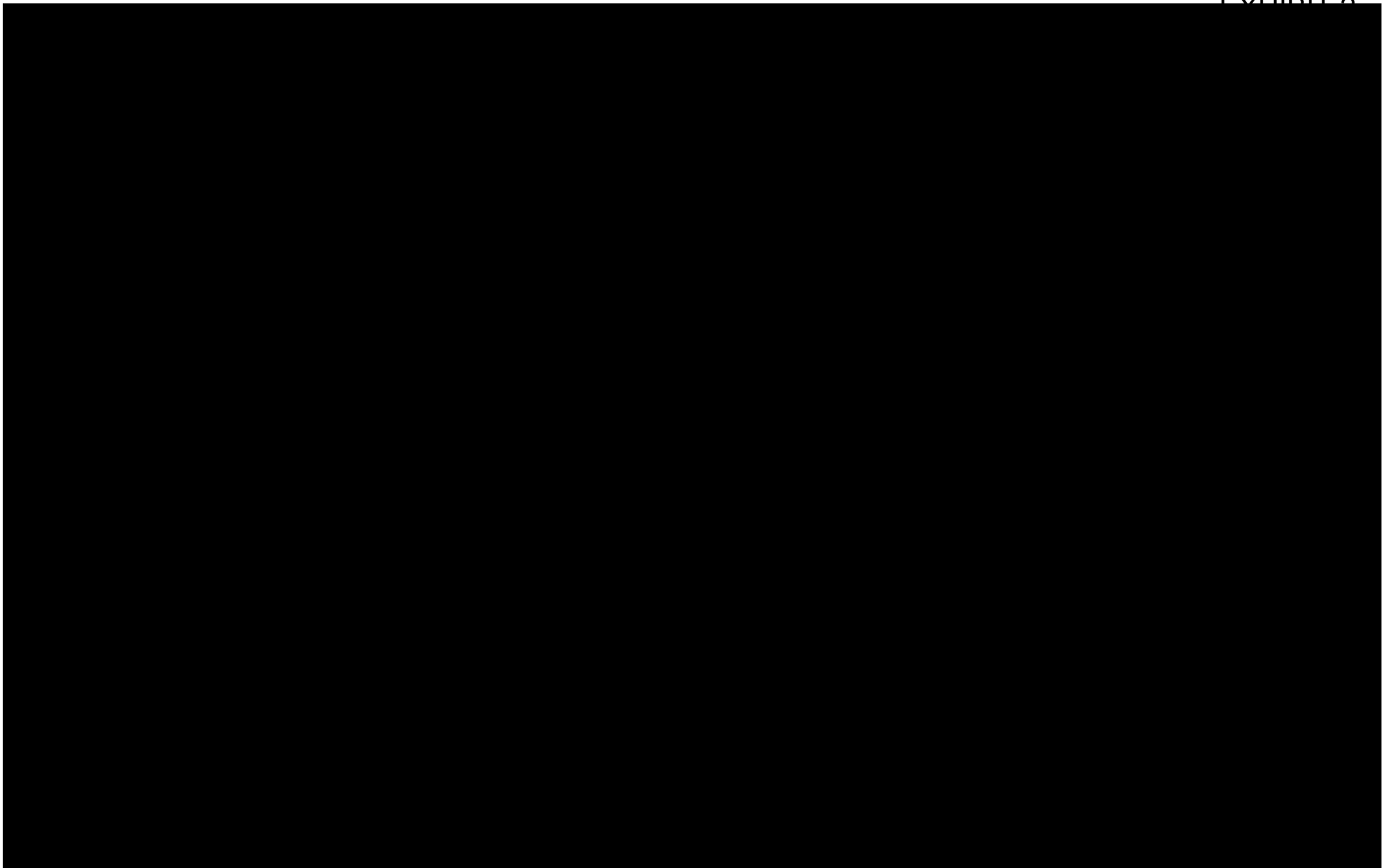


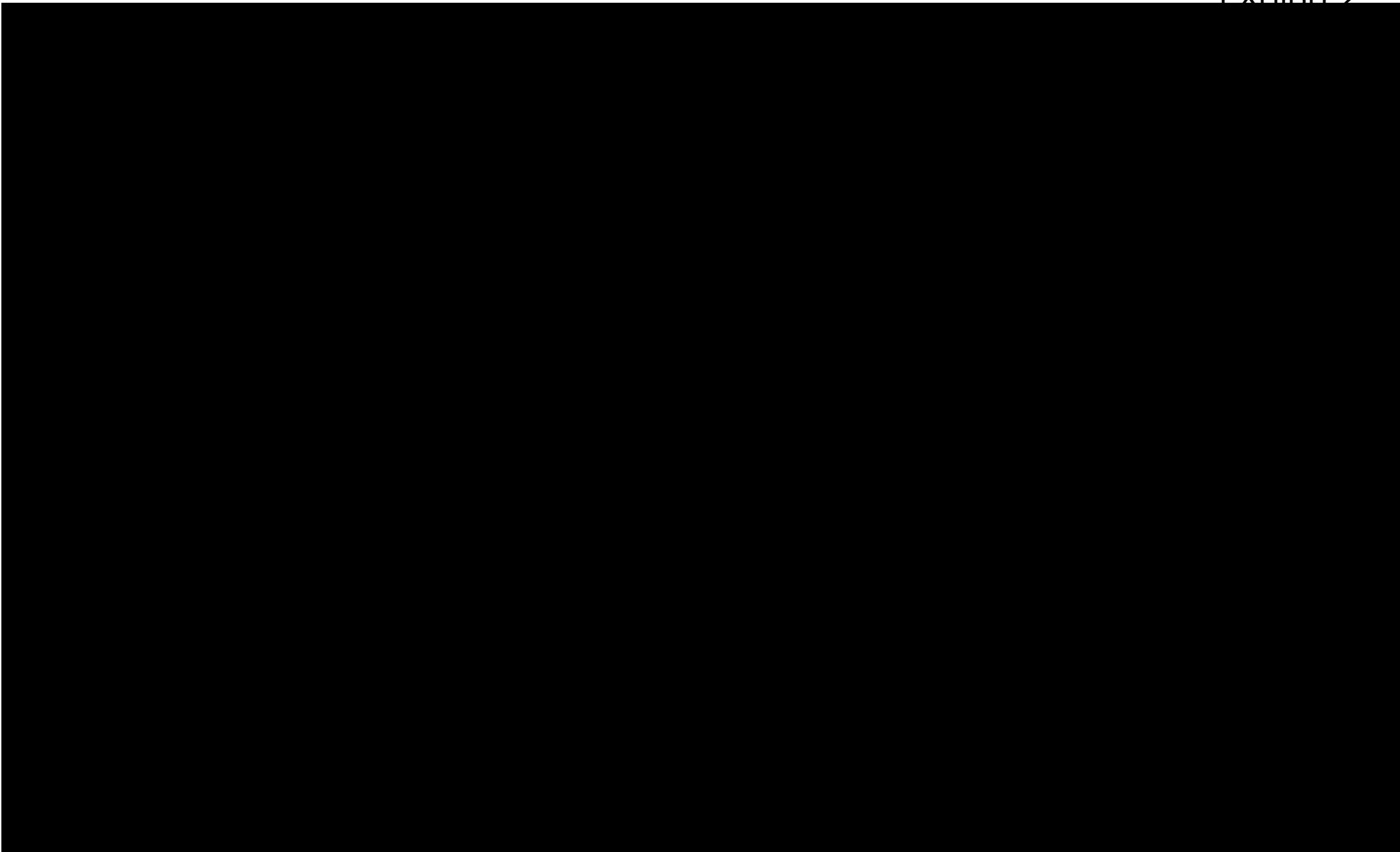


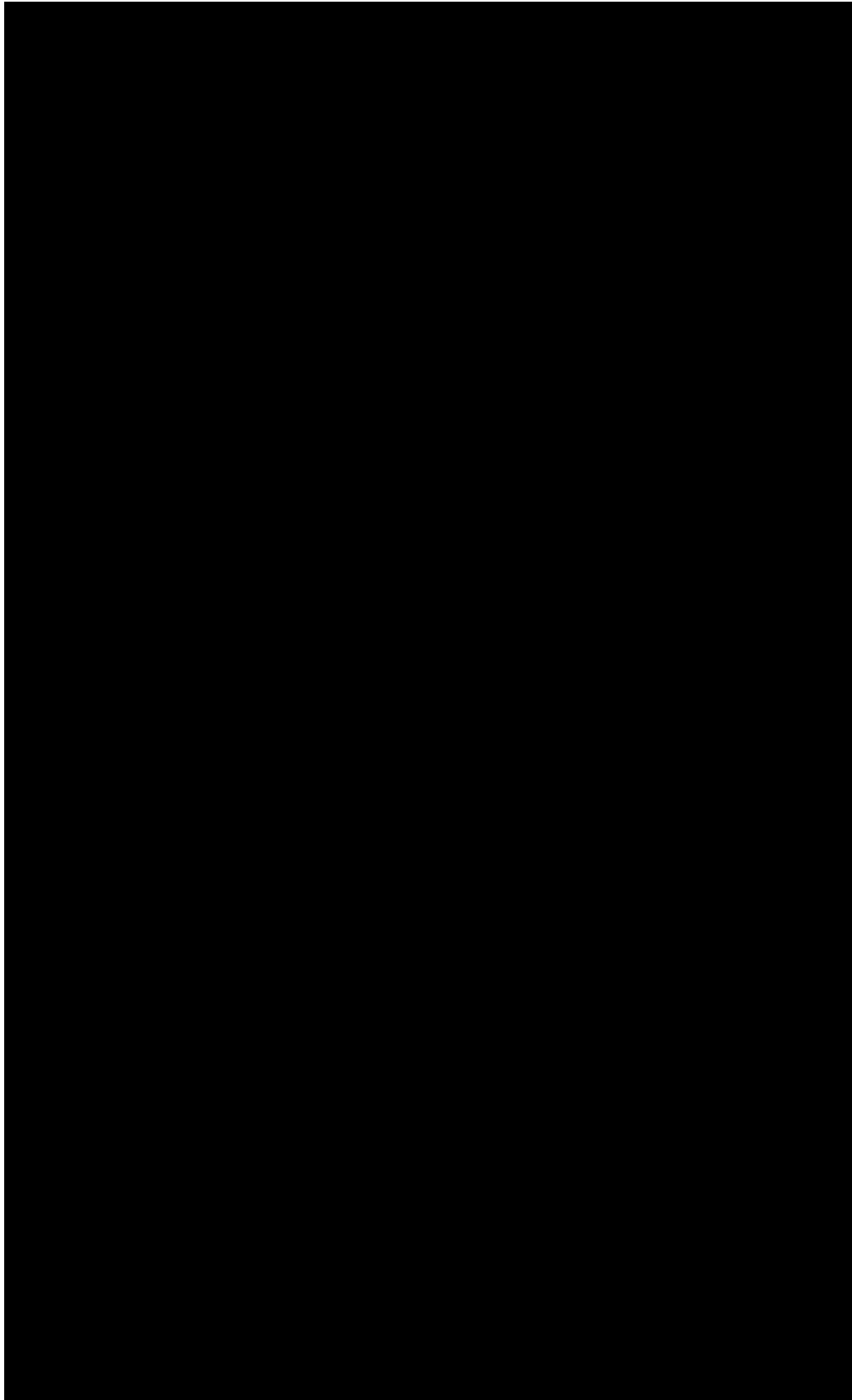


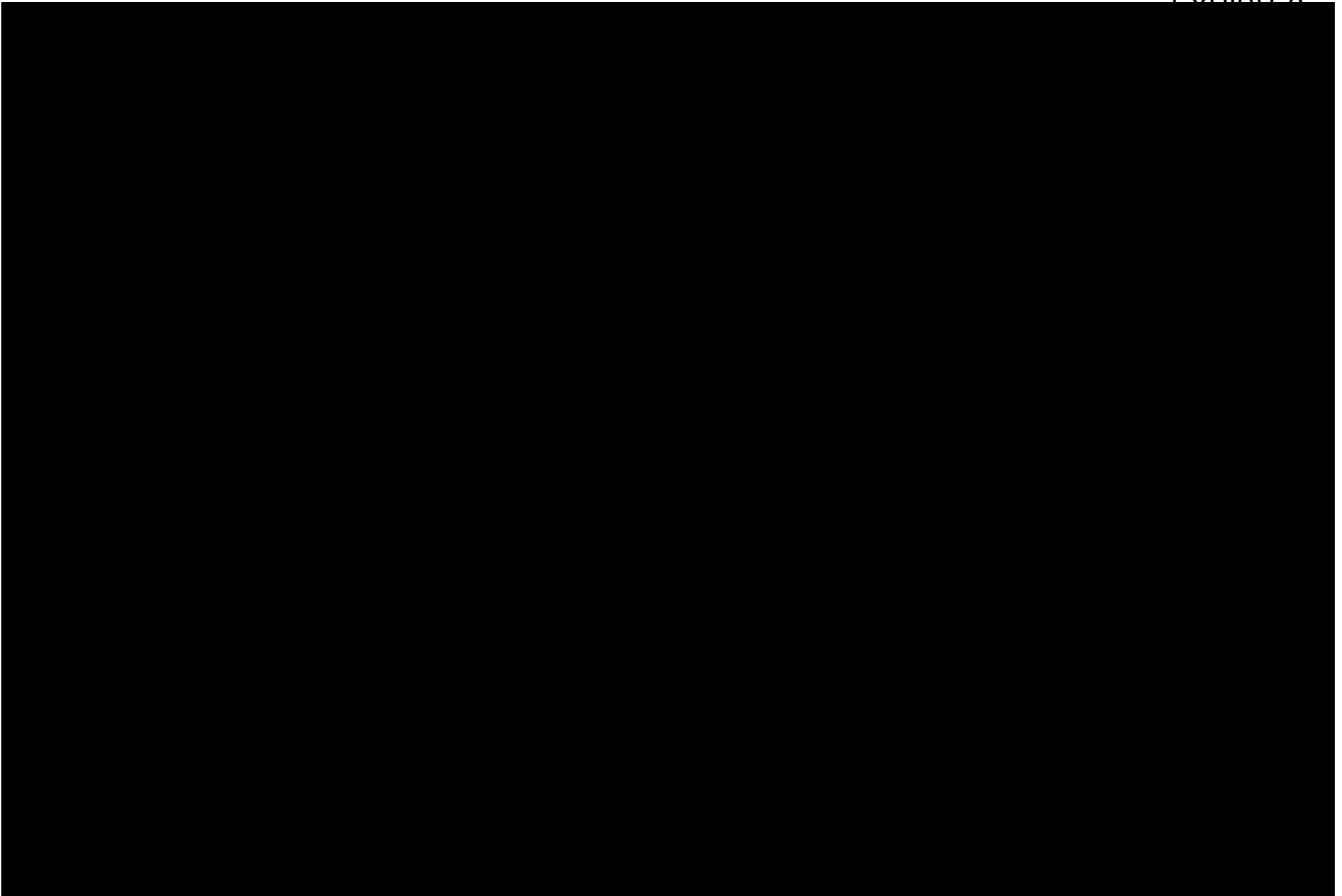


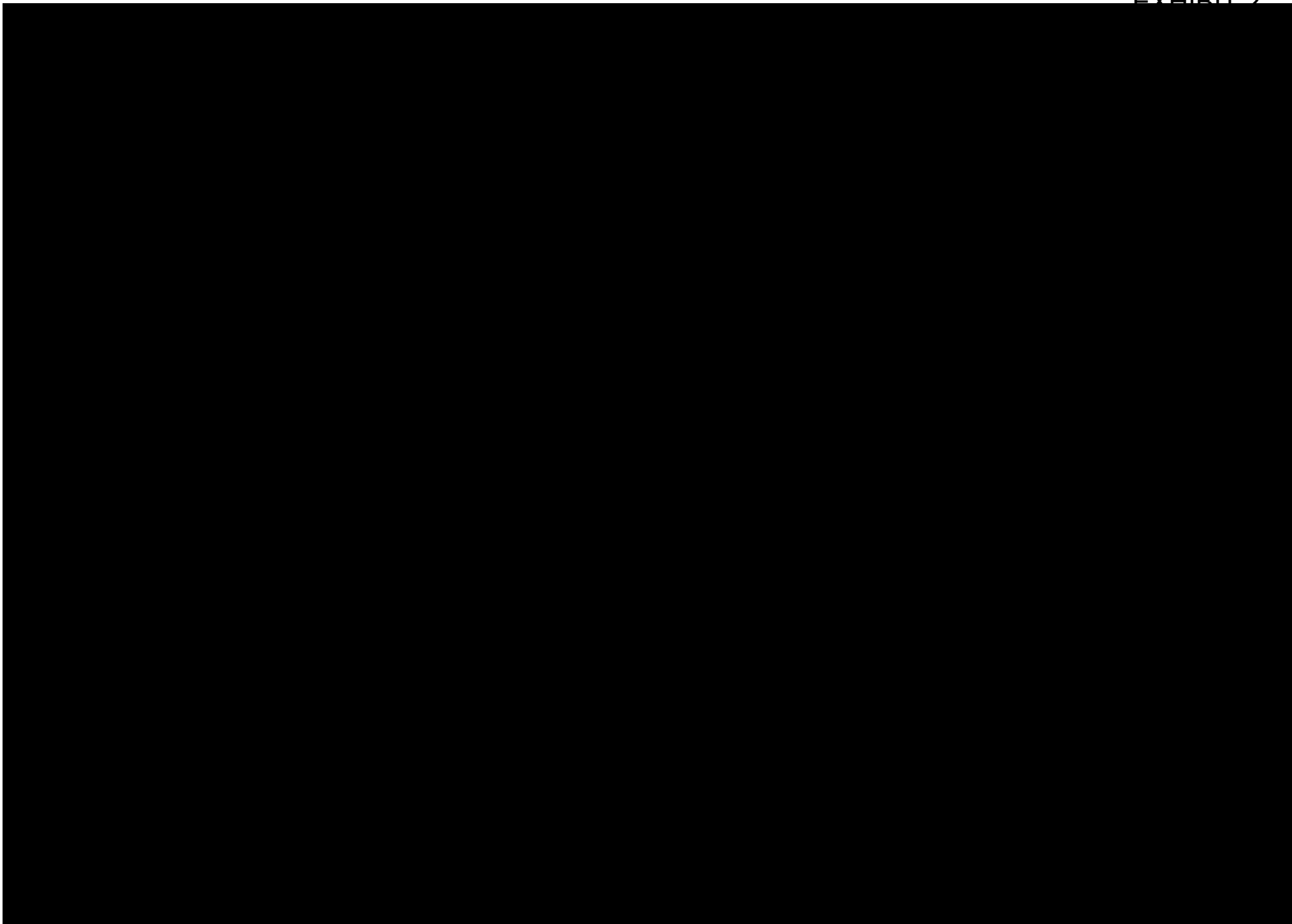


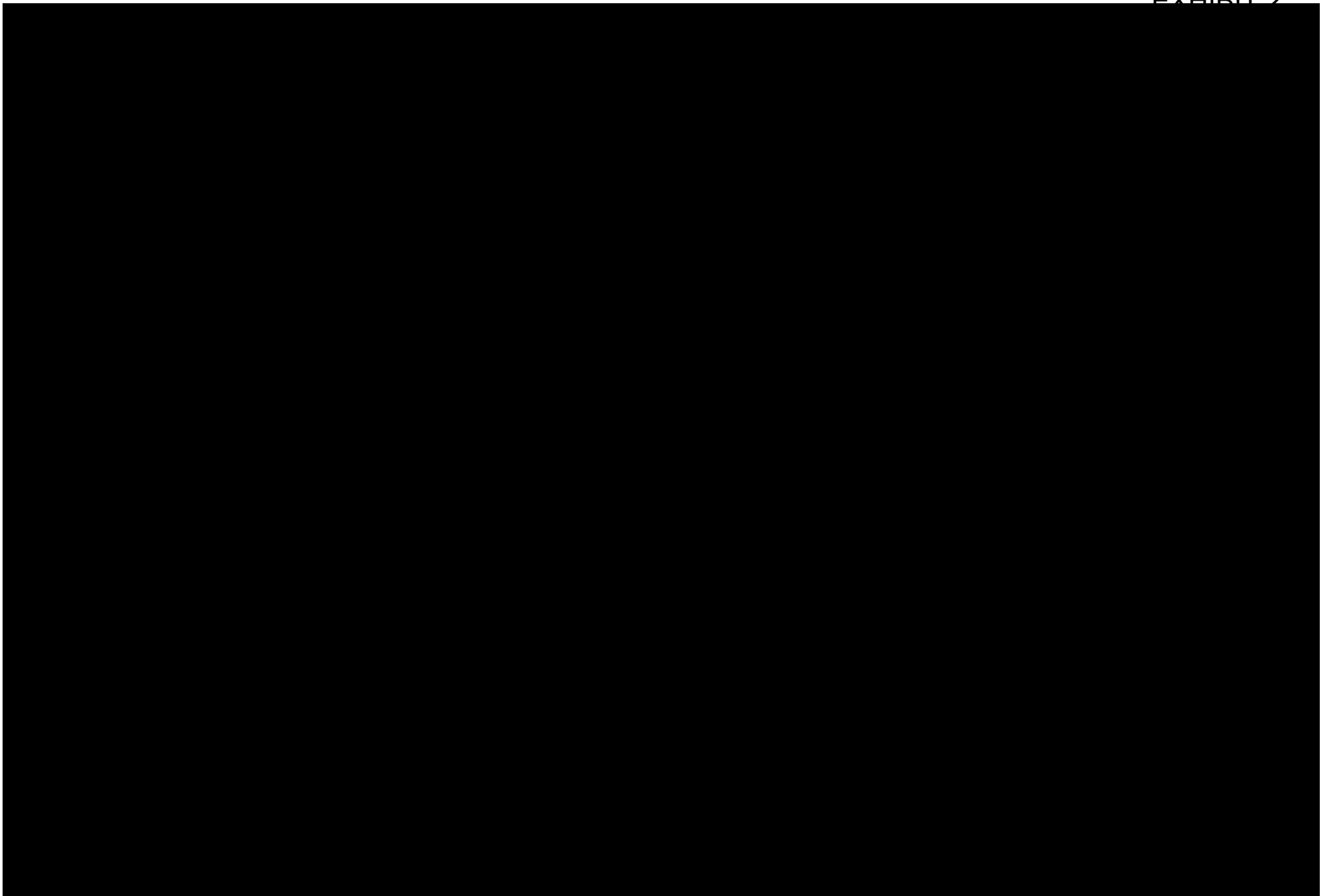


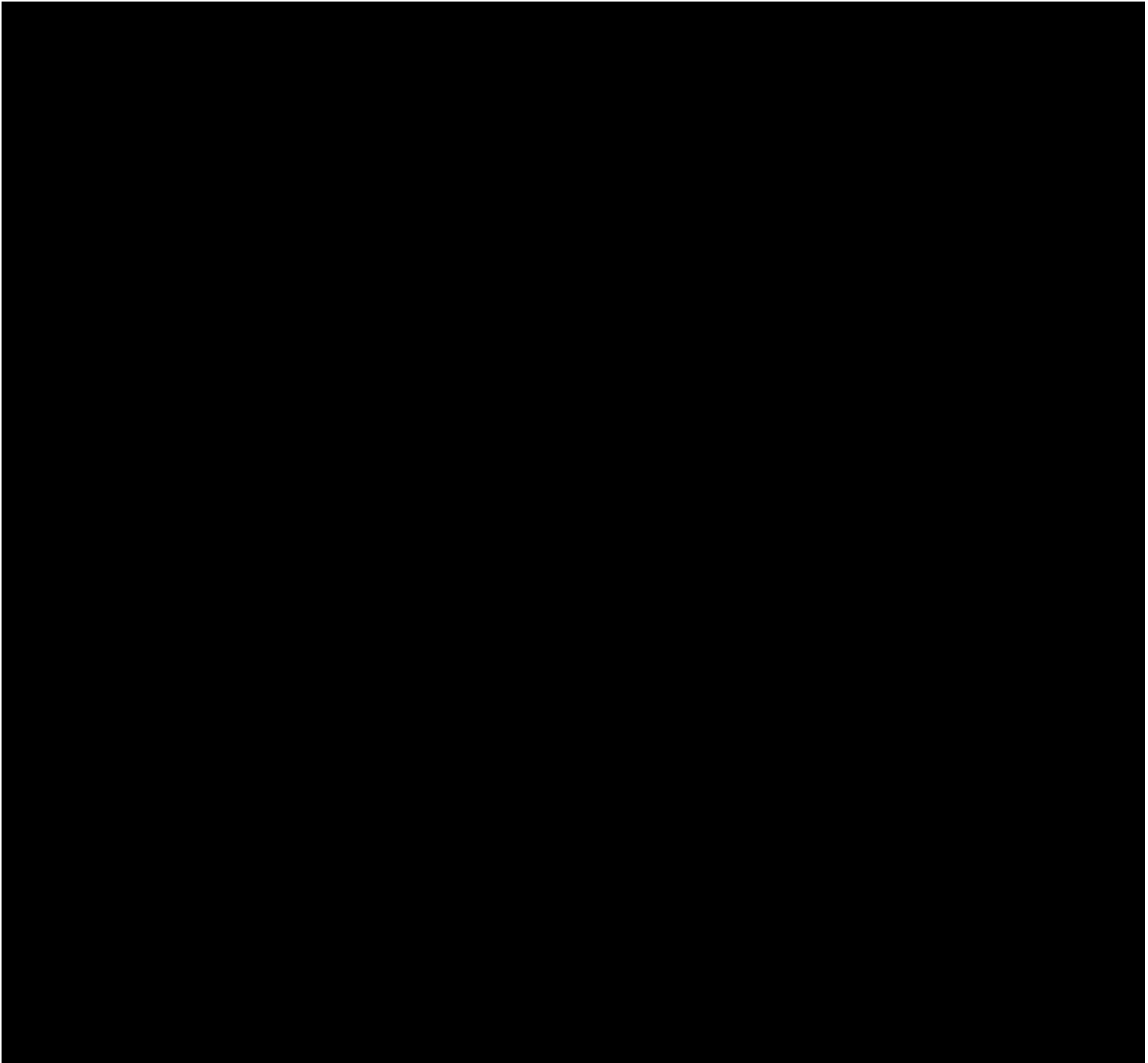


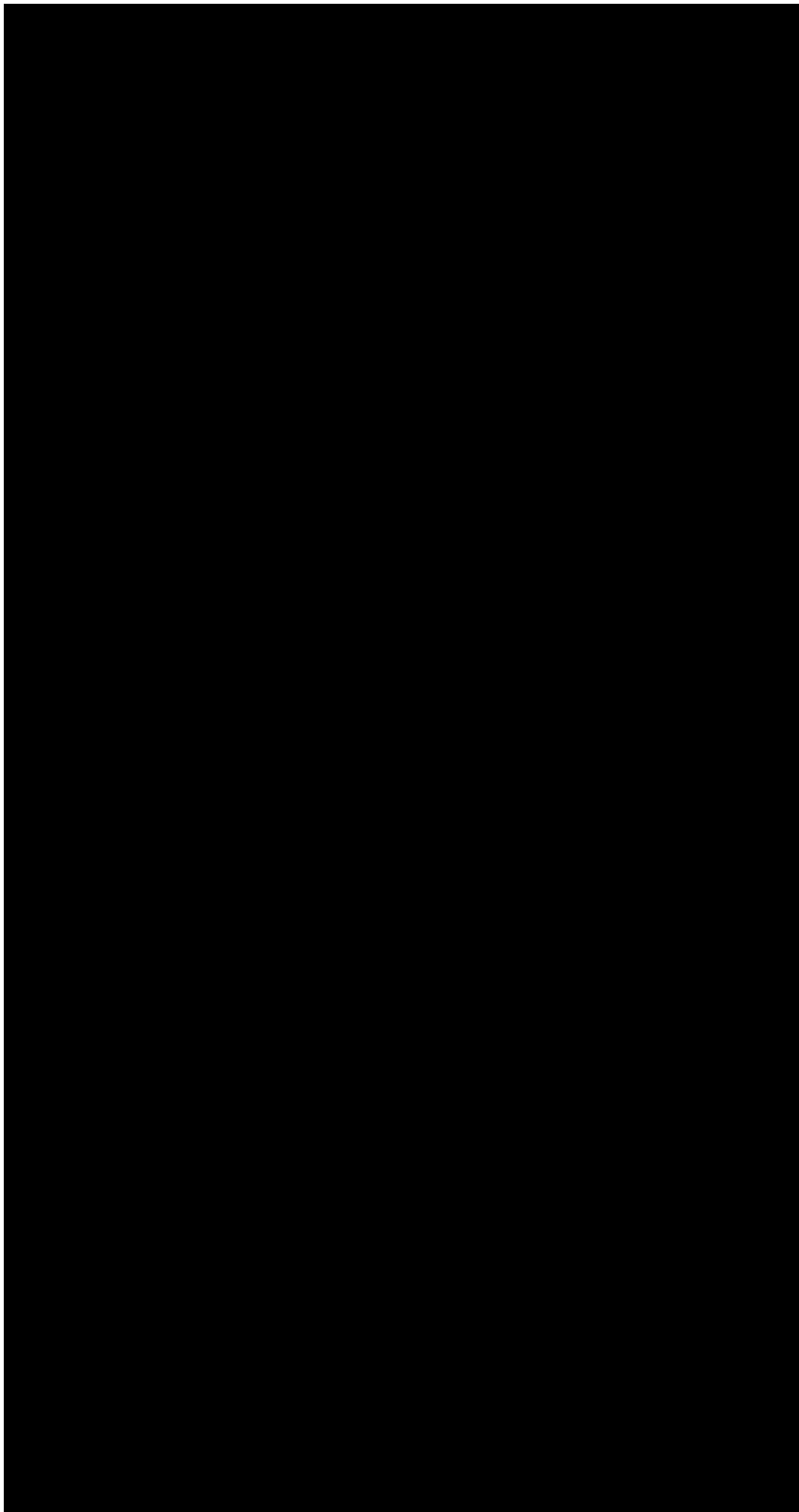


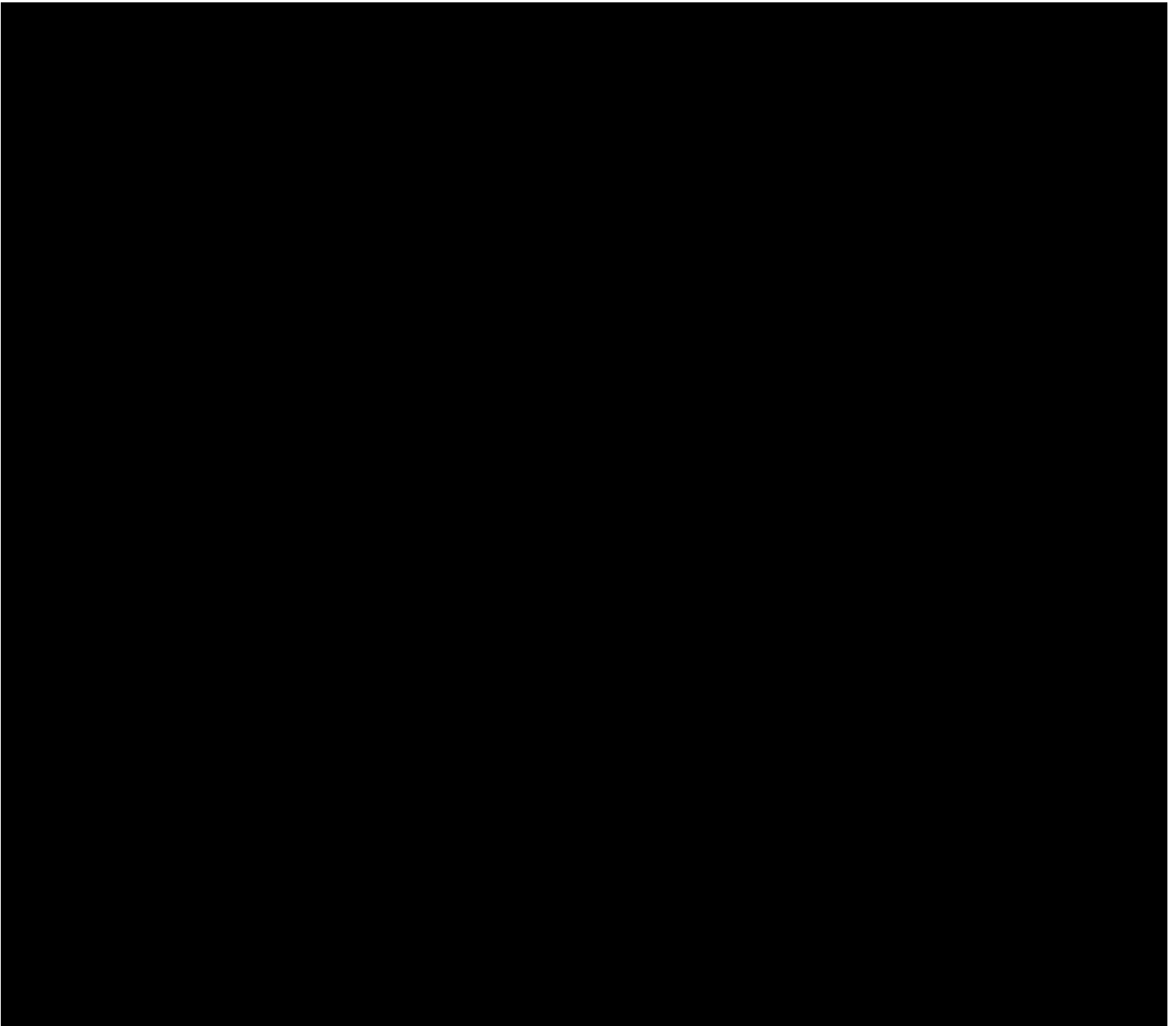


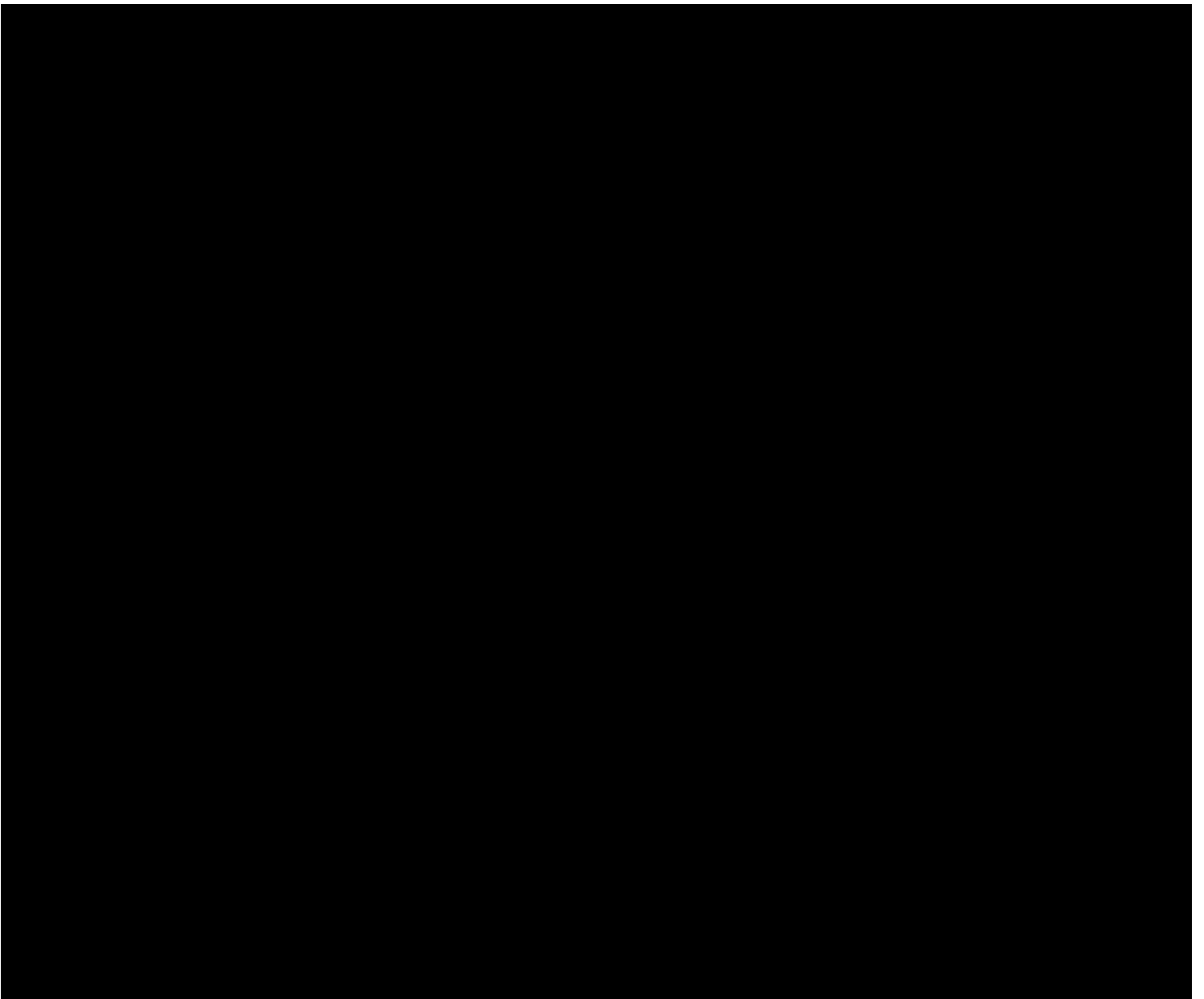


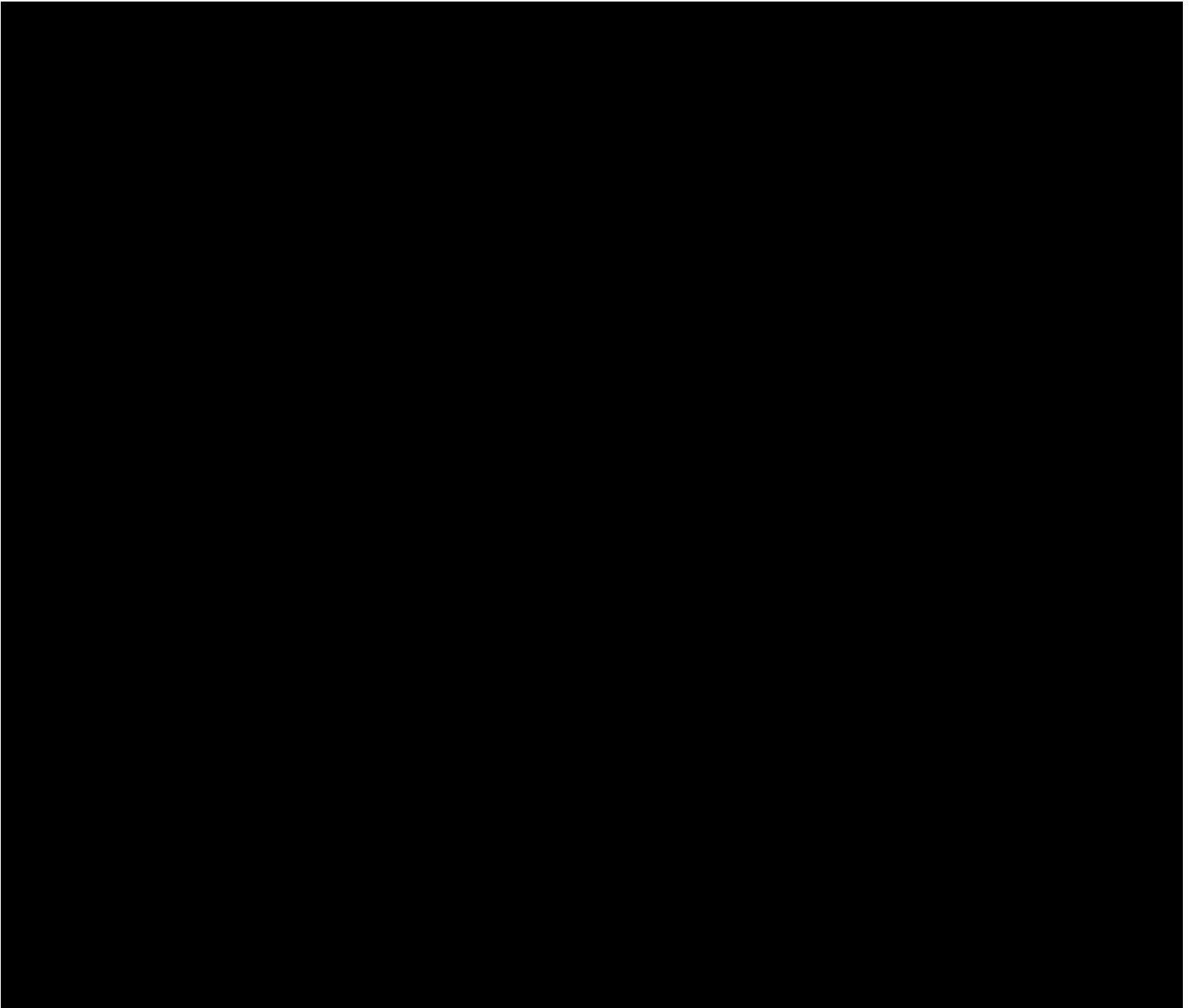


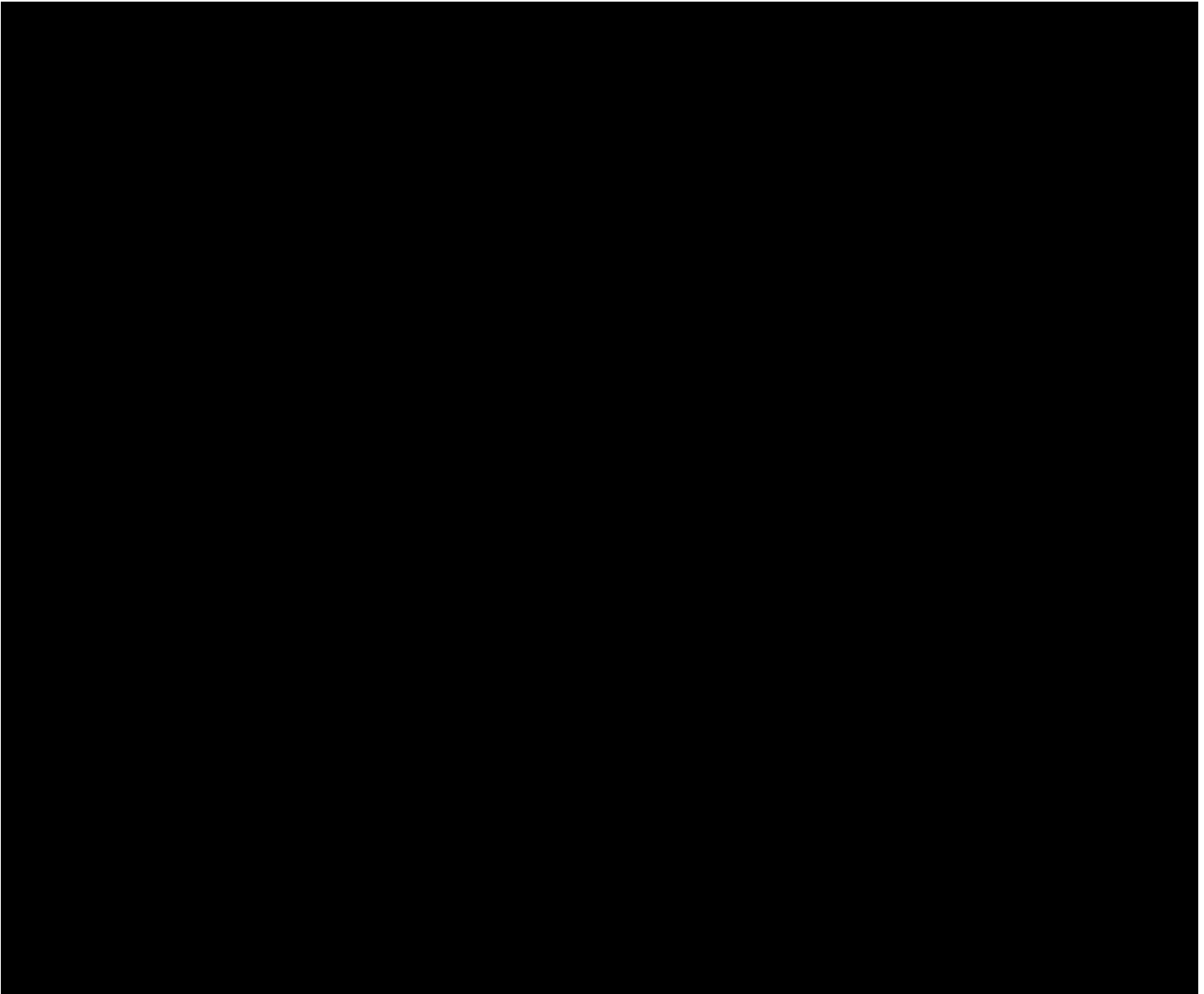










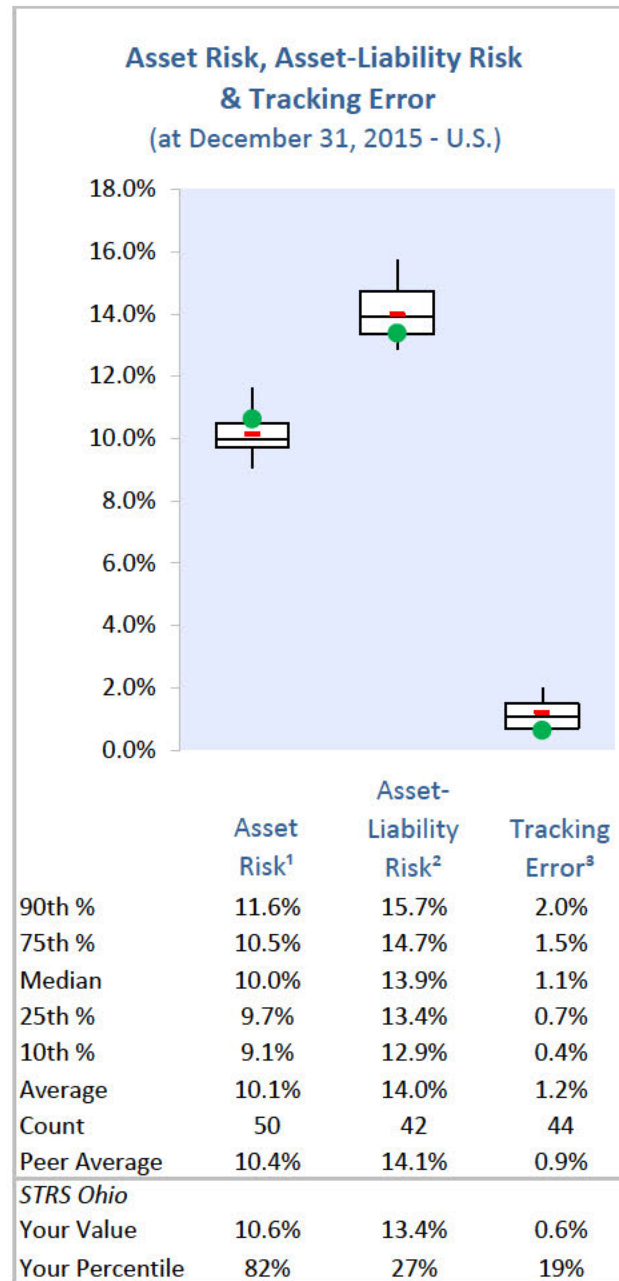


7

Risk

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Comparison of your risk levels to the U.S. Public universe



1 Asset risk is the expected volatility of your policy return. It is based on the historical variance of, and covariance between, the asset classes in your asset mix policy. It is expressed as an annual standard deviation.

2 Asset-liability risk is the expected volatility of surplus returns. Surplus returns are the changes in a plan's marked-to-market funded status caused by market factors. Asset liability risk is a function of the volatility of policy returns (asset risk), the volatility of surplus returns (surplus risk) and the correlation between policy returns and surplus returns.

3 Tracking error is the risk of active management. It equals the standard deviation of your annual net value added over 5-years.

Calculation of asset risk

Before considering the benefit of diversification, the weighted average risk of the asset classes in your asset mix policy was 14.0%.

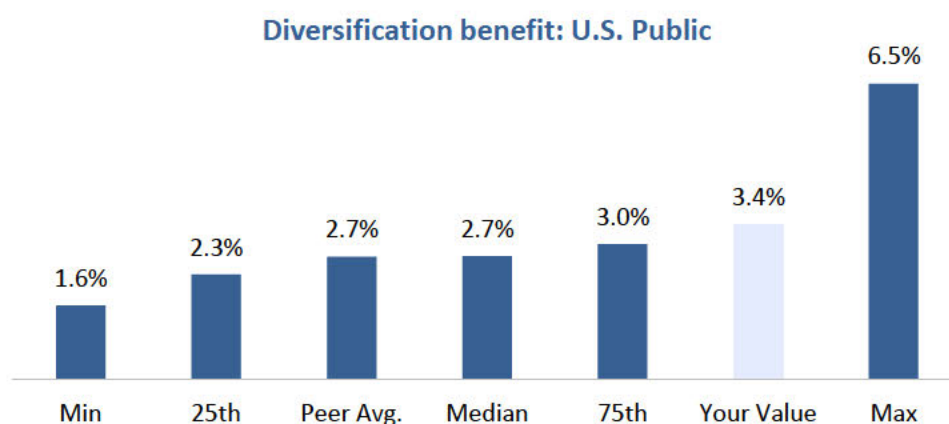
Calculation of your weighted asset class risk

Asset Class	Policy weight	Risk ¹	Weighted risk
	(A)	(B)	(A X B)
Stock: U.S. Large Cap	31.0%	14%	4.3%
Stock: EAFE (Currency Hedged)	10.4%	12%	1.2%
Stock: EAFE	10.4%	17%	1.7%
Stock: Emerging	5.2%	22%	1.2%
Bonds: U.S.	18.0%	6%	1.0%
Bonds: Cash	1.0%	1%	0.0%
REITs	1.5%	21%	0.3%
Real Estate	8.5%	12%	1.1%
Private Equity: LBO	14.0%	23%	3.3%
Weighted Total			14.0%

¹ Risk is the standard deviation of returns for the asset class based on standard benchmarks used by CEM. See page 15 of this section for benchmark details.

Reduction in asset risk due to diversification

Your asset risk is less than your weighted asset risk because of the benefit of diversification. Diversification reduces risk because when one asset class has a negative return, it might be offset by another asset class with a positive return. The lower the correlation between your policy asset classes, the greater the diversification benefit. The correlation between your policy asset classes is shown on page 17 of this section.



The benefit of diversification equals weighted asset risk minus asset risk.

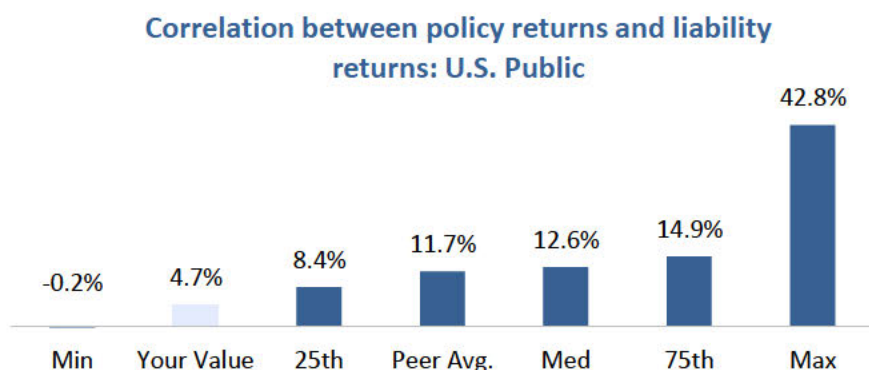
Components of asset risk

	You	Peer median*	Peer average	U.S. Public median*	U.S. Public average
Weighted asset risk	14.0%	12.9%	13.2%	12.8%	12.9%
Benefit of diversification	3.4%	2.8%	2.7%	2.7%	2.7%
Asset risk	10.6%	10.1%	10.4%	10.0%	10.1%

* Comparisons of components of asset risk should be interpreted with caution because it is not always possible to separate the diversification benefit from the weighted asset risk. For example, global stock as an asset class includes the diversification benefit of its geographic components within its asset risk.

Asset-liability risk

Your plan would not have any asset-liability risk if your assets perfectly matched your liabilities. If they matched, then the correlation between asset returns and liability returns would be 100%. If liabilities increased, assets would increase by a like amount (and vice versa). Thus higher correlation between your asset returns and liability returns reduces your asset-liability risk.



In addition to the correlation between asset returns and liability returns, asset-liability risk is also a function of the volatility of asset returns (asset risk) and the volatility of liability returns¹ (liability

$$\text{risk} = \sqrt{R_A^2 + R_L^2 - 2\rho_{AL}R_AR_L}.$$

Components of asset-liability risk

	You	Peer median	Peer average	U.S. Public median	U.S. Public average
Asset risk (R_A)	10.6%	10.1%	10.4%	10.0%	10.1%
Liability risk (R_L)	8.7%	11.1%	10.6%	11.2%	11.0%
Correlation between policy returns and liability returns (ρ_{AL})	4.7%	12.1%	11.7%	12.6%	13.5%
Asset-liability risk	13.4%	13.9%	14.1%	13.9%	14.0%

1. Liability returns equal the changes in your marked-to-market liabilities caused by market factors. These are assumed to equal the return on your liability proxy portfolio (see next page).

Liability proxy portfolio

Your liability proxy portfolio is the portfolio of nominal and inflation-indexed bonds that best matches the sensitivity of your liabilities to changes in real and nominal interest rates.

Comparisons of liability proxy portfolio

	Your fund		Peer average		U.S. Public	
	Duration	% of Assets	Duration	% of Assets	Duration	% of Assets
Inflation Indexed Bonds	10.0	22%	11.6	59%	12.5	64%
Nominal Bonds	10.8	79%	13.2	41%	13.5	36%
Total		100%		100%		100%

Your liability proxy portfolio is a tool that:

- Helps you understand how the unsmoothed market value of your liabilities responds to changes in real and nominal interest rates.
- Helps you make better asset mix policy decisions by providing an understanding of which assets will decrease your asset-liability risk (i.e., assets that behave similarly to the neutral asset mix) and which assets will increase your risk.
- Helps you understand how your liabilities are different from your peers. Differences in liabilities mean that the same asset will have different risk / reward characteristics for different funds. For example, the risk of a nominal bond for a fund with 100% inflation sensitivity is much higher than it is for a fund with less than 100% inflation sensitivity.

Asset-liability risk could theoretically be eliminated if your actual asset mix matched the liability proxy portfolio. However, we recognize that this is neither an option nor a goal for most funds because:

- The supply of inflation-indexed assets is limited. These assets are required to match the obligations of pension liabilities.
- This low-risk strategy also has a lower expected return, implying either higher future funding costs or lower future benefits.

The methodology and formula used to determine your liability proxy portfolio are provided on pages 11-13 of this section.

Liability risk

Differences in liability risk are due to differences in inflation sensitivity and member demographics.

A plan's inflation sensitivity depends on:

a) The type of plan

Final and highest average plans have more inflation sensitivity than career average plans. Conversely, career average plans have more inflation sensitivity than flat benefit plans. Your plan type is final average.

Plan type	# of plans	% of Total
Flat Benefit	1	2%
Career Average	-	0%
Final/Highest/Best Avg	48	91%
Other	4	8%
Total	53	100%

b) Contractual inflation protection for retired members

Your retired members get 0% contractual inflation protection. Your retiree inflation protection is subject to a cap of 2% per year, varies with retirement date.

Retiree inflation protection	# of plans		
	Corporate	Public	Other
0%	118	23	6
>0% and <50%	3	2	0
50%	0	2	0
>50% and <100%	2	7	0
100%	98	53	2
Total	221	87	8

c) Member demographics

Member demographics impacts both inflation sensitivity and the duration of plan liabilities. The survey asks for your plan's percentage of liabilities that relate to retired members from your actuarial reports. If you did not provide this number, then it is estimated (see page 12 of this section). Your percentage of liabilities that relate to retired members was 75%.

Membership Breakdown			
	Your fund	Peer Average	U.S. Average
Active Members	55%	57%	57%
Retired Members	45%	43%	43%
Total	100%	100%	100%

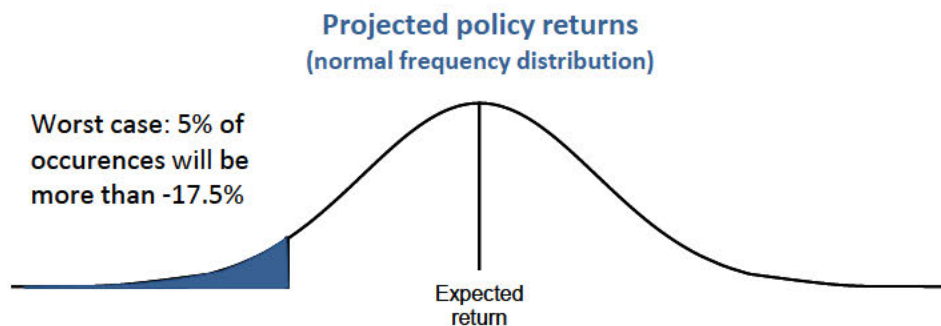
Projected worst case scenarios

We can convert your asset risk and asset-liability risk into worst case outcomes for policy returns and funded status if we make the following simplifying assumptions:

- a) Returns are normally distributed.
- b) Historic return volatility and correlations will continue in the future.
- c) No change in your policy asset mix or liabilities.

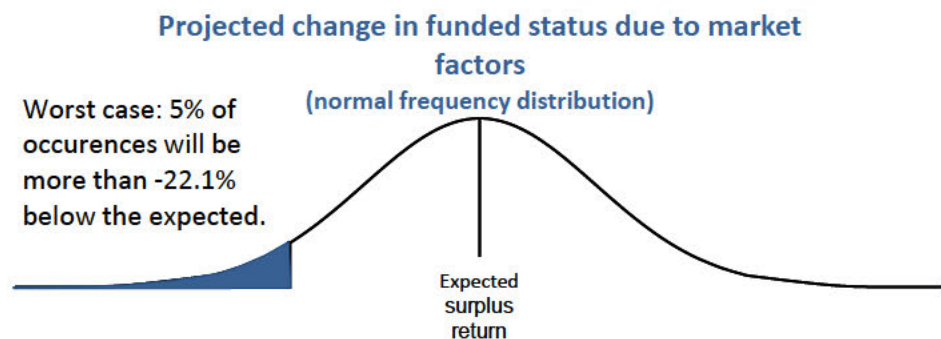
a) Worst case policy returns

Every year there is a 5% probability that your policy return will be worse than your expected policy return by more than -17.5% (-17.5% equals $-1.65 \times$ your asset risk of 10.6%). -17.5% is the starting point of worst case outcomes. They could be much worse.



b) Worst case impact on funded status

Every year, there is a 5% probability that changes in your mark-to-market funded status caused by market factors ("Surplus Returns") will be worse than expected by more than -22.1%. (-22.1% equals $-1.65 \times$ your asset-liability risk of 13.4%). -22.1% is the starting point of worst case outcomes. They could be much worse.



Historic worst case scenarios during the past 5 years

a) Historic worst case policy returns

During the past 5 years, your lowest policy return was 0.8% in 2011.

Historic policy returns - U.S.

	2015	2014	2013	2012	2011
90th %	1.6%	8.4%	18.2%	13.8%	3.7%
75th %	1.1%	7.4%	17.1%	13.2%	2.7%
Median	0.1%	6.5%	15.6%	12.6%	1.2%
25th %	-0.7%	5.6%	13.6%	11.9%	0.4%
10th %	-1.5%	4.8%	11.6%	11.0%	-0.3%
Average	0.1%	6.5%	15.1%	12.5%	1.5%
Count	55	63	62	66	67
Peer Avg	0.6%	7.0%	15.5%	12.6%	1.6%
Your Value	1.7%	8.3%	18.1%	13.9%	0.8%

b) Historic worst case changes in funded status

During the past 5 years, your worst change in marked-to-market funded status caused by market factors ("Surplus Returns") was -18.9% in 2011.

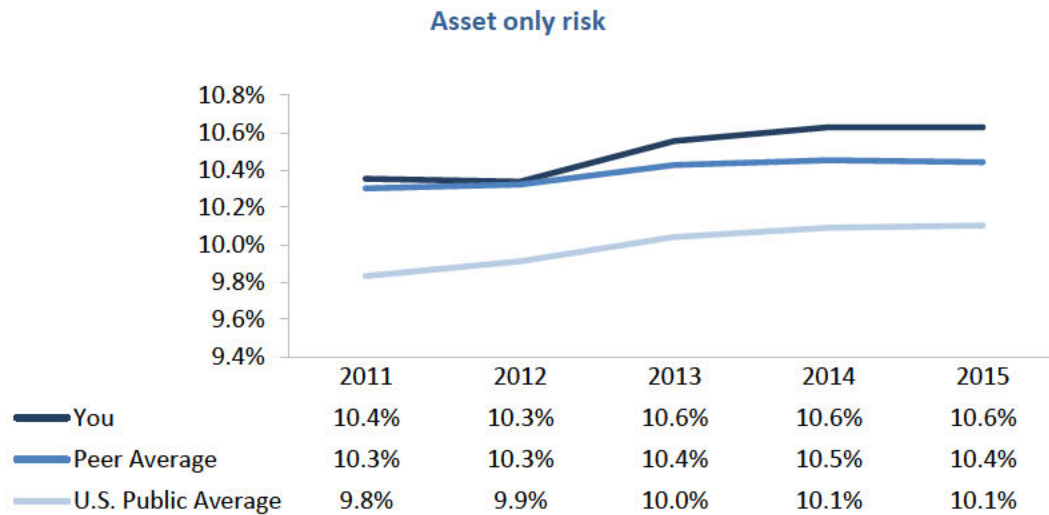
Historic changes in funded status caused by market factors - U.S.

	2015	2014	2013	2012	2011
90th %	4.9%	-4.9%	36.8%	10.5%	-17.2%
75th %	3.6%	-6.1%	33.5%	9.7%	-18.7%
Median	2.5%	-7.6%	31.1%	7.7%	-20.1%
25th %	1.0%	-9.5%	27.4%	5.8%	-21.3%
10th %	0.0%	-11.2%	25.7%	5.0%	-23.2%
Average	2.3%	-7.9%	30.8%	7.8%	-20.1%
Count	47	53	52	58	55
Peer Avg	2.6%	-7.4%	29.8%	7.9%	-19.6%
Your Value	1.7%	-6.1%	25.8%	10.2%	-18.9%

Risk Trends - 2011 to 2015

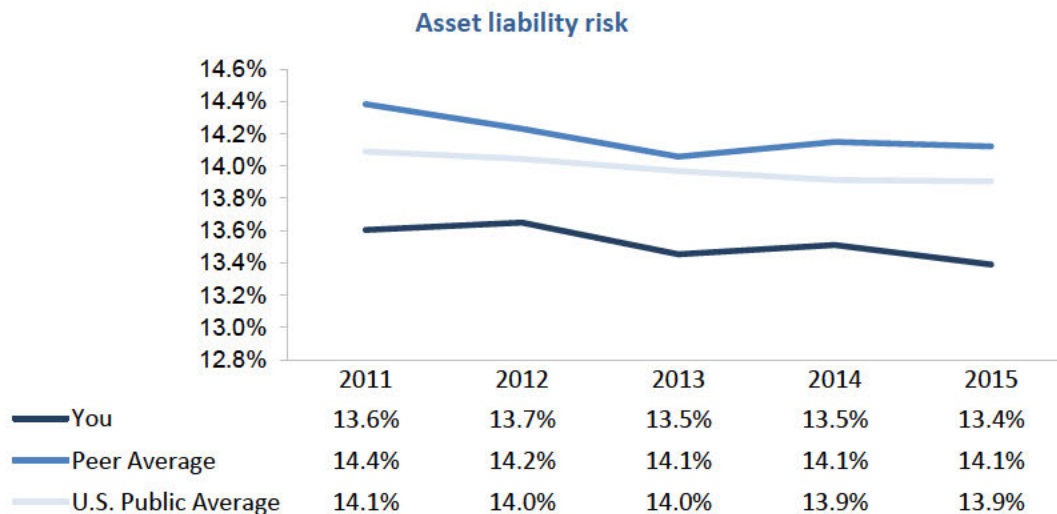
a) Asset risk trends

Asset risk will only change if policy asset mix changes. Between 2011 and 2015 the asset risk for your fund increased from 10.4% to 10.6%.



b) Asset-liability risk trends

Asset-liability risk will change if policy asset mix changes, or if the nature of your liabilities changes. Between 2011 and 2015 the asset-liability risk for your fund decreased from 13.6% to 13.4%.



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Appendix B - Methodology used to calculate asset and asset-liability risk

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Common asset class benchmarks used in United States

CEM uses the same asset class proxy benchmarks for all participants in calculating risk. Common benchmarks used for asset classes in your universe are shown below, along with the annualized standard deviation of monthly returns. Different asset classes have different histories - the start date after which monthly data was used for the given asset class is also shown.

Asset Class	Proxy Benchmark	Start Date	Standard deviation of monthly return - annualized (σ)
Stock: U.S. Broad/All	Russell 3000	Jan 1979	15.0%
Stock: U.S. Large Cap	S&P 500	Feb 1988	13.9%
Stock: U.S. Small Cap	Russell 2000	Jan 1979	19.0%
Stock: EAFE (Currency Hedged)	MSCI EAFE Hedged Exposure to Euro + Japan in (\$US)	Jan 1971	11.9%
Stock: EAFE	MSCI EAFE	Jan 1970	16.5%
Stock: Emerging	MSCI Emerging	Jan 1988	22.1%
Stock: Global	MSCI ACWI	Jan 1988	14.4%
Stock: ACWI x U.S.	MSCI ACWI ex US	Jan 1988	14.1%
Bonds: U.S.	Barclays US Aggregate	Feb 1976	5.6%
Bonds: High Yield	Barclays High Yield	Apr 1990	8.6%
Bonds: Long Bonds	Barclays U.S. Aggregate Long Government/Credit	Feb 1973	9.3%
Bonds: Cash	BofA ML U.S. T-BILL 3M	Feb 1978	0.5%
REITs	MSCI US REIT	Feb 1997	20.7%
Real Estate	CEM U.S. Real Estate Index Deleveraged	Jan 1983	12.4%
Hedge Fund	HFRI Fund Weighted Hedge Fund	Jan 1990	6.3%
Private Equity: Diversified or All	S&P Listed Private Equity	Dec 2003	23.2%
Liability: Real Return Bond Duration 10	Real Bond Duration 10	Aug 1984	9.4%
Liability: Real Return Bond Duration 11	Real Bond Duration 11	May 1985	10.3%
Liability: Nominal Bond Duration 10	Nominal Bond Duration 10	Dec 1985	9.2%
Liability: Nominal Bond Duration 14	Nominal US Bond Duration 14	Feb 1988	12.3%

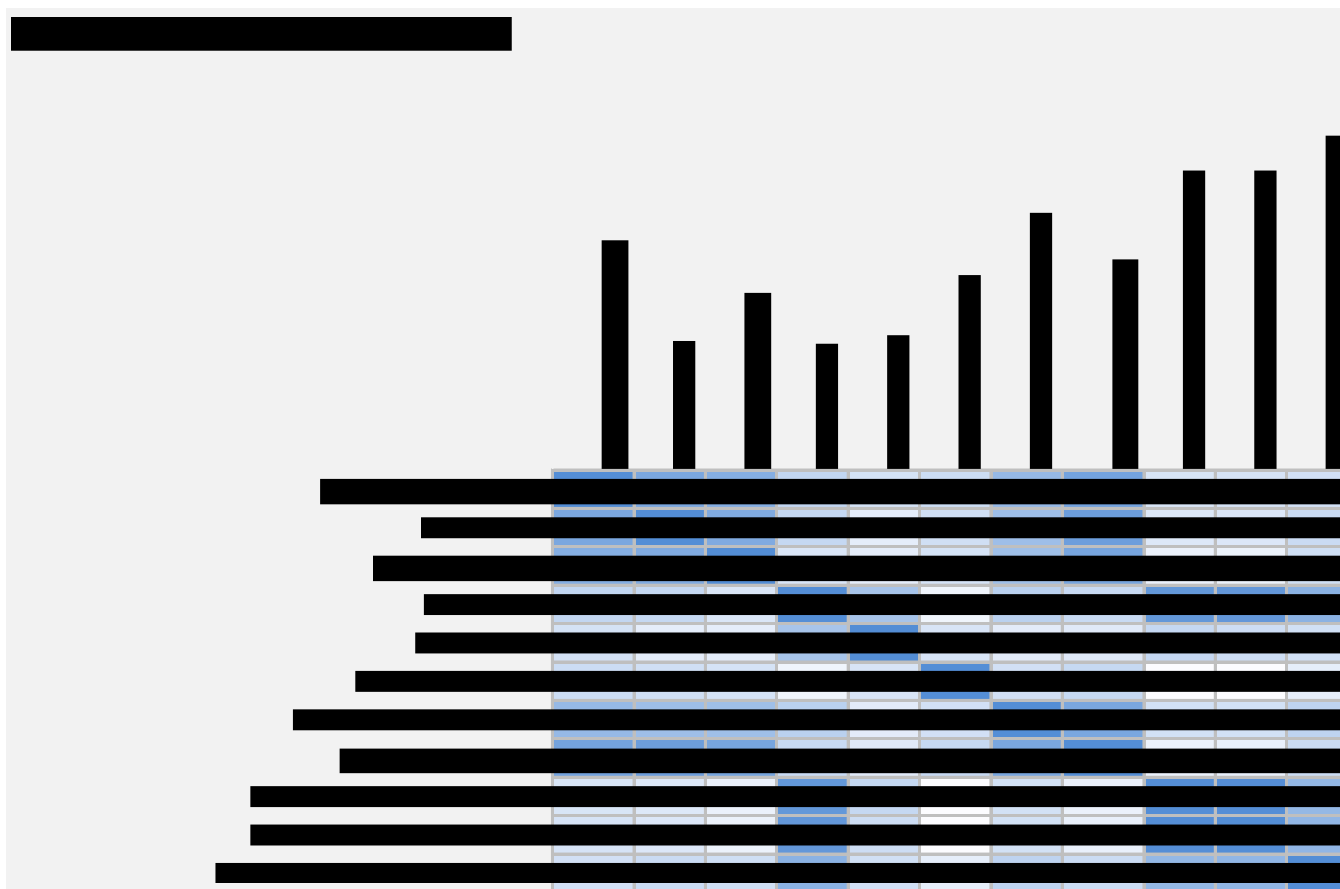
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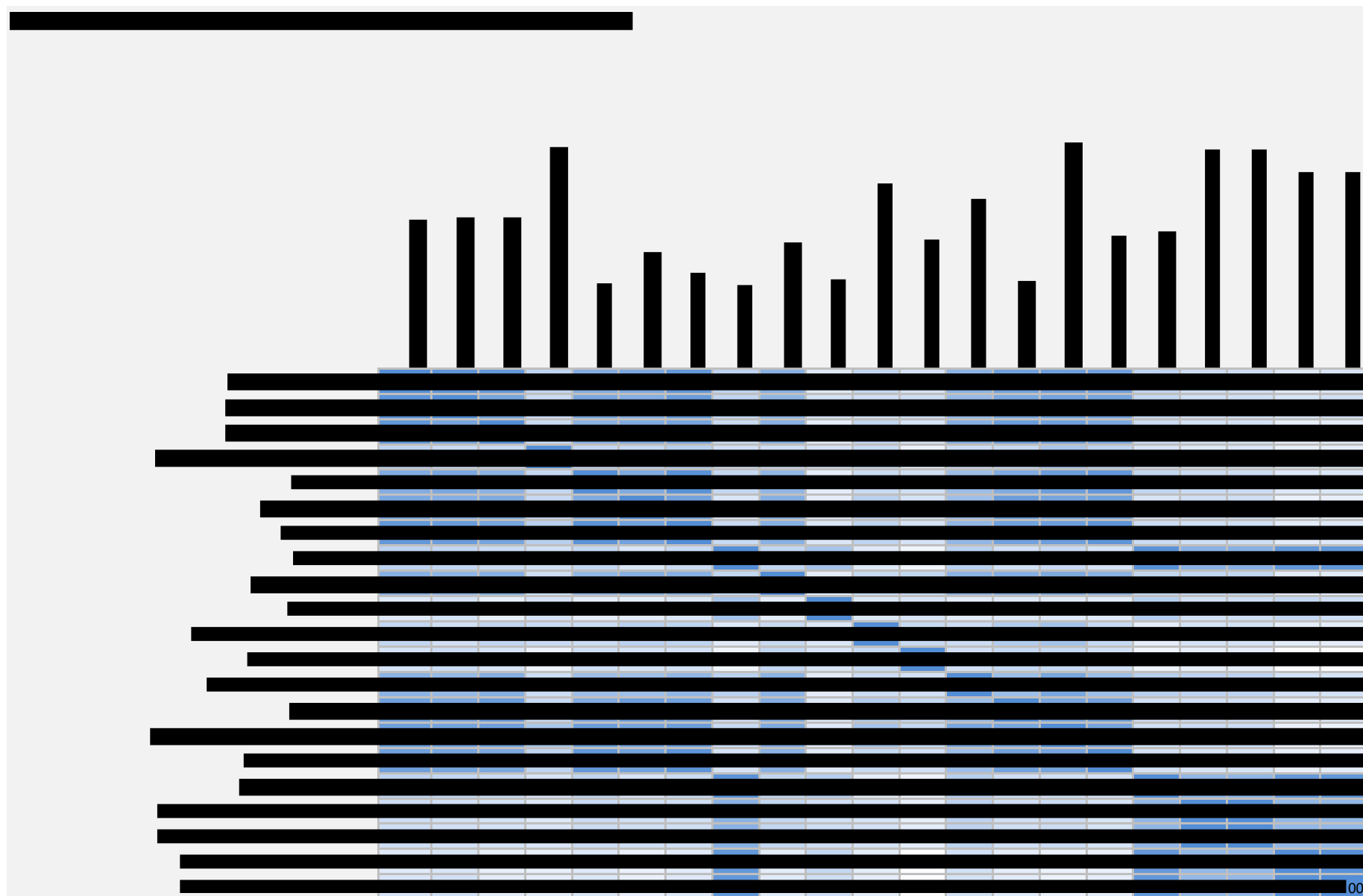
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Real Estate is proxied by the MSCI US REIT deleveraged by adding back in a return to debtholders of the Barclays CMBS Inv. Grade Commercial index. Average debt/total assets of REIT index before deleveraging is estimated to be 40%.





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Appendices

Appendix A - Data Summary

Appendix A2 - Enhanced survey data & mapping to regular survey

Appendix B - Data quality

Appendix C - Glossary of terms

Appendix A - Data Summary

STRS Ohio

Plan Info	2015	2014	2013
Contact	Lynn Hoover	Lynn Hoover	John Morrow
Type of fund (corporate, public, other)	Public	Public	Public
Total fund size (mils) as at December 31	70,756.0	73,655.0	72,345.0
Asset-class level holdings provided on survey are: year end or average?	Year End	Year End	Year End
Total return for year ended	2.47%	7.95%	17.39%
Is the return net or gross?	Gross except for	Net of a	Net of a
If net, what do you normally deduct?	private asset costs	specified amount	specified amount
		131,800	126,626
Total fund policy or benchmark return	1.71%	8.26%	18.09%

Ancillary Data	2015	2014	2013
What is your hedging policy for:			
Foreign Holdings	50%	50%	50%
What were your actuarial fees in 000s?	247	244	227
How many plan members/beneficiaries do you have:			
Active?	189,731	194,451	194,173
Active (no-accrual)?	135,215	134,844	136,105
Retired?	158,116	152,208	149,221
Other?	17,453	17,036	17,081
What type of plan(s) do you have?	Final Average	Final Average	Final Average
To what extent are your retired members' benefits indexed to inflation?			
Contractual %			
Ad hoc %			
If the indexation is subject to a cap, describe the cap	2% per year, var	2% per year, var	2% per year, vari
What % of the plan's liabilities pertain to retired members?	75	72	72
Actuarial valuation assumptions for funding purposes:			
Liability discount rate	7.8	7.8	7.8
Salary progression rate	3.5	3.5	3.5
What was your actuarial assumption for expected rate of return?	7.8	7.8	7.8

Appendix A - Data Summary: Policy Weights and Benchmarks

STRS Ohio

Asset Class		Policy Weight	Benchmark	
			Description	Return
U.S. Stock - Large Cap	2015	31.0	Russell 1000 (Russell 3000 for total Dom Equity)	0.5
	2014	31.0	Russell 1000 (Russell 3000 for total Dom Equity)	12.6
	2013	33.0	Russell 1000 (Russell 3000 for total Dom Equity)	33.6
U.S. Stock - Small Cap	2015		Russell 2000	-4.4
	2014		Russell 2000	4.9
	2013		Russell 2000	38.8
Stock - EAFE	2015	20.8	MSCI World xUS 50% Hedged Net	0.4
	2014	20.8	MSCI World xUS 50% Hedged Net	0.8
	2013	20.0	MSCI World xUS 50% Hedged	23.1
Stock - Emerging	2015	5.2	MSCI Emerging Market net	-14.9
	2014	5.2	MSCI Emerging Market Net	-2.2
	2013	5.0	MSCI Emerging Market gross	-2.3
Stock - ACWIxU.S.	2015		International Blended Benchmark	-2.8
	2014		International Blended Benchmark	0.2
	2013		International Blended Benchmark	17.6
Stock - Global	2015		MSCI ACWI net	-2.4
	2014		MSCI ACWI Net	4.2
	2013		MSCI ACWI	22.8
Fixed Income - U.S.	2015	18.0	Barclays Universal for total FI (Barclays Aggregate Index not appropriate for US FI segment)	0.4
	2014	18.0	Barclays Universal for total FI (Barclays Aggregate Index not appropriate for US FI segment)	5.6
	2013	18.0	Barclays Universal for total FI (Barclays Aggregate Index not appropriate for US FI segment)	-1.3
Fixed Income - Emerging	2015		Barclays Emerging Market	1.3
	2014		Barclays Emerging Market	4.8
	2013		Barclays Emerging Market	-4.1
Fixed Income - High Yield	2015		Barclays US Corp High Yield	-4.5
	2014		Barclays US Corp High Yield	2.5
	2013		Barclays US Corp High Yield	7.4
Cash	2015	1.0	US 90 day T bill	0.1
	2014	1.0	US 90 day T bill	0.0
	2013	1.0	US 90 day T bill	0.1
Global TAA	2015		Custom (Alternative Investment Actual Return)	6.1
	2014			
	2013			
Hedge Funds	2015		Custom (Alternative Investment Actual Return)	6.1
	2014		Custom (Alternative Investment Actual Return)	13.5
	2013		Custom (Alternative Investment Actual Return)	16.5
REITs	2015	1.5	Your REIT benchmark	3.2
	2014	1.5	Your REIT benchmark	30.1
	2013	1.5	Your REIT benchmark	2.5
Infrastructure	2015		Custom (Alternative Investment Actual Return)	6.1
	2014		Custom (Alternative Investment Actual Return)	13.5
	2013		Custom (Alternative Investment Actual Return)	16.5
Real Estate ex-REITs	2015	8.5	NCREIF NPI	13.3
	2014	8.5	NCREIF NPI	11.8
	2013	8.5	NCREIF NPI	11.0
Natural Resources	2015		Custom (Alternative Investment Actual Return)	6.1
	2014		Custom (Alternative Investment Actual Return)	13.5
	2013		Custom (Alternative Investment Actual Return)	16.5
Diversified Private Equity	2015		Custom (Alternative Investment Actual Return)	6.1
	2014	14.0	Custom (Alternative Investment Actual Return)	13.5
	2013	13.0	Custom (Alternative Investment Actual Return)	16.5
LBO	2015	14.0	Custom (Alternative Investment Actual Return)	6.1
	2014			
	2013			
Venture Capital	2015		Custom (Alternative Investment Actual Return)	6.1
	2014		Custom (Alternative Investment Actual Return)	13.5
	2013		Custom (Alternative Investment Actual Return)	16.5
Other Private Equity	2015		Custom (Alternative Investment Actual Return)	6.1
	2014		Custom (Alternative Investment Actual Return)	13.5
	2013		Custom (Alternative Investment Actual Return)	16.5

Appendix A - Data Summary: Public Market Assets, Returns and Costs

STRS Ohio

Asset Class		Assets (millions) and Annual Gross Returns							Investment Fees / Costs in 000s							
		Internally Managed				Externally Managed			Internally Managed				Externally Managed			
		Indexed		Active		Active		# of mgrs	Indexed		Active		Active			
		Assets	Return	Assets	Return	Assets	Return		000s	bps ¹	000s	bps ¹	Base Fees ³	Perform Fees	Internal & Other ³	Total 000s
U.S. Stock - Large Cap	2015	8,672.3	2.4	10,308.3	-0.1	1,003.0	2.5	1	40.6	0.0	11,892.8	11.0	2,168.3		143.1	2,311.4
	2014	8,757.0	13.3	11,364.0	11.7	981.0	13.1	1	38.5	0.0	10,519.9	9.4	2,055.0		356.5	2,411.5
	2013	8,746.0	32.4	10,979.0	30.1	870.0	33.4	1	37.6	0.0	10,919.0	9.4	1,925.0		57.2	1,982.2
U.S. Stock - Small Cap	2015			778.8	-2.4	1,101.3	-1.2	6			293.3	3.6	8,895.4		141.4	9,036.9
	2014			844.0	6.5	1,140.0	3.8	6			155.0	2.1	9,386.0		116.8	9,502.8
	2013			636.0	41.5	1,389.0	43.1	7			147.6	2.1	9,563.0		116.0	9,679.0
Stock - EAFE	2015			5,658.2	1.8	5,529.7	5.6	3			2,833.8	5.0	19,934.8		253.7	20,188.4
	2014			5,578.0	1.0	5,816.0	1.6	3			2,480.6	4.4	19,588.0		302.5	19,890.5
	2013			5,783.0	22.5	5,561.0	29.3	4			2,325.3	3.7	17,949.0		26.4	17,975.4
Stock - Emerging	2015			1,856.3	-10.5	920.4	-13.7	3			2,594.9	14.2	5,317.9		263.8	5,581.7
	2014			1,810.0	-2.4	1,073.0	0.4	3			1,951.2	11.1	6,245.0		584.2	6,829.2
	2013			1,703.0	-2.1	1,056.0	0.7	3			2,308.4	12.6	7,237.0		143.2	7,380.2
Stock - ACWIxU.S.	2015			2,730.5	-1.8	1,206.1	2.0	2			433.2	1.6	5,022.1		24.2	5,046.3
	2014			2,775.0	0.5	990.0	n/a	2			418.7	1.5	1,993.0		4.2	1,997.2
	2013			2,840.0	n/a						408.6	2.9				
Stock - Global	2015			778.8	-1.2						457.4	5.8				
	2014			788.0	3.7						422.9	5.5				
	2013			761.0	24.6						408.6	6.0				
Fixed Income - U.S.	2015			9,726.0	1.0						2,413.4	2.3				
	2014			11,082.0	5.5						2,649.7	2.2				
	2013			12,492.0	-1.5						2,702.2	2.4				
Fixed Income - Emerging	2015					731.4	1.1	2					3,586.6		170.3	3,756.9
	2014					864.0	2.0	2					3,742.0		51.1	3,793.1
	2013					721.0	-4.4	2					2,871.0		44.3	2,915.3
Fixed Income - High Yield	2015					953.9	-4.0	2					4,427.6		277.5	4,705.1
	2014					1,229.0	2.5	2					4,185.0		102.6	4,287.6
	2013					871.0	8.6	2					3,346.0		59.3	3,405.3
Cash	2015			1,274.8	0.1						268.6	1.4				
	2014			2,480.0	0.1						265.9	0.9				
	2013			3,446.0	0.1						256.4	0.8				
Global TAA	2015					383.8	-2.2	1					678.1		27.6	705.6
	2014															
	2013															
REITs	2015	1,166.2	3.2													
	2014	1,098.0	30.5						16.5	0.3						
	2013			959.0	1.9						328.4	3.4				
Hedge Funds	2015					2,039.1	-0.6	11					35,310.0	9,973.0	300.3	45,583.2
	2014					2,050.0	3.3	11					32,279.0	22,798.0	263.3	55,340.3
	2013					1,566.0	11.4						23,293.0		52.4	23,345.4

1. Cost in basis points = total cost / average of beginning and end of year holdings

Appendix A - Data Summary: Private Market Assets, Returns and Costs

STRS Ohio

Asset Class		Assets (millions) and Annual Returns									Investment Fees / Costs in 000s¹														
		Internal & Co-Inv		External		Fund of Funds				# Ext Mgrs	Internal & Co-Inv		External					Fund of Funds							
						Amt fees	Assets		Return				Amt fees	Assets		Return	Base	Perform	Internal	Total¹	bps (% of	Underlying²	Base	Perform	Internal
		Assets	Return	based on			Return	based on			Return	Fees	Fees	& Other	000s	fee basis)	Fees	Fees	& Other	000s	fee basis)				
Infrastructure	2015					83.6	105.5		5.6	1															
	2014					100.0	100.0		17.7	1															
	2013					100.0	80.0		4.2																
Real Estate ex-REITs	2015	5,554.9	13.0							37	16,561.4	30.9													
	2014	5,177.0	14.8							18	14,191.5	28.7													
	2013	4,696.0	12.0							27	12,476.3	26.6													
											Under	Oversight													
	2015					1,599.0	1,008.5	11.0																	
	2014					1,401.0	1,009.0	18.0																	
	2013					1,670.0	1,044.0	10.5																	
Natural Resources																									
	2015	455.9	3.0							10	109.7	2.5													
	2014									6															
	2013																								
	2015					544.8	478.1	3.0																	
	2014					491.0	351.0	9.2																	
Diversified Private Equity	2015					75.3	60.3	9.9		7															
	2014					6,288.0	2,893.0	18.9	1,123.0	527.0	18.9														
	2013					5,784.0	2,865.0	20.0	1,048.0	478.0	20.0														
LBO	2015					3,337.4	2,550.5	9.9	808.1	661.8	9.9														
	2014																								
	2013																								
Venture Capital	2015					1,205.5	919.9	11.9	270.0	205.5	11.9														
	2014					1,761.0	880.0	17.9	170.0	132.0	17.9														
	2013					1,756.0	820.0	10.5	170.0	76.0	10.5														
Other Private Equity	2015	841.1	9.9			1,494.6	1,095.3	2.4		32	118.0	8.1	19,370.8	867.1	20,237.9	110.0									
	2014	1,145.0	13.5			2,185.0	722.0	13.5			142.9	1.3	10,511.0	456.7	10,967.7	58.3									
	2013	1,062.0	16.5			1,580.0	521.0	16.5			91.3	1.1	9,422.0	248.6	9,670.6	67.8									

1. Cost in basis points = total cost / average of beginning and end of year holdings. Total cost excludes private asset performance fees because of comparability issues.

2. Default for fees paid to underlying partnerships have been applied.

Appendix A - Data Summary: Oversight, Custodial and Other Costs

STRS Ohio

Oversight, Custodial and Other Costs			
		000s	bps
Oversight of the fund assets ¹	2015	4,539.4	0.6bp
	2014	3,804.1	0.5bp
	2013	4,072.6	0.6bp
Custodial total	2015	2,149.9	0.3bp
	2014	1,673.0	0.2bp
	2013	1,438.0	0.2bp
Custodial foreign (if available)	2015		
	2014		
	2013		
Custodial domestic (if available)	2015		
	2014		
	2013		
Consulting / performance measurement	2015		
	2014		
	2013		
Audit	2015	158.3	0.0bp
	2014	136.0	0.0bp
	2013	119.0	0.0bp
Other (legal etc)	2015	374.8	0.1bp
	2014	339.0	0.0bp
	2013	327.0	0.0bp
Total	2015	7,222.4	1.0bp
	2014	5,952.1	0.8bp
	2013	5,956.6	0.9bp

Summary of All Asset Management Costs			
		000s	bps
Investment Management Costs	2015	266,898.0	37.0bp
	2014	235,459.6	32.3bp
	2013	204,276.6	29.6bp
Overlay Costs	2015	457.4	0.1bp
	2014	175.2	0.0bp
	2013	100.0	0.0bp
Oversight, Custodial & Other Costs	2015	7,222.4	1.0bp
	2014	5,952.1	0.8bp
	2013	5,956.6	0.9bp
Total	2015	274,577.8	38.0bp
	2014	241,587.0	33.1bp
	2013	210,333.2	30.5bp

1. Oversight includes the salaries and benefits of executives and their staff responsible for overseeing the entire fund or multiple asset classes and the fees / salaries of the board or investment committee. All costs associated with the above including fees / salaries, travel, director's insurance and attributed overhead should be included.

Appendix A - Data Summary: Overlays

STRS Ohio

Overlays																
		Notional amount (mils)	Market value (mils)	Profit/ Loss (000s)	Cost (000s)	% of Notion. (bps)	Duration (years)	Notional amount (mils)	Market value (mils)	Profit/ Loss (000s)	Base fees (000s)	Perf. fees (000s)	Over- sight (000s)	Total (000s)	% of Notion. (bps)	Duration (years)
	2015	4,664.4			111.5	0.2		4,357.9					345.9	345.9	0.8	
	2014	3,800.0			69.5	0.2		4,786.0					105.7	105.7	0.2	
	2013	4,371.0			81.5	0.2		3,936.0					18.5	18.5	0.0	

Appendix A - Data Summary - Enhanced Survey Data and Mapping to Regular Survey - Mapped Data

Data after the mapping process from enhanced survey to regular is shown below. The below data is used through the rest of this report.

Investment Costs by Asset Class and Style (\$000s)									
	Internal		External Passive		External Active			Total	
	Passive	Active	Fees	Monitoring & Other	Base Fees	Perform. Fees	Monitoring & Other	000s	% of Total
U.S. Stock - Large Cap	41	11,893			2,168		143	14,245	5%
U.S. Stock - Small Cap		293			8,895		141	9,330	3%
Stock - EAFE		2,834			19,935		254	23,022	8%
Stock - Emerging		2,595			5,318		264	8,177	3%
Stock - ACWIxU.S.		433			5,022		24	5,480	2%
Stock - Global		457						457	0%
Fixed Income - U.S.		2,413						2,413	1%
Fixed Income - Emerging					3,587		170	3,757	1%
Fixed Income - High Yield					4,428		277	4,705	2%
Cash		269						269	0%
Infrastructure - Fund of Funds					501		40	541	0%
Infrastructure - Fund of Funds					1,946			1,946	1%
Real Estate ex-REITs		16,561						16,561	6%
Real Estate ex-REITs - LPs					17,938		444	18,382	7%
Natural Resources		110						110	0%
Natural Resources - LPs					7,660		102	7,761	3%
Hedge Funds					35,310	9,973	300	35,610	13%
Global TAA					678	0	28	706	0%
Diversified Private Equity					1,430		11	1,441	1%
LBO					42,752		330	43,082	16%
LBO - Fund of Funds					5,966		218	6,184	2%
LBO - Fund of Funds					11,206			11,206	4%
Venture Capital					15,585		354	15,939	6%
Venture Capital - Fund of Funds					1,562		19	1,581	1%
Venture Capital - Fund of Funds					3,665			3,665	1%
Other Private Equity		118			19,371		867	20,356	7%
Overlay Programs		112			0		346	457	0%
Total investment management costs - Internal & Monitoring								42,461	15%
Total investment management fees (excluding performance in private assets)								214,921	78%
Total investment management costs								37.0bp	267,355 97%

Oversight, Custodial & Other Asset Related Costs (\$000s)				
Oversight of the Fund			4,539	2%
Trustee & Custodial			2,150	1%
Audit			158	0%
Other			375	0%
Total oversight, custodial & other costs			1.0bp	7,222 3%

Total cost for STRS Ohio	38.0bp	274,578	100%
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*Default cost used. Refer to Appendix A.

Costs in blue come from the following page.

Costs in purple are from a two-step process shown over the next two pages.

Appendix A - Data Summary - Enhanced Survey Mapping to Regular Survey

Activity	Cost per Enhanced Survey	# of FTE	Step 1: Attribution of Oper. & Support	Cost with Attribution
Front Office				
internal fixed income	2,148	6.0	713	2,861
Internal liquidity reserves	150	1.0	119	269
internal reit	0	0.0	0	0
internal real estate	11,687	41.0	4,875	16,561
internal real estate indirect	325	1.0	119	444
internal alternative investments	109	1.0	119	228
internal passive domestic equity	29	0.1	12	41
internal active large & mid cap	8,622	29.9	3,555	12,177
internal active small cap quant	115	1.5	178	293
internal developed	2,285	6.8	803	3,087
internal emerging	2,116	6.3	743	2,859
internal global quant	339	1.0	119	457
external alternative investments	1,674	5.0	594	2,269
internal Global ex US (ACWI ex US)	339	1.0	119	457
Currency hedge (from internal developed)	339	1.0	119	457
Total front office	30,274	102.5	12,186	42,461
Governance, Operations and Support				
Board, CEO & assistants re: investments (A)	1,081	2.0	238	1,319
CIO, Investment strategy, asset allocation (B)	2,389	7.0	832	3,221
Oversight of the fund per regular CEM survey (A + B)				4,539
Custodial fees	2,150	n/a	n/a	2,150
Internal Audit	158	1.0	n/a	158
Legal services	375	1.0	n/a	375
Risk management	144	0.5	-144	0
Responsible investing, corporate governance			0	0
Performance reporting and data management	1,996	3.0	-1,996	0
Investment operations and "investment finance"	717	5.0	-717	0
Project planning and management			0	0
Compliance	154	1.0	-154	0
Information Technology	6,700	38.0	-6,700	0
Public relations and internal communication	268	2.0	-268	0
Finance, external reporting & tax	473	3.0	-473	0
Human resources	401	2.0	-401	0
Building, utilities and office services	2,310	16.0	-2,310	0
Non-specific allocated overhead	93	8.0	-93	0
Total cost excluding external manager fees	49,683	192.0	0	49,683

How CEM mapped the above costs to the regular survey

CEM attributed both front office and back office costs to the CEM asset classes by style using the following methodology:

Step 1 - CEM attributed operations and support costs to front office & oversight pro rata based on FTE.

Step 2 - CEM attributes the fully loaded cost (shown in green) to all of the CEM asset classes that the team manages (see next page). The attribution preserves the relative cost ratios versus the CEM universe for each of the asset classes that the team manages.

Appendix A - Data Summary - Enhanced Survey Mapping of Internal Teams

Front Office	Cost with Attribution from Step 1	Responsibilities by CEM asset class	Step 2 Attribution to Asset Classes
internal fixed income	2,861	Fixed Income - U.S.	2,413
		Monitoring Fixed Income - Emerging	170
		Monitoring Fixed Income - High Yield	277
Internal liquidity reserves	269	Cash	269
internal reit	0	Passive REITs	0
internal real estate	16,561	Real Estate ex-REITs	16,561
internal real estate indirect	444	Monitoring LP Real Estate ex-REITs	444
internal alternative investments	228	Other Private Equity	118
		Natural Resources	110
		Other Private Equity	0
internal passive domestic equity	41	Passive U.S. Stock - Large Cap	41
internal active large & mid cap	12,177	U.S. Stock - Large Cap	11,893
		Monitoring U.S. Stock - Large Cap	143
		Monitoring U.S. Stock - Small Cap	141
internal active small cap quant	293	U.S. Stock - Small Cap	293
internal developed	3,087	Stock - EAFE	2,834
		Monitoring Stock - EAFE	254
internal emerging	2,859	Stock - Emerging	2,595
		Monitoring Stock - Emerging	264
internal global quant	457	Stock - Global	457
external alternative investments	2,269	Monitoring Infrastructure - Fund of Funds	40
		Monitoring LP Natural Resources	102
		Monitoring Hedge Funds	300
		Monitoring Diversified Private Equity	11
		Monitoring Venture Capital - Fund of Funds	19
		Monitoring Venture Capital	354
		Monitoring Other Private Equity	867
		Monitoring Global TAA	28
		Monitoring LBO - Fund of Funds	218
		Monitoring LBO	330
internal Global ex US (ACWI ex US)	457	Stock - ACWIxU.S.	433
		Monitoring Stock - ACWIxU.S.	24
Currency hedge (from internal developed)	457	Passive Derivatives/Overlays - Currency	112
		Monitoring Passive Derivatives/Overlays - Currency	346
Total Front Office	42,461		42,461

Front Office team costs, including allocated operations and support costs (see prior page), are attributed to the asset classes managed or overseen by the team. These attributions, shown in purple, are then inserted back into the regular survey.

Appendix A - Data Summary - Enhanced Survey Definitions

Costs - Attribute 100% of costs excluding manager fees and transaction costs including:

- (i) **Salaries and benefits** of FTE
- (ii) **General & administrative**: travel, supplies, staff education, publications and reference materials, etc.
- (iii) **Consulting** and other third party fees

FTE - Includes full time permanent salaried employees, include the FTE of long and short term contract individuals dedicated to your organization that are working onsite or working full-time for your fund on a project or in a role supervised by your staff. Do not include FTE at external consultants or service providers if they are not being supervised by your staff, even if they are dedicated to serving your organization.

Activity Definitions

1. Front Office consists of investment-decision making staff, including traders, analysts, portfolio managers and staff selecting and monitoring external managers, their immediate assistants and their management below the CIO level. Include third party fees for advice at the asset-class or security level such as manager search consultants, private equity consultants, and investment specific legal and due diligence fees that are not treated as transaction costs.

Do NOT include:

- (i) External manager fees. These are collected separately on the holdings tabs.
- (ii) Costs that relate to activities defined as Governance, Operations and Support in the table such as: board consultants, CIO, asset allocation and risk policy consultants, or other services (such as building, utilities and office services, information technology and human resources).

a. Board, CEO & assistants re: investments: Include only the proportion of the costs (fees paid to Board directors, travel, director insurance, CEO and CEO's direct assistants) equal to their proportion of time spent on investments and investment governance support. Exclude time spent on non-investment activities such as benefit administration, sales, marketing, new product development.

b. CIO, Investment strategy, asset allocation: Include 100% of CIO FTE and costs including his/her direct assistants, total fund asset allocation strategy, tactical deviations from the mix, economic political or other research, etc.

c. Risk management: Developing and implementing risk controls for operational and investment risk including surplus risk, factor exposures, credit, counterparty, etc. Excludes the cost of IT/IS risk systems. These belong in IT/IS.

d. Internal Audit: Independent review of business processes. Excludes external auditor fees. These belong in Finance, external reporting & tax

e. Responsible investing, corporate governance: Policy setting and coordination across asset classes for sustainable, socially and/or environmentally responsible investing, and for corporate governance.

f. Client account management: Client service & reporting related to investing client assets, including client Board meetings, strategic client advice (ALM, risk, client portfolio construction).

g. Custodial fees: should be reported gross before any reductions relating to securities lending or other revenues credited against fees.

h. Data, valuation & performance analytics: Valuation and performance measurement of securities, funds, portfolios, risk, compliance, client reporting and other analysis and reporting. Include costs of data, dealing with data vendors and cleaning data.

Appendix A - Data Summary - Enhanced Survey Definitions (page 2)

i. Investment operations: Listed security operations including trade settlement, custodial bank monitoring and reconciliation, cash management and corporate actions, private asset class, derivatives and swap administration, COO. If the COO or CFO is responsible for multiple activities (i.e., Valuations and performance analytics, investment operation and finance) then split their FTE between the activities based on time spent.

j. Compliance: Monitoring, training on and dealing with regulatory infractions. Includes securities and pension regulation. Excludes compliance related to benefit administration.

k. IT/IS systems: IT management and strategy, architecture, data center, database and application management and maintenance, development, user services, network, telecommunications, etc. Also include the costs of purchasing and maintaining the following systems/software applications: portfolio management, risk management, trade processing/order execution management, compliance monitoring, performance analytics, fund accounting system. Exclude the pro rata

l. Public relations and internal communication: External communication with entities such as regulators and media. Internal communication to staff. Excludes member and employer communication, marketing and sales.

m. Finance, external reporting & tax: Financial statements, external auditor fees, general accounting, budgeting, tax reporting, procurement and accounts payable. CFO. If the CFO or COO is responsible for multiple activities (i.e., finance and IT) then split their FTE between the activities based on time spent.

n. Legal services: General counsel, corporate secretary, legal counsel of any kind, even those specializing in real estate or private equity, paralegals, legal assistants and all FTE involved in legal analysis and advice. Investment related legal fees and costs, such as the legal fees to close private equity transactions, should be included under 'Front Office' if not treated as a transaction cost. Exclude amounts that pertain to non-investment activities such as benefit administration.

o. Human resources: Human resources staff and consulting, including recruitment, training, career development, induction, disciplinary action, developing HR policies and procedures, etc.
Exclude: Amounts that relate to non investment activities such as benefit administration and both severance and recruitment fees and activity specific training (these should be included in the Front Office Cost Centers table).

p. Building, utilities and office services: Building occupancy costs including rent, lease, amortization of leaseholds and depreciation of buildings, office services such as reception, mailroom, cleaning and maintenance, building insurance, utilities. Include satellite offices. Exclude the pro rata portion that relates to non-investment activities such as benefit administration, sales, marketing, new product development.

Appendix B - Data quality

The value of the information contained in these reports is only as good as the quality of the data received. CEM's procedures for checking and improving the data include the following.

Improved survey clarity

Twenty years of feedback from survey participants has led to improved definitions and survey clarity. In addition to immediate feedback from participants, CEM has hosted user workshops to solicit additional feedback and to resolve issues, such as trade-offs between more information and effort on the part of participants.

Computer and desktop verification

Survey responses are compared to norms for the survey universe and to each sponsor's prior year data when available. This typically results in questions generated by our online survey engine as well as additional follow-up to clarify responses or with additional questions.

In addition to these procedures, data quality continues to improve for the following reasons:

Learning curve -

This is CEM's 25th year of gathering this data and experience is teaching the firm and the participants how to do a better job.

Growing universe -

As our universe of respondents continues to increase in size, so does our confidence in the results as unbiased errors tend to average themselves out.

Any suggestions on how to further improve data quality are welcome.

Currency Conversions

For reports where either the peer group or report universe includes funds from multiple countries, we have converted the returns back to the base currency of the fund we prepared the report for. For example, for a Euro zone fund with peers from the U.S. we converted U.S. returns to Euro based on the currency return for the year using December 31 spot rates.

Appendix C - Glossary of terms

Average cost

- Calculated by dividing actual annual costs by the average of beginning and end-of-year holdings. If beginning-of-year holdings are not available, they are estimated using end-of-year holdings before the effect of this year's return on investment.

Benchmark return

- Rate of return on a portfolio of investable assets (such as the S&P500) designated as the benchmark portfolio against which the fund measures its own performance for that asset class.

F statistics

- Measure of the statistical significance of the regression coefficients taken as a group. Generally, regression equations with 5 coefficients and sample sizes greater than 20 are statistically significant if its F statistic is greater than 3.

Global TAA

- Fully funded segregated asset pool dedicated to active asset allocation.

Impact coefficient

- Estimate of the impact on the dependent variable in a regression of a change in the value of a given explanatory variable

Level of significance

- Degree to which sample data explains the universe from which they are extracted.

N-year peers

- Subset of peer group that have participated in our study for at least the consecutive n years.

Oversight of the fund

- Resources devoted to the oversight of the fund.

Overlay

- Derivative based program (unfunded other than margin requirements), designed to enhance total portfolio return (such as a tactical asset allocation program) or to achieve some specific mandate such as currency hedging.

Passive proportion

- Proportion of assets managed passively, i.e., indexed to broad capital market benchmarks or dedicated to replicate market benchmarks.

Policy mix

- Reflects long-term policy or target asset weights. Policy asset mix is often established by a fund's investment committee or board and is determined by such long term considerations as liability structure, risk tolerance and long term capital markets prospects.

Policy return

- The return you would have earned if you had passively implemented your policy mix decision through your benchmark portfolios. Your policy return equals the sum of your policy weights multiplied by your asset class benchmarks for each asset class.

R squared (coefficient of determination)

- The percentage of the differences in the dependent variable explained by the regression equation. For example, an R squared of 1 means 100% of the differences are explained and an R squared of 0 means that none of the differences are explained.

Value added

- the difference between your total actual return and your policy return. It is a measure of actual value produced over what could have been earned passively.