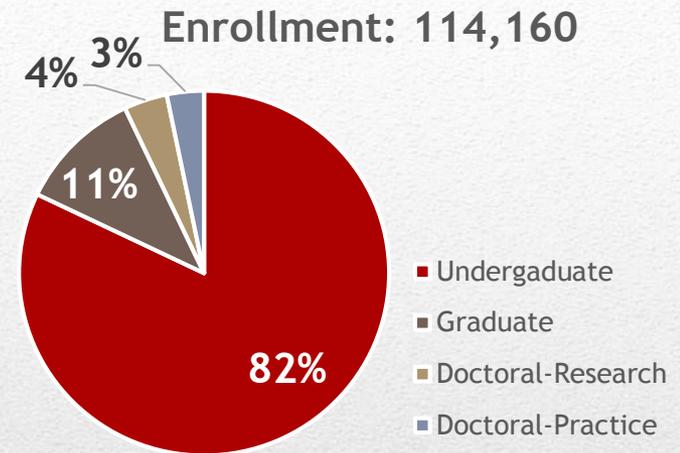


FISCAL OFFICER DEVELOPMENT SERIES OFFICE OF THE TREASURER INVESTMENTS

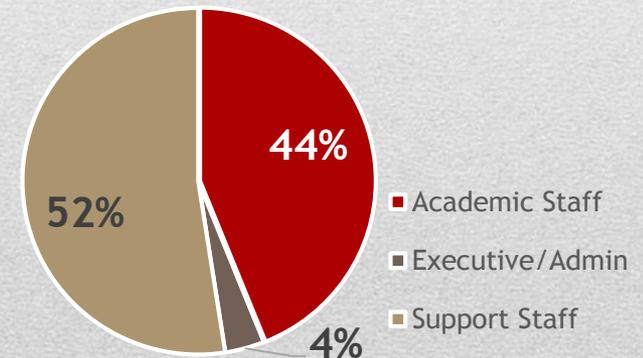
Alex Yuchvid
December 15, 2016

Fast Facts about Indiana University (Fall 2016)

- Founded in 1820
- Public university in the state of Indiana
- Seven campuses
- Total living alumni: more than 640,000
- Annual operating budget \$3.5 billion
- Research centers and institutes: more than 200
- Endowment: \$2 billion
- **Operating Funds: \$2 billion**
- Debt: \$1 billion
- Monthly payroll and benefits: \$162MM
- Credit rating Aaa by Moody's and AAA by S&P

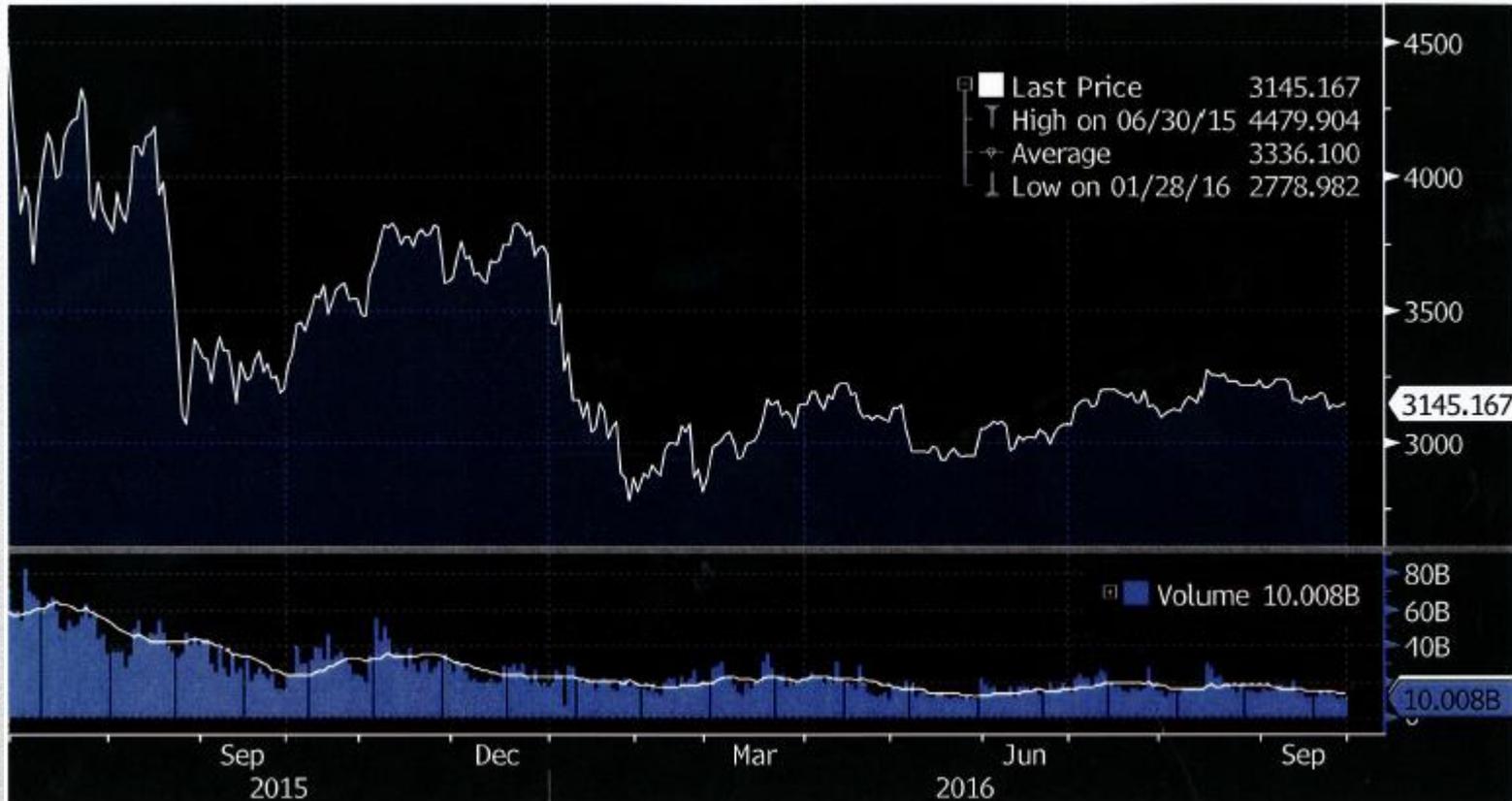


20,503 Employees



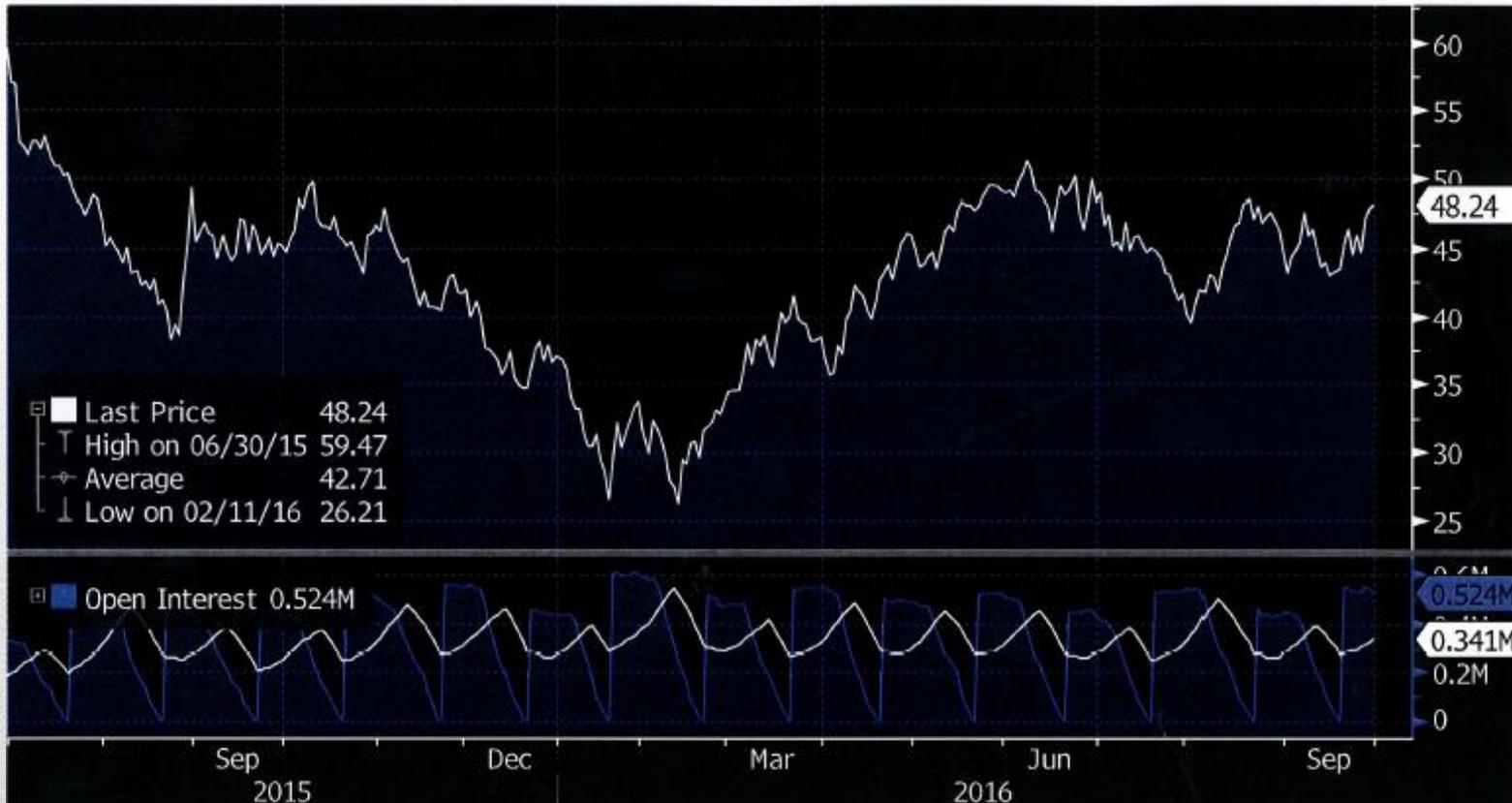
IU is a major multi-campus public research institution

Macroeconomic Trends



Shanghai Stock Exchange fell 38% from the high point on 6/30/2015 to low point on 1/28/2016

Macroeconomic Trends



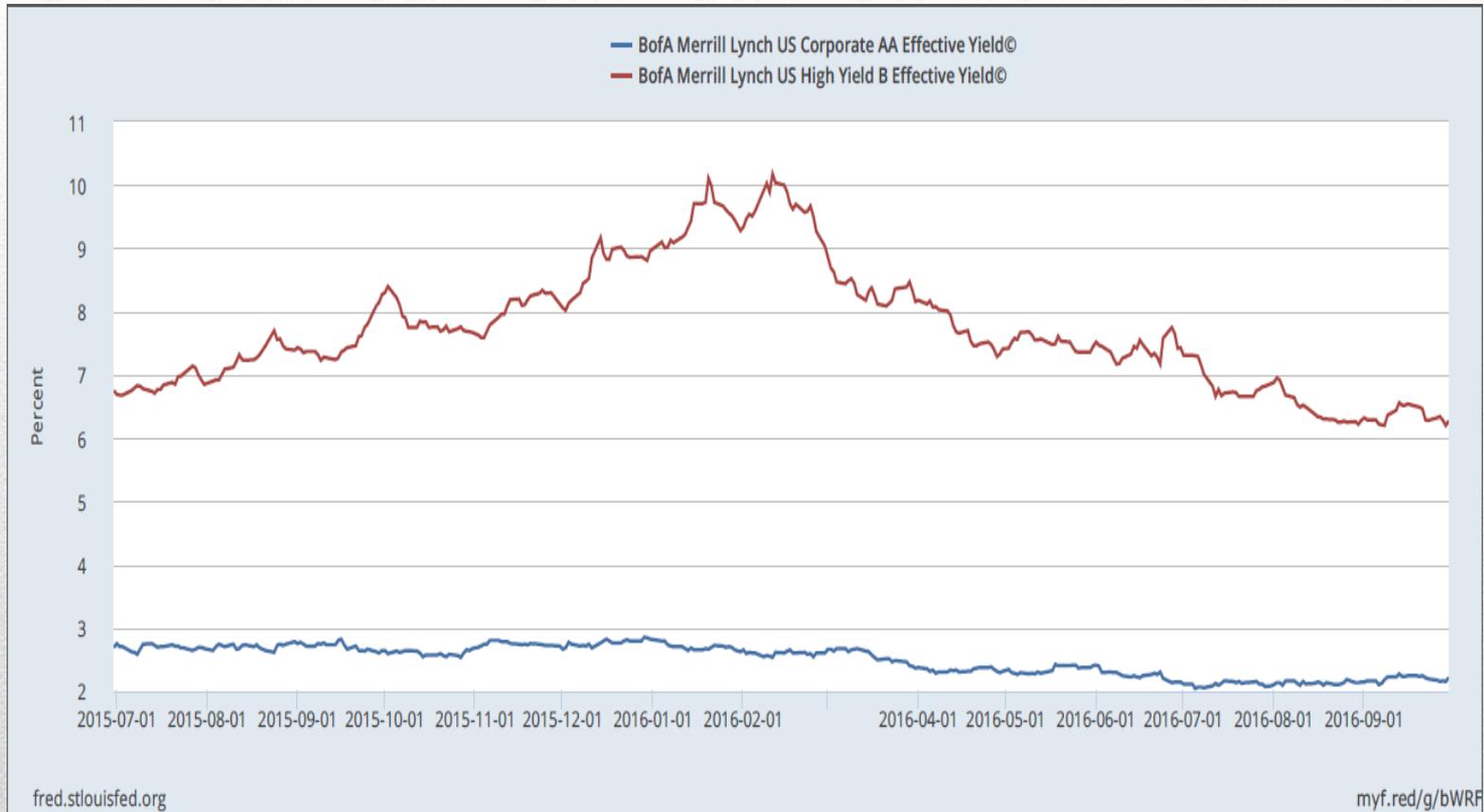
Oil price fell 56% from the high point on 6/30/2015 to low point on 2/11/2016; then it rose 84% to \$48.24 a barrel on 9/30/2016

Macroeconomic Trends



S&P 500 index fell 11% and then rose 19%

Macroeconomic Trends



High speculative US bonds experienced volatility; volatility of high grade US bonds was minimal

IU Investment Portfolio

IUOF Net Quarterly Investment Returns

Quarterly Net Returns	2015		March 31	2016	
	September 30	December 31		June 30	September 30
	0.0%	0.0%	0.2%	0.1%	0.1%
	-0.2%	0.1%	0.4%	0.4%	0.2%
	-0.1%	0.1%	0.5%	0.5%	0.4%
	0.4%	-0.2%	1.0%	0.9%	0.2%
	-0.2%	0.0%	0.7%	1.0%	0.6%
	0.4%	-0.4%	1.1%	0.8%	0.1%
	0.4%	-0.3%	1.0%	0.7%	0.1%
	0.1%	0.0%	2.5%	2.9%	1.7%
	-2.3%	-0.5%	3.7%	3.3%	2.1%
	0.8%	-1.3%	3.9%	2.6%	0.4%
	-2.0%	-0.6%	0.6%	2.0%	2.8%
	-3.4%	1.2%	0.0%	1.2%	2.0%
	-0.6%	-0.3%	3.3%	2.0%	0.9%
	-1.4%	0.1%	0.2%	1.5%	2.5%

The volatility of the IUOF was subdued

- Background
- Investment Strategy
- Recent Activity
- Where We Are Today
- Investment Policy



BACKGROUND INVESTMENT STRATEGY

IU Operating Funds - Background

Statutory Environment:

- Article XI, Section 12 of the Indiana Constitution precludes IU to invest in equity
- IU's available funds can only be invested in fixed income securities
- Indiana University has no statutory authority to borrow for operating purposes

Interest Income

- In the past, campus cash balances in general fund accounts earned interest income at average monthly short term rate (approximates 90 day T-bill)
 - Now it includes earnings on all Tier I investments
 - Last quarter, the annual rate was **0.94%**
- All other interest income is used to fund all VP offices and the President's strategic initiatives

90 day T-bill	Yield
Dec 2005	4.08%
Dec 2006	5.02%
Dec 2007	3.36%
Dec 2008	0.11%
Dec 2009	0.06%
Dec 2010	0.12%
Dec 2011	0.02%
Dec 2012	0.05%
Dec 2013	0.07%
Dec 2014	0.02%
Dec 2015	0.24%
Dec 2016	0.53%

Short-term interest rates are very low today

IU Operating Funds – Program Structure



Meets the highest standards of fiduciary duty

IU Operating Funds – Tiered Structure

Tier I

- Operating cash: provides for operating activities
- Enhanced cash: provides for self liquidity and consists of variable rate fixed income

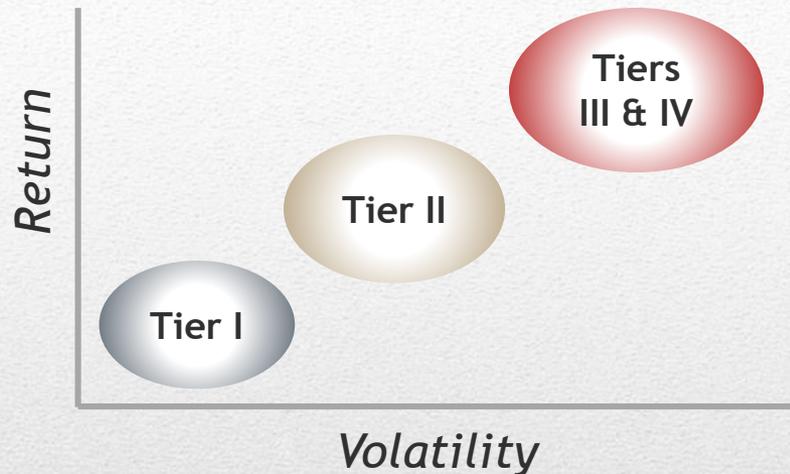
Tier II

- Core: reserves to replenish liquidity, if necessary

Tier III & IV

- Core Plus, Unconstrained: emergency reserves; seeks to maximize total return

IU Operating Funds – Investment Priorities



Tier	Liquidity	Return Potential
Tier I	Primary Source	Low
Tier II	Contingency	Moderate
Tier III & IV	Emergency	Higher

- The primary objective of the IUOF is to meet liquidity needs
- Investment returns are also crucial given the high opportunity cost and headwinds in the higher education

Unique Characteristics

- Liquidity/preservation focus
- Limited opportunity set
- Desire to reduce opportunity costs
- Strategic vs. Tactical Approach
- Long-term horizon
- Relatively stable industry with predictable cash flows

Tiered Liquidity Structure ensures funds are readily available for both expected and unexpected cash needs



RECENT ACTIVITIES WHERE WE ARE TODAY

Money Market Reform

What are the structural impacts to money market funds?

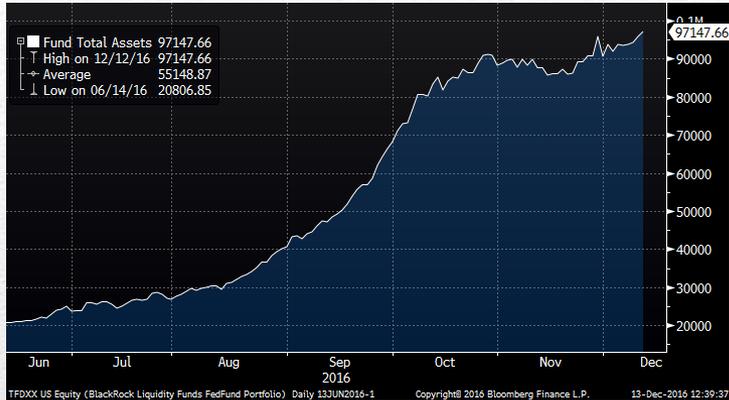
	Prime Institutional Funds	Government / Treasury Funds
Floating Net Asset Value	✓	
Liquidity Fees	✓	<i>Optional</i>
Redemption Gate	✓	
Stable NAV		✓
Other key changes to Rule 2a-7	<ul style="list-style-type: none"> ▶ Enhanced stress testing and diversification, compliance required by April 14, 2016 ▶ Increased transparency to daily market-based NAV and weekly liquid asset levels and net investor flows, compliance required by April 14, 2016 ▶ Basis point rounding for FNAV funds (to the fourth decimal place), compliance required by October 14, 2016 	

- Analyzed the implications of Money Market Reform
- Implemented a contrarian approach, stayed in Prime funds and took advantage of mispricing in securities markets
- Updated internal guidelines

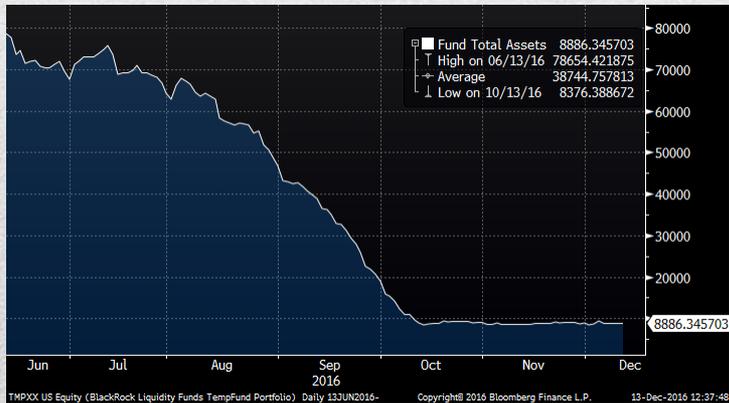
Continuous analysis of regulatory environment ultimately results in higher investment income

Money Market Reform

BlackRock TFDXX - Gov't MMF



BlackRock TMPXX - Prime MMF



Recent Trends

- Investors have shifted more than \$1 trillion away from prime funds that buy certificates of deposit, time deposit and commercial paper and flooded into government-only funds
- Triple-A rated and daily liquid prime funds enjoy unusually attractive yield due to low demand

Continuous analysis of regulatory environment results in higher investment income

Tier I – Operating Cash

Bank Accounts and Money Market Funds (MMF)

Strategy	Bank Accounts		Gov't MMF			Prime MMF
	(CZB)	(MAC)	JP Morgan Chase (CAL)	Northern Trust (STIF)	BlackRock (ROC)	BlackRock (TEMP)
Ticker Symbol			OGVXX	BGSXX	TFDXX	TMPXX
SEC Yield (annualized 7-day net yield)			0.32%	0.25%	0.33%	0.66%
Earnings Credit Rate (ECR) net of FDIC fee	0.53% (0.65% - 0.12%)	0.12% (0.25% - 0.13%)				
Assets (12/13/2016)			\$170.9B	\$23.4B	\$97.1B	\$8.9B

- Diversified Operating Cash
- Money Market Reform - October 2016
- Negotiated rates with banks - rates increased by 25bps
- Opened a new Prime Money Market account - rates increased by 30bps
- Increased annual investment return by \$300,000

Diversification - *Don't put all your eggs in one basket*

Tier I – Enhanced Cash

Managed by 3 independent investment managers with unique guidelines

General guidelines:

- The minimum average portfolio quality shall be AA- (S&P), Aa3 (Moody's), or AA- (Fitch)
- The maximum average duration of the portfolio shall be 1.5 years
- Annual net return was approximately 1.45% last year
- Optimize asset allocation
- Short-term investment program
 - Evaluate and invest excess operating cash

Earnings on the enhanced cash are 3 times higher than operating cash

CASH BALANCES

Daily Operating + Enhanced Cash Balances

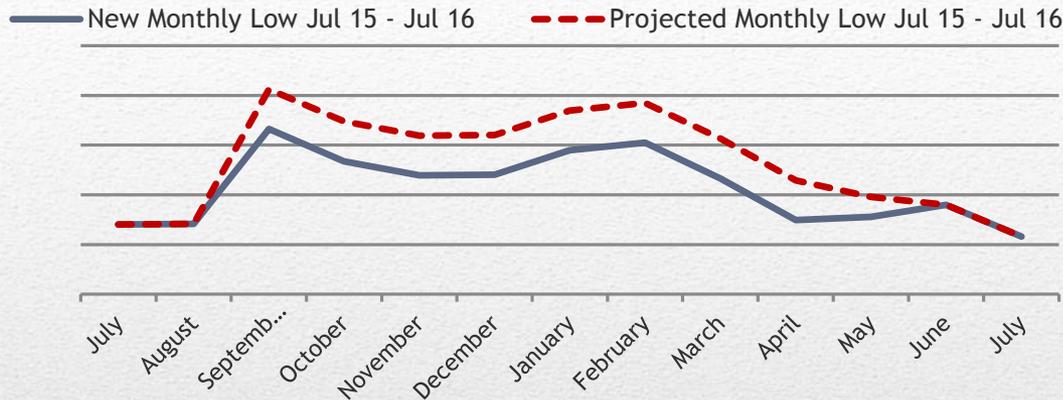
— FY 2015 — FY 2016



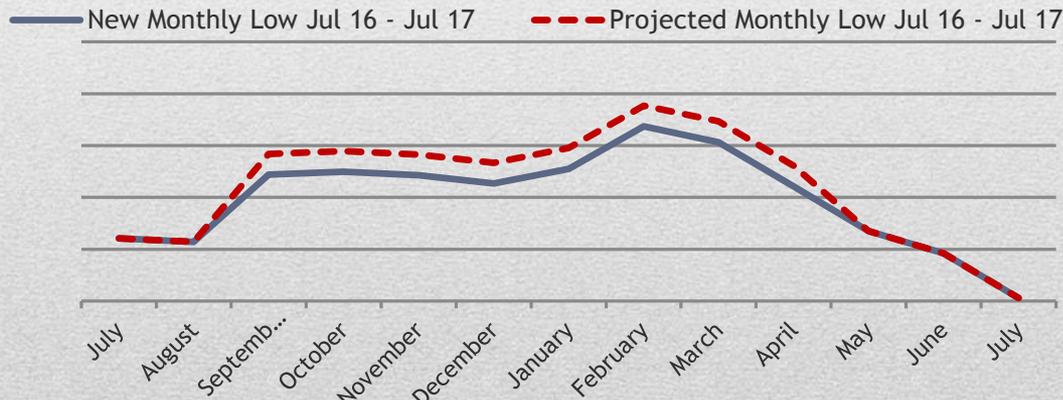
Long-term planning and disciplined business practices have allowed us to optimize the investment of operating cash balances

Short-term Investment Program

Cash Balances (excluding Enhanced Cash)



Cash Balances (excluding Enhanced Cash)



- Analyze and learn IU cash flow patterns
- Identify periods of high and low cash balances
- During the 9-10 months period of relatively high liquidity, withdraw and invest operating cash to triple earnings
- Redeem the investment for the period of low liquidity

The program is expected to earn \$2 million from FY15 through FY17 (\$1.3 million of incremental net income)

Tier II – Defensive Fixed Income

Managed by 4 independent investment managers with unique guidelines

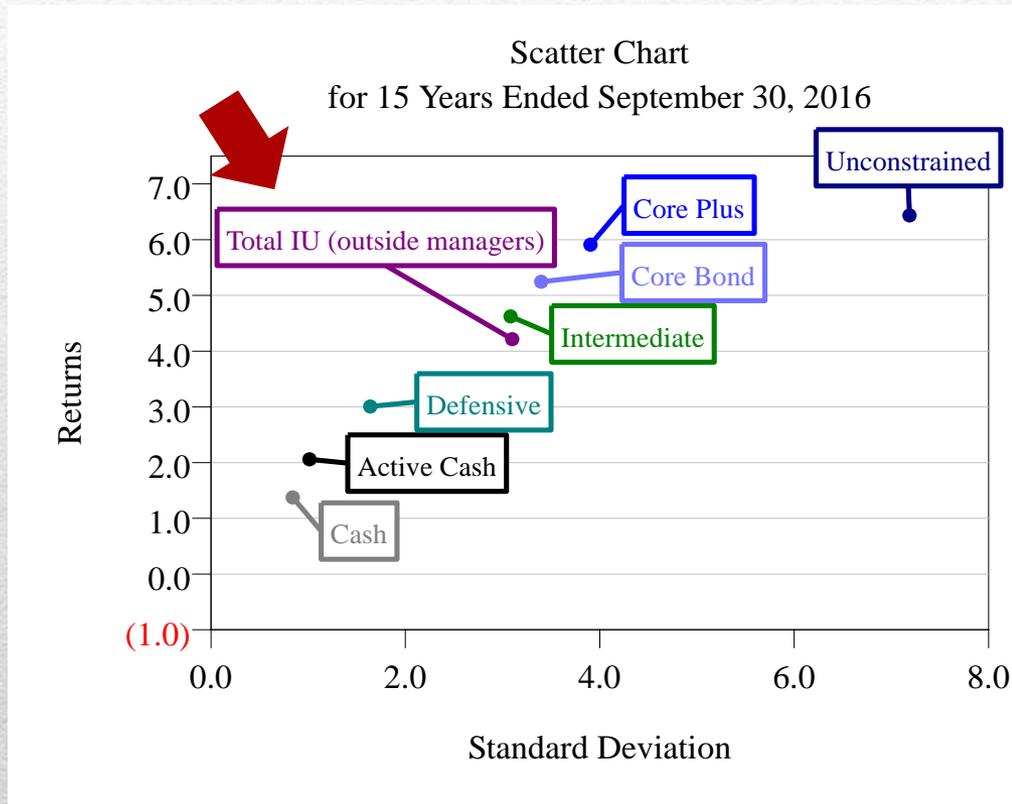
General guidelines:

- The minimum average portfolio quality shall be AA- (S&P), Aa3 (Moody's), or AA- (Fitch)
- The average duration of the portfolio shall be between 1-3 years
- Annual net return was approximately 1.95% last year
- Optimize asset allocation

Tier II earnings have been 0.5% higher than enhanced cash

Tier III and IV – Core Plus and Unconstrained

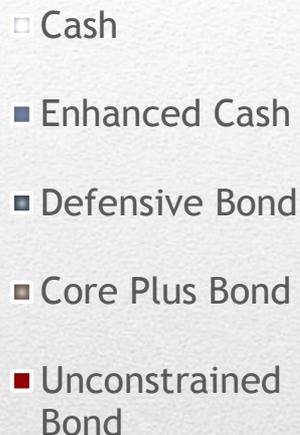
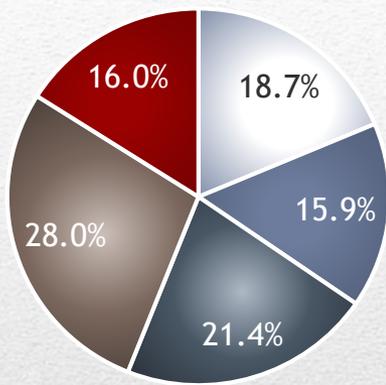
Managed by 3 independent investment managers with unique guidelines



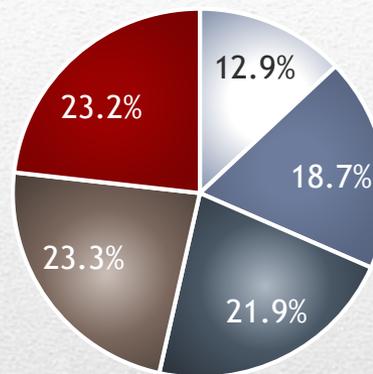
Earnings on Tier III and IV are 3 times higher than on enhanced cash

Continuous Assessment of Asset Allocation

September 2013



September 2016



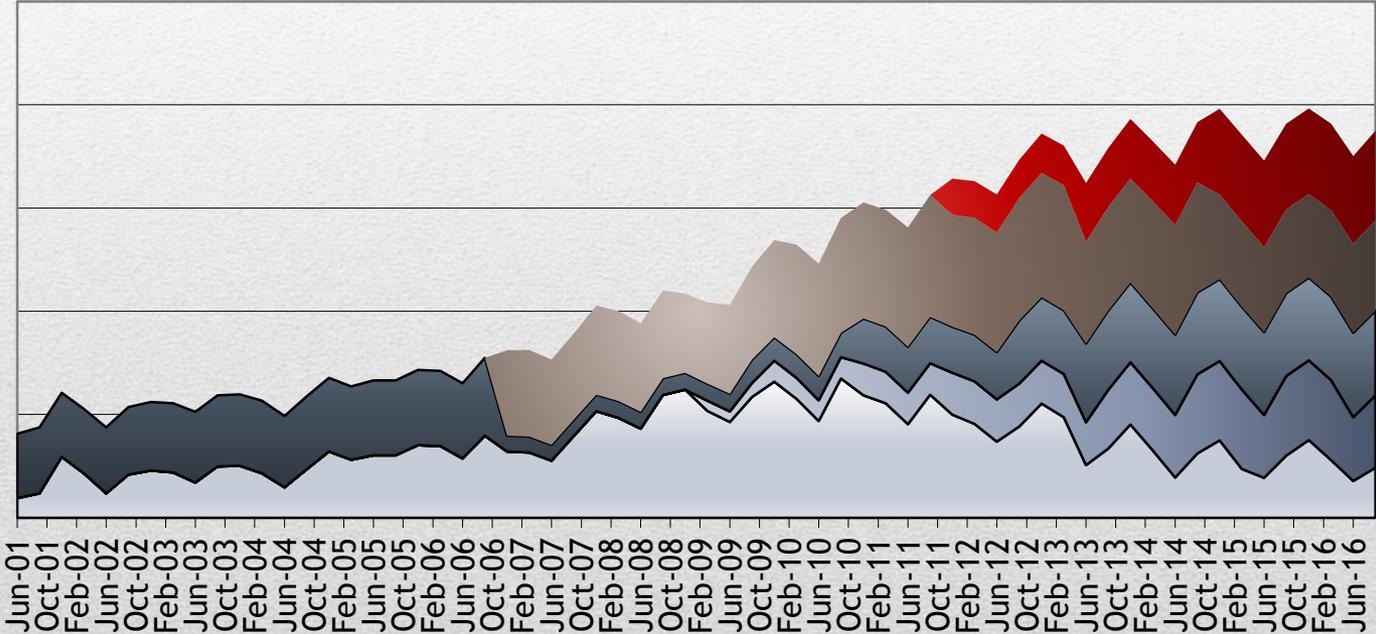
- Increased Tier IV - Unconstrained Bonds
- High allocation to liquidity and defensive strategies

Appropriately conservative fixed income portfolio - 53% allocation to defensive strategies

Tier History

IU fixed-income investment strategies

□ Liquidity ■ Enhanced Cash ■ Core ■ Core Plus ■ Unconstrained



New investment strategies funded; diversification enhanced

IUOF Performance vs. Index

Annual Returns ending September 30, 2016

	1 Year
Tier I	1.61%
Tier II	2.14%
Tier III	7.91%
Tier IV	5.27%
Net Total	<u>4.07%</u>
Blended IUOF Benchmark	0.76%
Barclays Aggregate Index	5.19%

Returns for every tier are before fees; total return is net of fees

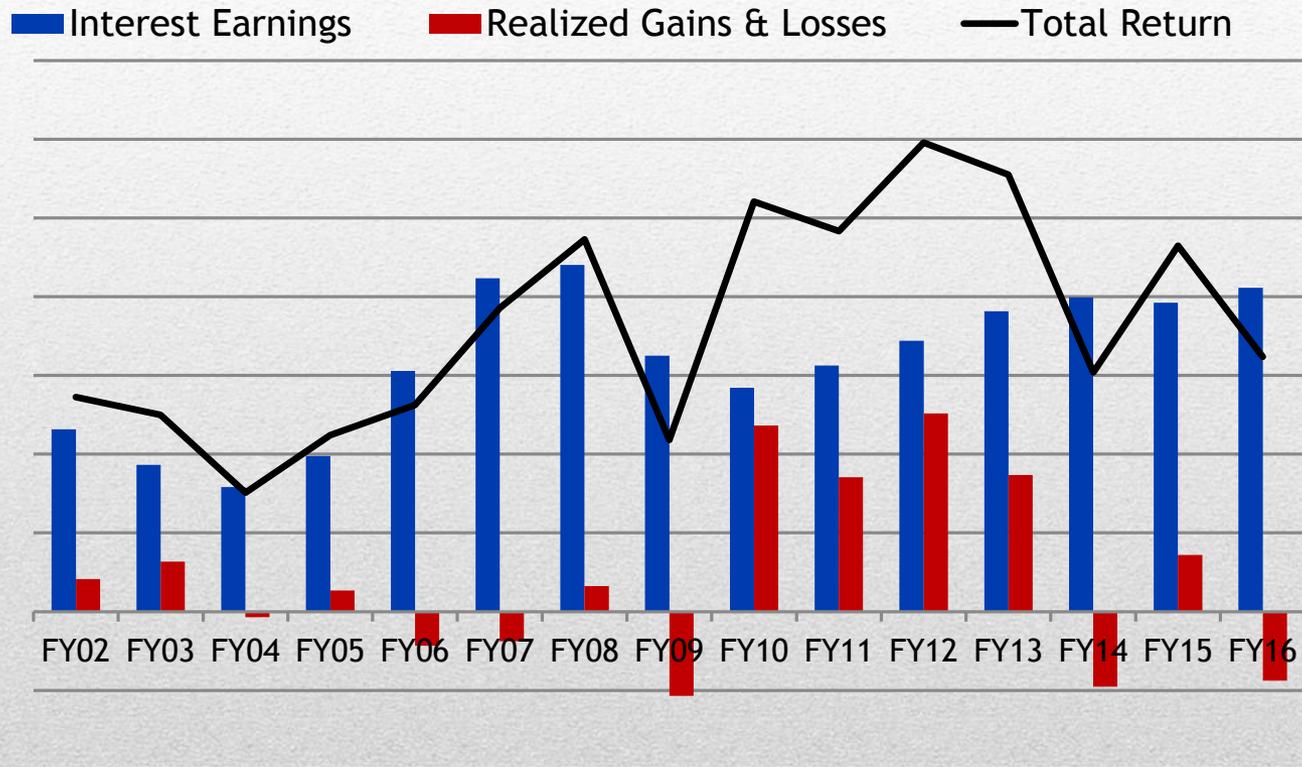
Actively managed fixed-income portfolio outperformed the passive index

The IUOF portfolio has outperformed its custom benchmark and performed in-line with the broader Barclays Aggregate Index, despite exhibiting a lower and more diversified risk profile.

IUOF portfolio has outperformed its benchmark

Investment Income – How have we done?

Interest Income and Realized Gains (Losses)



IU earned \$432.4 million in interest income and net realized gains during the last 10 years

IUOF Performance vs. Similar Investment Strategies

Performance Rankings vs. Callan Associates Investment Database as of 9/30/2016

	Last 5 Years	Last 10 Years
Strategy 1	61	46
Strategy 2	8	17
Strategy 3	42	21
Strategy 4	26	20
Strategy 5	54	21
Strategy 6	27	6
Strategy 7	N/A	N/A
Strategy 8	10	N/A
Strategy 9	20	16
Strategy 10	50	76
Strategy 11	45	N/A
Strategy 12	87	N/A
Strategy 13	4	8
Strategy 14	35	31

Expectations from active managers:

- Exceed the appropriate market index
- Total return and risk-adjusted return are consistently in the top 50th percentile versus an appropriate peer group

During the long term IUOF portfolio has outperformed its benchmark

Questions?

Appendix

- Actions Since 2008 Crisis
- Investment Policy Statement

Actions Since 2008 Crisis

- Money Market Reform
- Ongoing quantitative and qualitative analysis
- Investment style research and portfolio rebalancing
- Approx. \$790 million moved out of cash into higher yielding investments
- Short-term investment program
- Continued enhancement to cash forecasting model
 - Key drivers of cash inflows and outflows forecasted separately
- Termination of two managers
- Hiring of additional managers
 - Enhanced cash (Payden & Rygel, Logan Circle)
 - Minority owned manager (Smith Graham)
 - Defensive manager (Mesirow Financial and PIMCO)
 - Core Plus manager (Loomis)
 - A bank with headquarters in Indiana (Old National)
 - Unconstrained managers (Loomis, Reams and Western)
- Enhancements to investment policy
 - Negotiated and reduced investment management fees
 - Updated specific guidelines for most strategies
 - Addition of Enhanced Cash and Unconstrained strategies

Consistent and strong financial performance of Indiana University contributed to the growth of the investment portfolio

Investment Policy Statement

- Securities guidelines
 - Fixed Income securities
 - Portfolio minimum average credit rating - “A”
 - Investments in high-yield, non U.S. emerging market and debt securities are permitted (exposure limited to 25% high-yield, 25% non U.S. with combined exposure not to exceed 40%)
 - Limitations on individual holdings
- Thorough Investment Strategy selection due diligence
- Clearly defined reporting and communication requirements
- Formal watch-list procedures
- Link to the IU Investment Policy:
<http://policies.iu.edu/policies/categories/financial/treasurers-office/FIN-TRE-VI-150-investment-policy.shtml>