FINANCIAL MARKETS AND INSTITUTIONS

MUTUAL FUNDS

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DEAMS
University of Trieste

AGENDA

- Rationale of mutual funds
- Performance measures: NAV
- Types of mutual funds

WHY MUTUAL FUNDS?

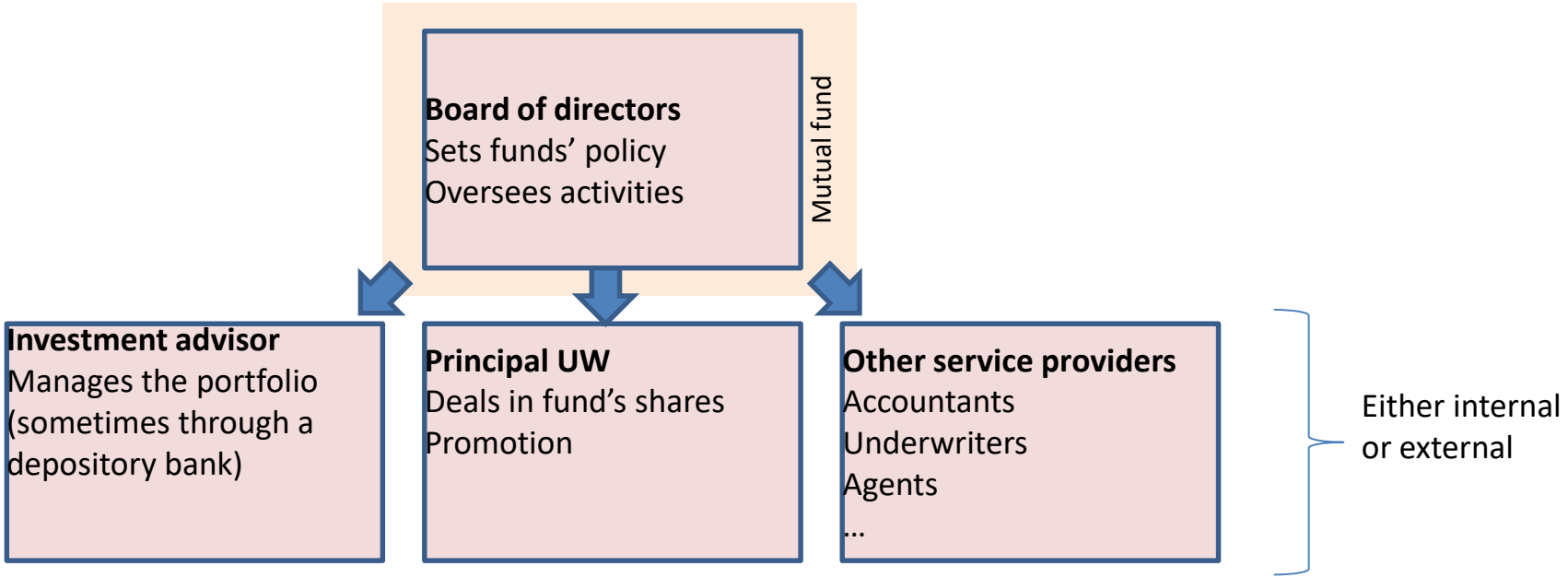
Impressive **exponential growth** in the last decades closely linked with their competitive advantage:

- **liquidity** of investments
- **access** to securities sold at large-denominations
- **diversification** also for small invested capitals
- **affordable** fees Vs huge transaction costs

- provision of **expertise** on a continual basis
- cheap and quick **transferability** of funds

How mutual funds?

Recurring structure



Otherwise, like investing in stocks:

- periodic earnings (sometimes)
- capital gains (mostly)

PERFORMANCE MEASURES

Main tool for evaluating funds' performance:

- $$\frac{\text{MARKET VALUE OF ASSETS} - \text{LIABILITIES}}{\text{NUMBER OF SHARES}}$$
- represents the current purchase or selling price
- tracks the *generic performance* over time

However other measures exist, since we are interested in:

- Funds' risks
- Specific performance of an investor
- Funds that "overperform" the market
- …

PERFORMANCE MEASURES

- Sharpe's ratio $SR = \frac{r_P - r_f}{\sigma_P}$
- Modigliani's ratio $M = \frac{r_p - r_f}{\sigma_p}\sigma_m$
- Treynor's ratio $Treynor = \frac{r_p - r_f}{\beta_P}$
- Sortino's ratio $Sortino = \frac{r_p - r_f}{DSR}$

Different «risk» measures: absolute and relative st.dev., beta (relative market volatility), *downside risk*

- MWRR $MWRR = R(t_0, T) = \frac{V(T) - V(t_0) - F}{\overline{V}(t_0, T)}$

Effective *performance* based on individual choices: net in/outflows and average invested amounts

- Tracking error $TE = \sigma_{r_p - r_B}$

St. dev. of differences in returns from benchmark

TYPES OF MUTUAL FUNDS

Among several potential cathegories, a few emerge:

- **close-end**:
  - mutual funds' shares are fixed in number at the initial offering
  - withdrawals and new investments are not possible
  - entering/exiting only finding somebody willing to exit/enter
- **open-end**:
  - new investors can get new shares, buy-back/liquidation option
  - the fund has a variable number of shares

Example

In 2016 Germany had:

- *3.500 closed-end funds, AUM 83 bln €*
- *6.000 open-end funds, AUM of 1.800 bln €*

Why?

TYPES OF MUTUAL FUNDS

Main investment target:

- **equity** funds: aiming at current income (dividends), capital gains or a combination (i.e. total return funds)
- **bond** funds: government, corporate, currency, maturity, …
- **money market** funds: short-term, versatile and cheap
- **hybrid** funds: stocks and bonds together
- **index** funds: passive management (f.i. ETFs, ETCs, …)
- **hedge** funds: seeking pricing anomalies from predicted paths, often unregulated and/or offshore, longer term to cope with higher risk, frequent use of leverage

TYPES OF MUTUAL FUNDS

Fee structure:

- **load funds**: commissions are paid to intermediaries up-front reducing the investment
- **deferred load funds**: fees are charged when leaving the fund, usually with declining % (redemption fee)
- **no-load funds**: sold directly with no entry/exit charges

Several other fees exist:

- costs of **switching** between complexes and families
- periodic **administrative** or similar fees
- income **sharing** features
- …

EXAMPLES

1. Two mutual funds differ for their costs: Fund 1 has a 6% upfront fee and running fees for 1%. Fund 2 has a 4% final fee and running fees for 1.2%. Assuming a return of 10%, which one performs better for the investor in 5, 10, 15 and 20 years? What if the gross return starts at 5% and grows every year by 0.5%? What if the gross return starts at 7.5%, grows every year by 0.5% until it reaches 11%, then a market shock pushes it back to -10% for 1 year, -5% for another year, and then to 5% growing again at a 0.5% pace?

$$FV_1 = (1 - ef_1) \cdot (1 + i - rf_1)^t$$

$$FV_2 = (1 + i - rf_2)^t \cdot (1 - ff_2)$$

	Fund 1	Fund 2
5 y	1.45	1.46
10 y	2.23	2.23
15 y	3.42	3.40
20 y	5.27	5.19

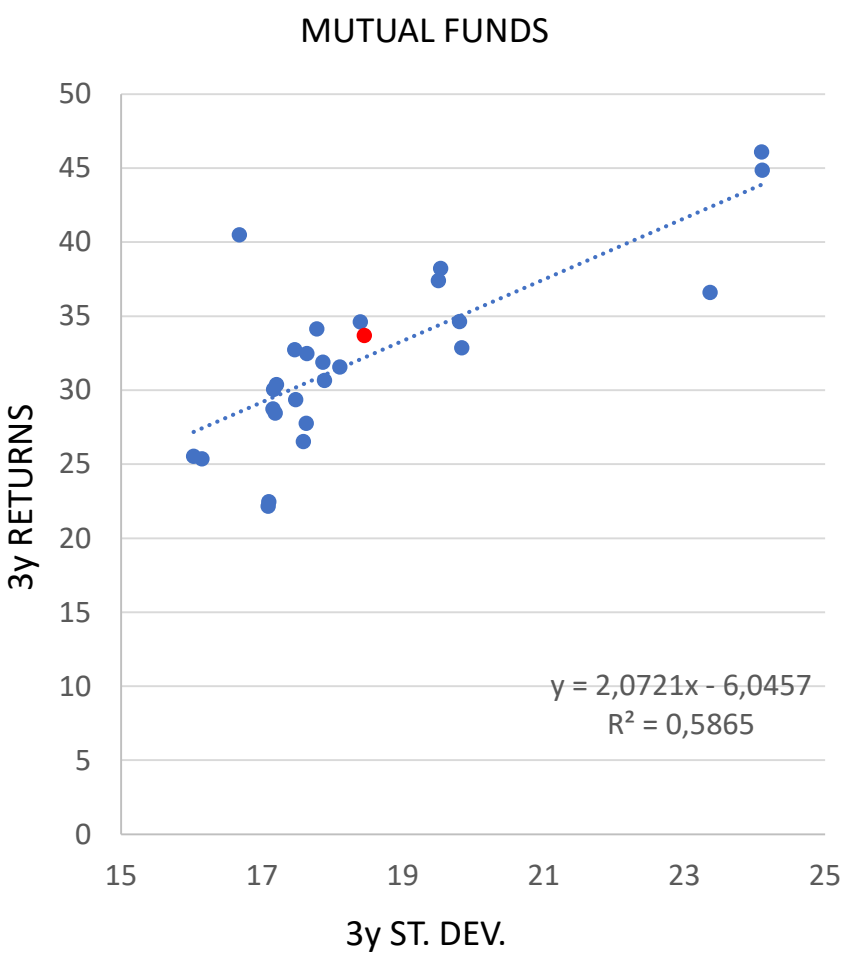
$$FV_1 = (1 - ef_1) \cdot \prod_{h=1}^{t} (1 + i_h - rf_1)$$

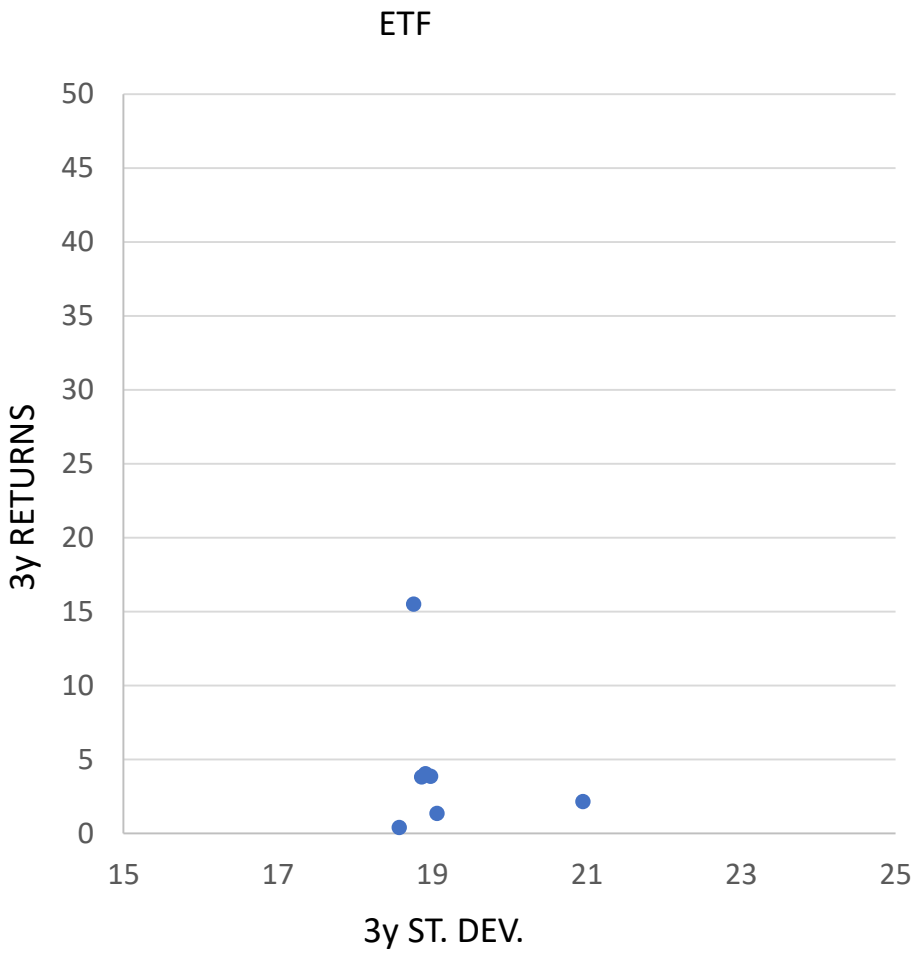
$$FV_2 = \prod_{h=1}^{t} (1 + i_h - rf_1) \cdot (1 - ff_2)$$

	Fund 1 A	Fund 2 A	Fund1 B	Fund 2 B
5 y	1.20	1.23	1.35	1.38
10 y	1.72	1.76	1.48	1.51
15 y	2.77	2.83	1.89	1.93
20 y	5.00	5.10	2.71	2.77

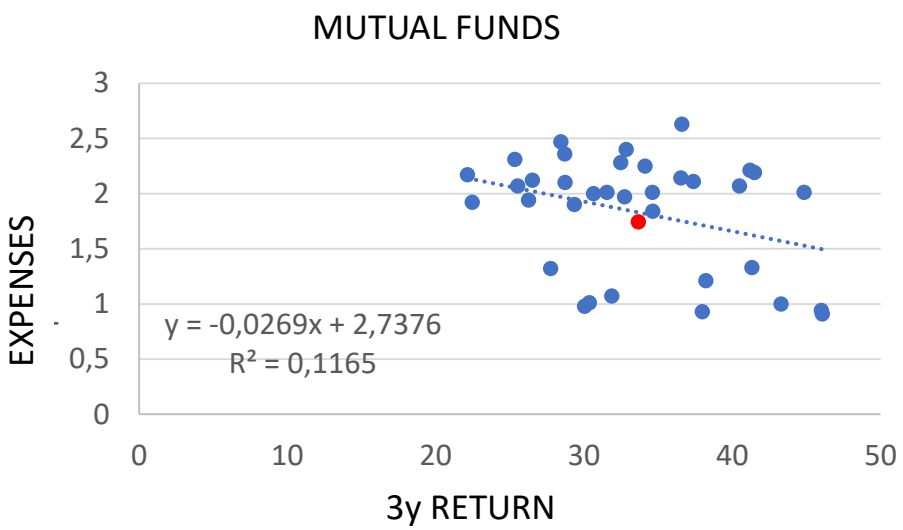
EXAMPLES

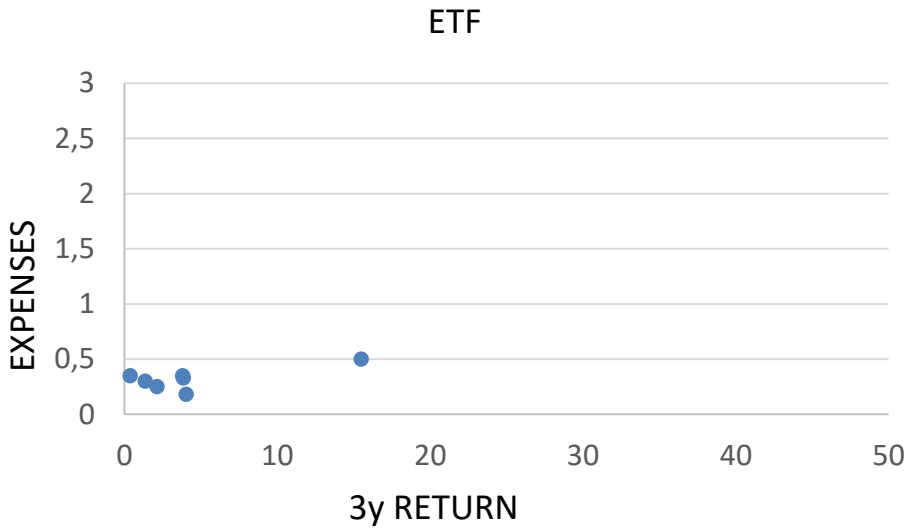
2. Several websites provide plenty of data on mutual funds (f.i. Morningstar). Consider the following comparison of Italian funds specialised in Italian stocks and dedicated to the retail market (07/2017). Comments?

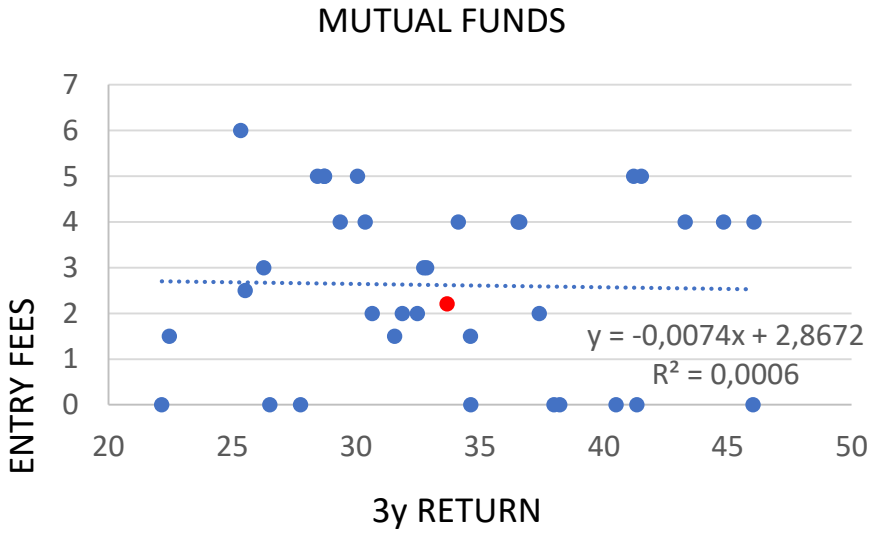


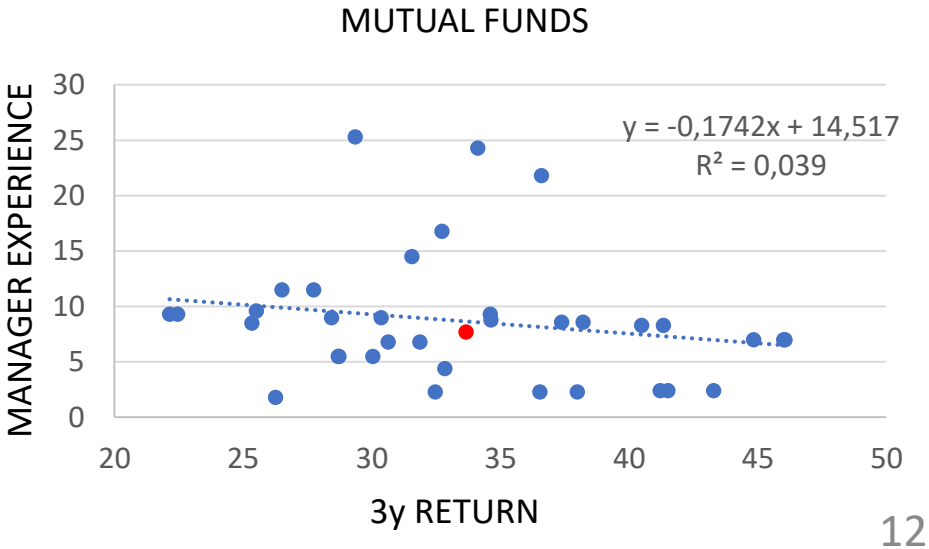


EXAMPLES


MUTUAL FUNDS
EXPENSES
3y RETURN
y = -0,0269x + 2,7376
R² = 0,1165

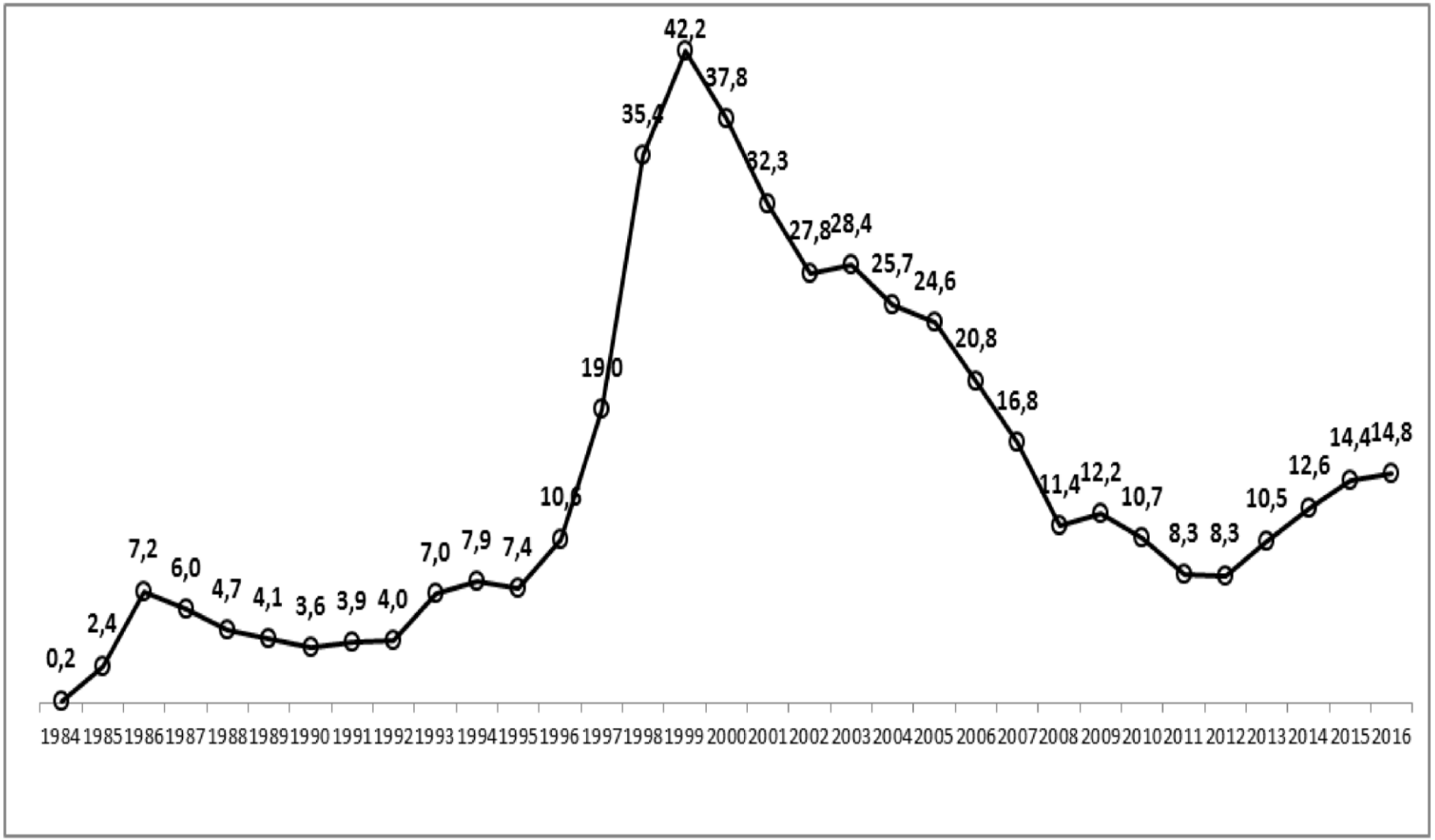

ETF
EXPENSES
3y RETURN


MUTUAL FUNDS
ENTRY FEES
3y RETURN
y = -0,0074x + 2,8672
R² = 0,0006


MUTUAL FUNDS
MANAGER EXPERIENCE
3y RETURN
y = -0,1742x + 14,517
R² = 0,039

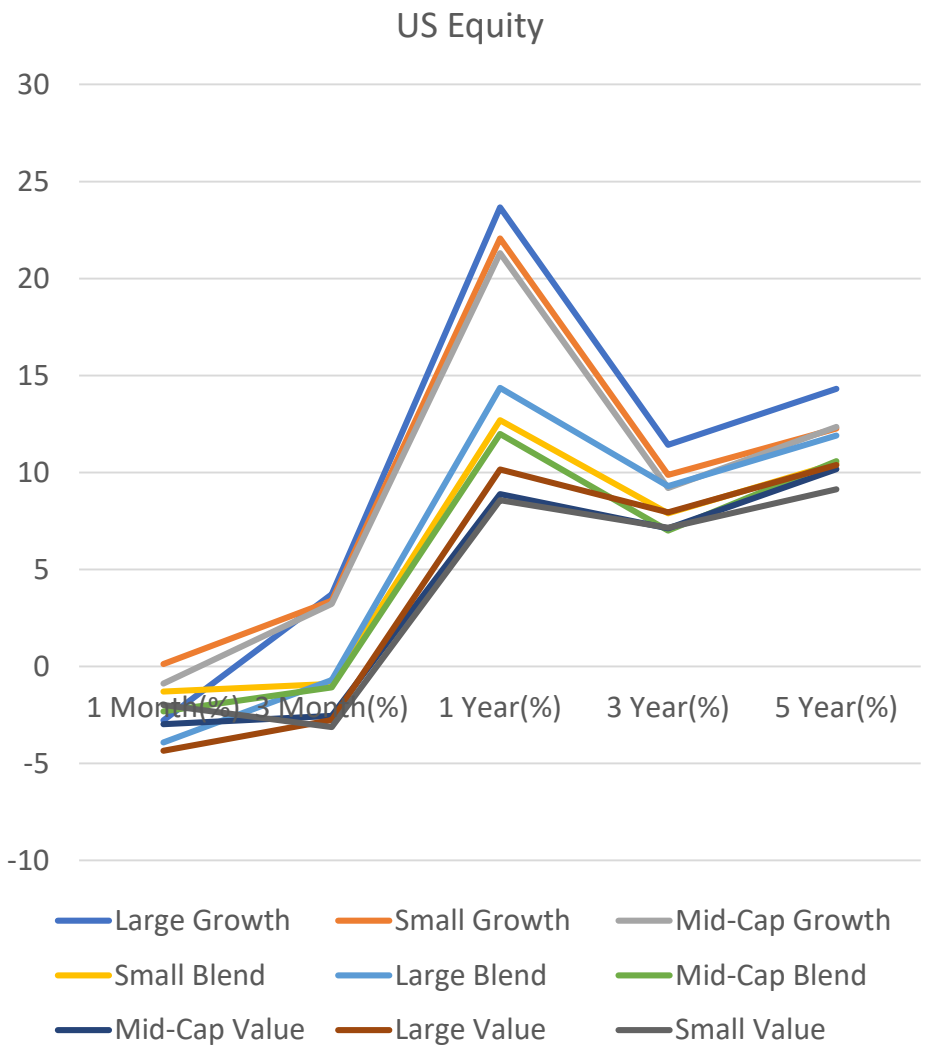
EXAMPLES

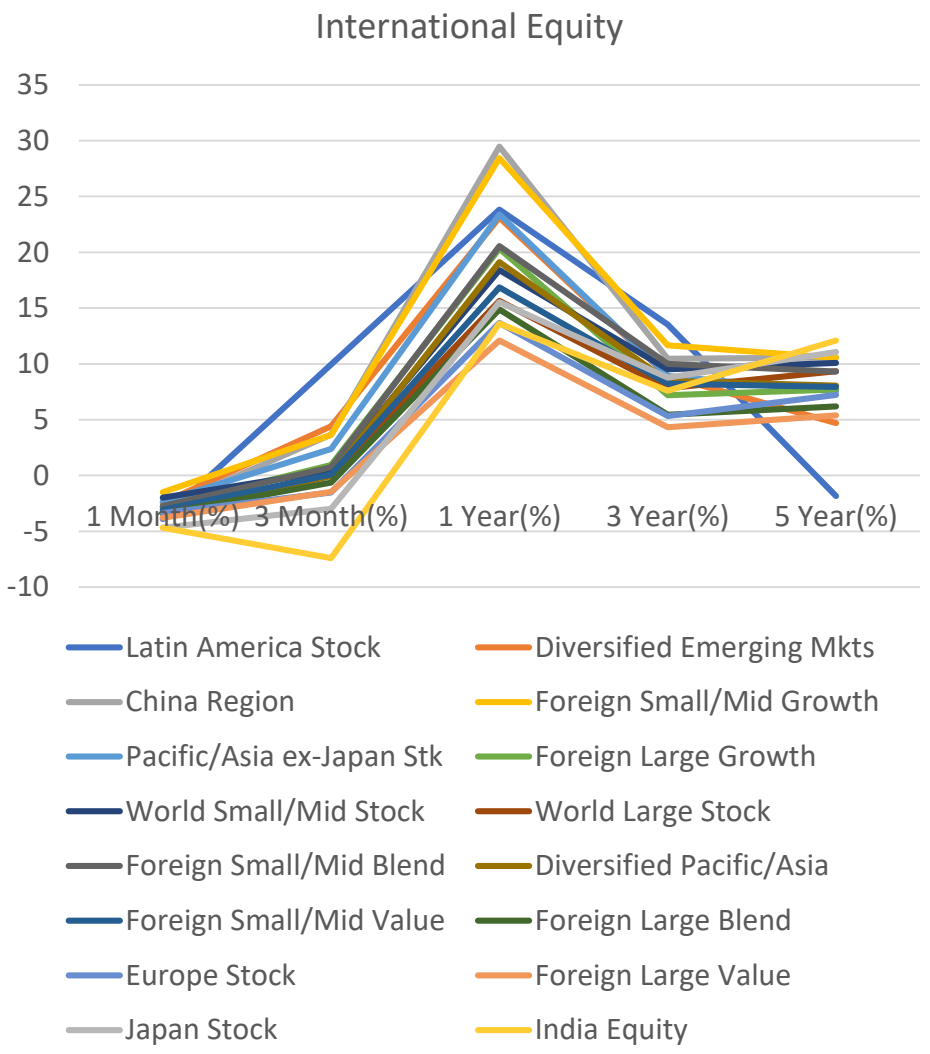
3. Italian mutual funds AUM as % of GDP. Comments?



EXAMPLES

4. Global funds: returns and categories (March 2018)





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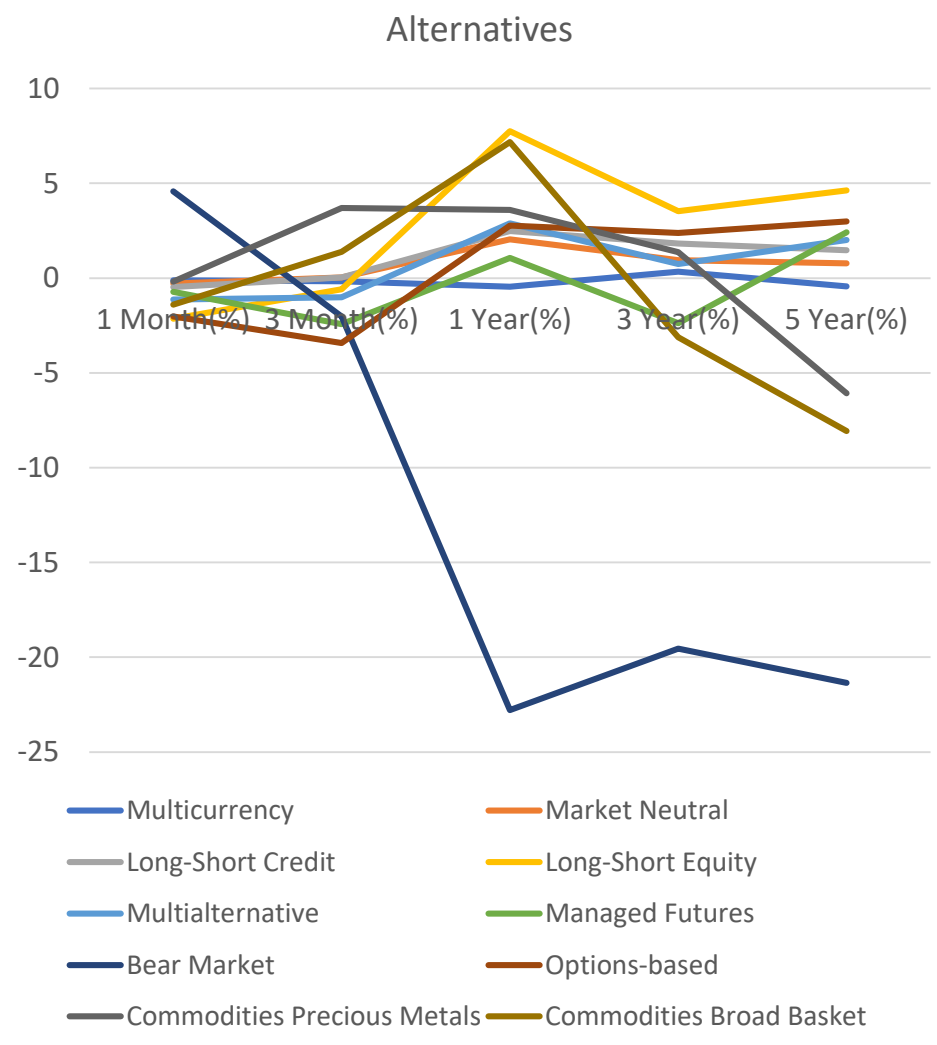
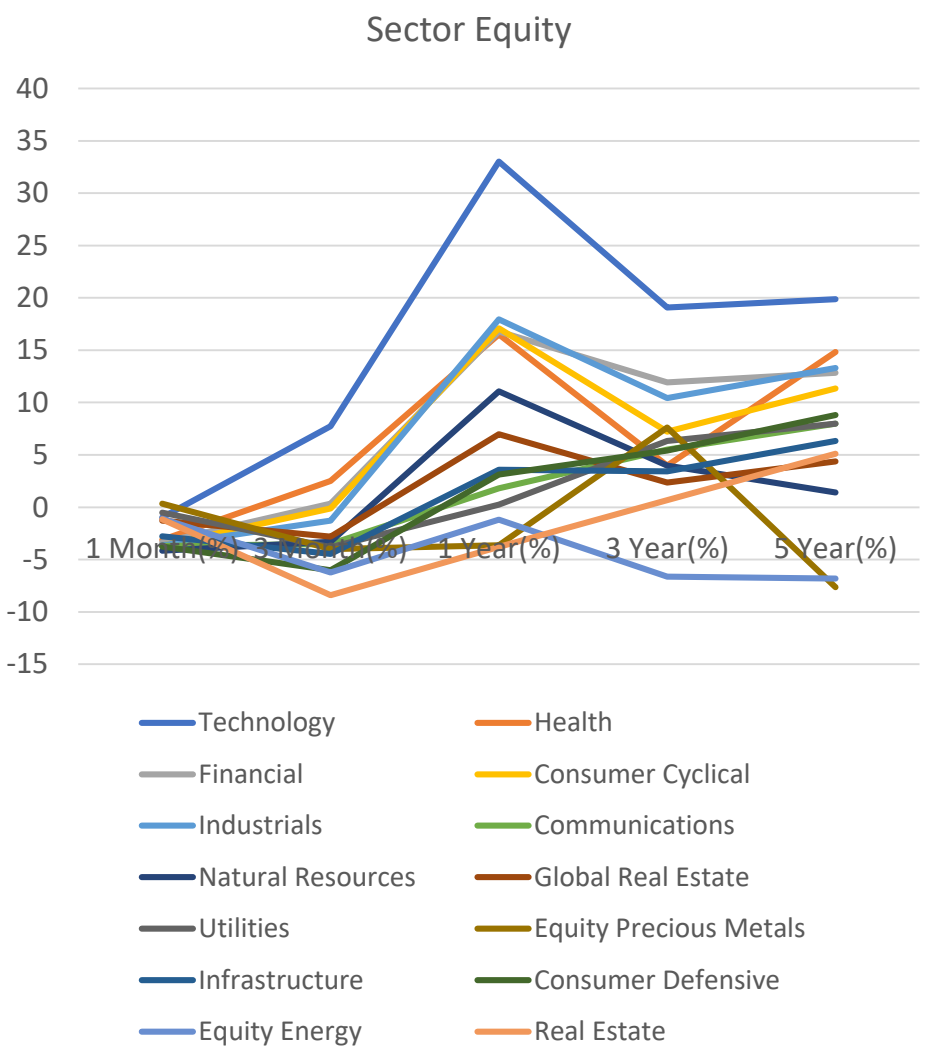
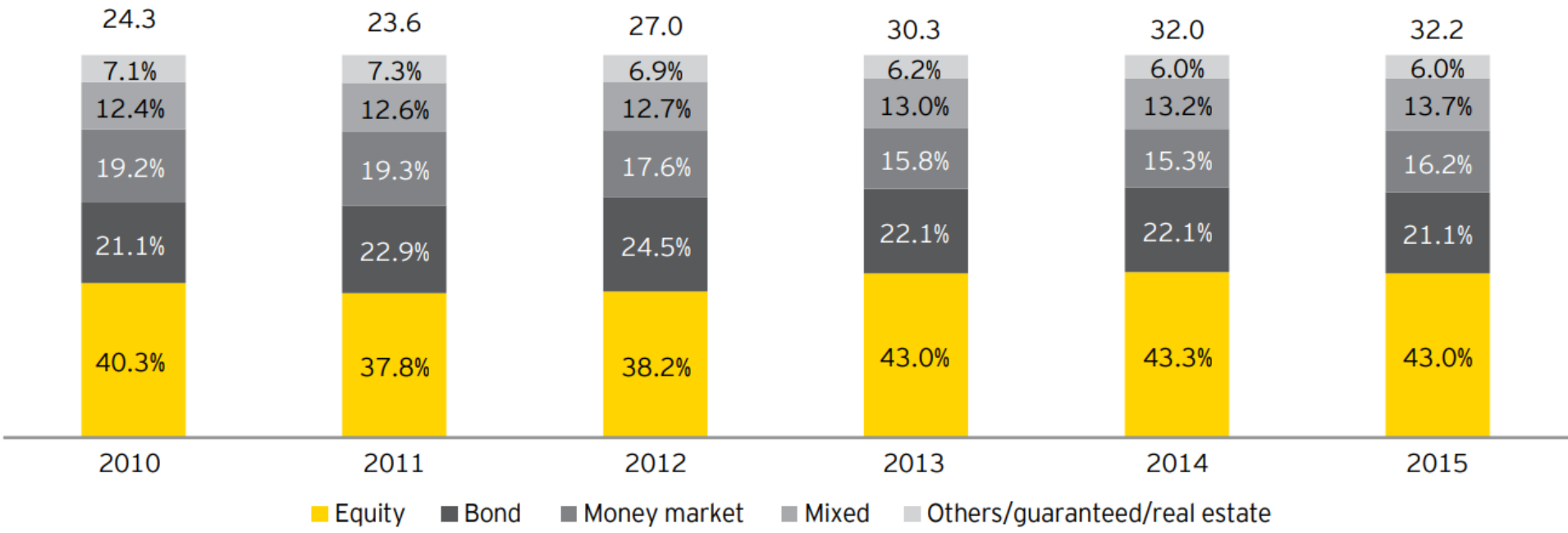




EXAMPLES

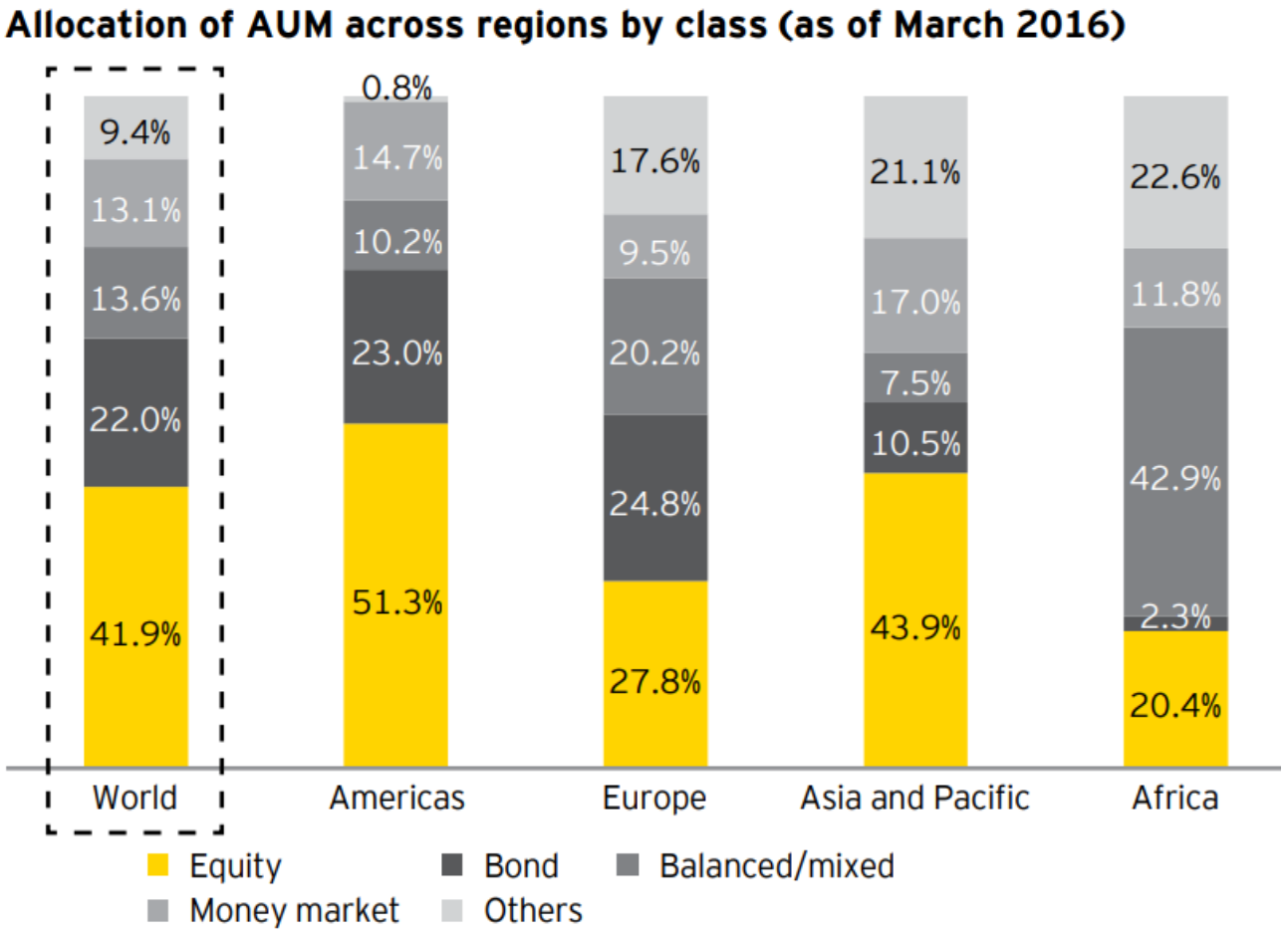
5. Mutual funds AUM by class

Global AUM (US$ trillion) across traditional mutual fund asset classes



EXAMPLES

5. Mutual funds AUM by class



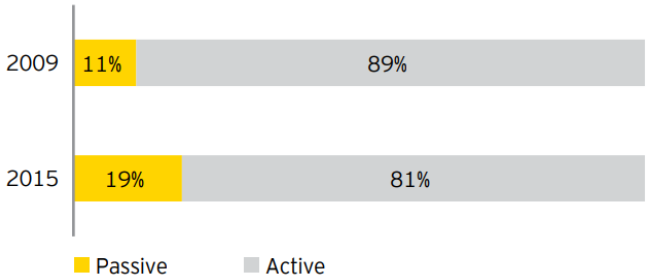
EXAMPLES

6. Passive or active?

10 year selected global fund performance data (as of December 2015)

Region and risky asset	Active managers	Benchmark	Difference
France equity	4.0%	4.7%	(0.8%)
Germany equity	6.6%	7.4%	(0.8%)
Italy equity	0.0%	(0.9%)	0.9%
Spain equity	2.6%	2.9%	(0.3%)
Netherland equity	3.1%	7.2%	(4.1%)
U.S. equity	5.8%	7.4%	(1.6%)
U.S. real estate	5.4%	7.3%	(1.9%)
U.S. long-term government bonds	3.8%	6.7%	(2.9%)
U.S. short-term government bonds	2.2%	2.5%	(0.3%)
U.S. MBS	3.9%	4.6%	(0.7%)
Emerging markets bonds	4.4%	6.7%	(2.3%)

Share of global asset management market



Global ETF AUM and their percentage to mutual funds' AUM