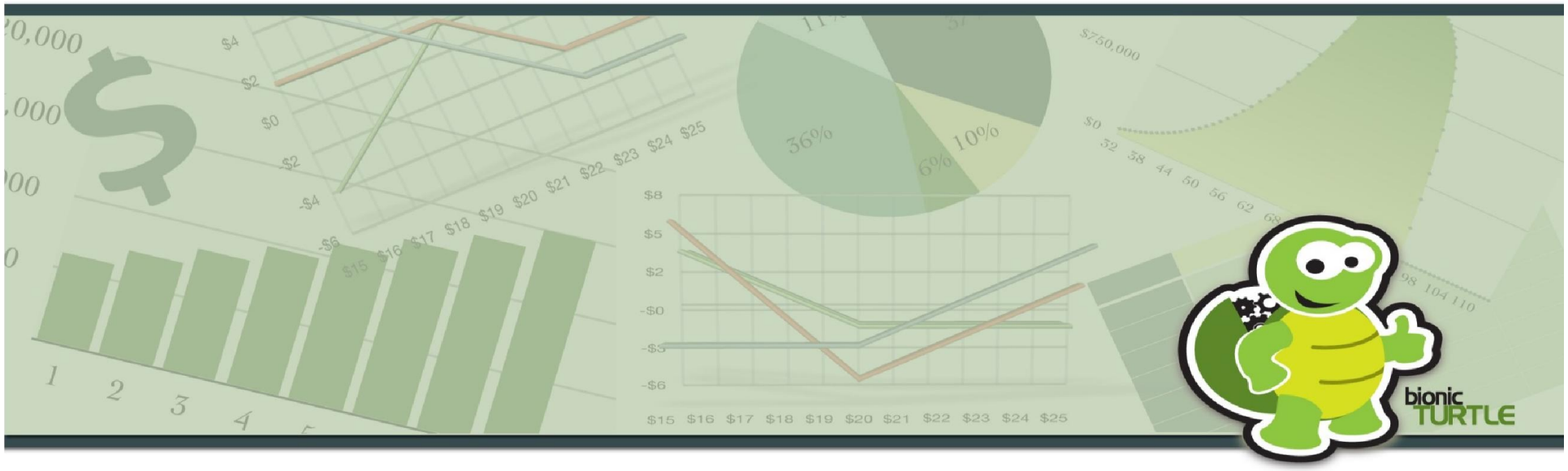


P1.T3. Financial Markets & Products

Hull, Risk Management and Financial Institutions

Mutual Funds and Hedge Funds

Bionic Turtle FRM Video Tutorials

By David Harper, CFA FRM

BIONIC TURTLE

Mutual Funds and Hedge Funds

- Differentiate among open-end mutual funds, closed-end mutual funds, and exchange traded funds (ETFs).
- Calculate the net asset value (NAV) of an open-end mutual fund.
- Explain the key differences between hedge funds and mutual funds.
- Calculate the return on a hedge fund investment and explain the incentive fee structure of a hedge fund including the terms hurdle rate, high-water mark, and clawback.
- Describe various hedge fund strategies, including long/short equity, dedicated short, distressed securities, merger arbitrage, convertible arbitrage, fixed income arbitrage, emerging markets, global macro, and managed futures, and identify the risks faced by hedge funds.
- Describe hedge fund performance and explain the effect of measurement biases on performance measurement.

Differentiate among open-end mutual funds, closed-end mutual funds, and exchange-traded funds (ETFs).

Open-End Mutual Funds

The total number of shares outstanding goes up as investors buy more shares and goes down as shares are redeemed.

- Shares can be bought or sold back to the fund at any time.

- They are **valued once a day, at 4 p.m**. When an investor issues instructions to buy or sell shares, the value calculated at the end of the day is applied for the transaction made before that time during that day.
- The value of each share is calculated in terms of net asset value (NAV) of the fund:

  NAV = total value of the portfolio ÷ number of shares outstanding;

  total value of the portfolio in turn is calculated as the sum of market values of each asset in the portfolio.

BIONIC TURTLE

Differentiate among open-end mutual funds, closed-end mutual funds, and exchange-traded funds (ETFs).

Taxation of open-end mutual fund

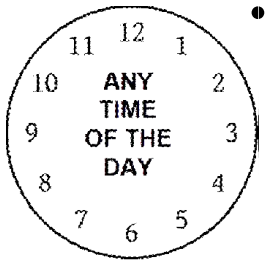
- In an open-end mutual fund, the investor pays tax as though he owned the securities in which the fund has invested. When the fund receives a dividend, an investor has to pay tax on his share of the dividend, even if the dividend is reinvested in the fund for the investor.
- When the fund sells securities, the investor is made to realize an immediate capital gain or loss, even if the he has not sold any of his shares in the fund.

BIONIC TURTLE

Differentiate among open-end mutual funds, closed-end mutual funds, and exchange-traded funds (ETFs) (continued)

Closed-End Mutual Funds

- They have a **fixed number of shares outstanding**.
- Like regular corporations and the shares of the fund are traded on a stock exchange which means they can be **bought and sold during any time of the day**.



- For closed-end funds, two NAVs can be calculated.
  1. Price at which the shares of the fund are trading.
  2. Fair market value: market value of the fund's portfolio divided by the number of shares outstanding. Usually a closed-end fund's share price is less than its fair market value. Fees paid to fund managers are considered to be a reason for this.

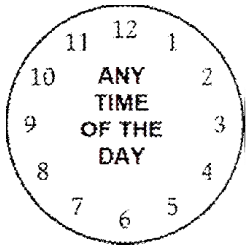
BIONIC TURTLE

Differentiate among open-end mutual funds, closed-end mutual funds, and exchange-traded funds (ETFs) (continued)

Exchange-traded Funds (ETFs)

- Created by institutional investors. Most track an index; e.g., SPDR tracks the S&P 500

- Some or all of the shares in the ETF are traded on a stock exchange Characteristics of a closed-end fund but (because institutions can exchange large blocks ETF shares for underlying assets) there is never a material difference between ETF exchange-traded share price and its fair market value (FMV).



- ETFs can be **bought or sold at any time of the day**. They can be shorted just like a stock.

- ETF holdings are **disclosed twice a day** thereby providing investors with more information about assets underlying the fund unlike mutual funds which disclose their holdings relatively infrequently.

Calculate the net asset value (NAV) of an open-end mutual fund.

To obtain the value of each share for an open-end mutual fund, the mutual fund manager first calculates the market value of each asset in the portfolio so that the total value of the fund is determined.

This total value is divided by the number of shares outstanding to find out the value per share called the **net asset value (NAV)** of the fund.

- For example, if the total value of the all the assets in the fund is calculated to be $100 million and if the number of outstanding shares is 2 million, then NAV is $50 per share (=100/2).

BIONIC TURTLE

Explain the key differences between hedge funds and mutual funds.

Mutual funds	Hedge funds
• Invest money on behalf of relatively small investors. • Accept investments from retail investors they are subjected to higher level of regulation.	• Seek to attract funds from wealthy individuals and large investors such as pension funds. • Free from regulations and are given more flexibility in terms of investment strategies.

The fees are relatively higher and dependent on performance for a hedge fund.

- A hedge fund fee might be “2 plus 20” indicating that the fund charges 2% per year of assets under management and 20% of net profit. In addition to high fees, there is usually a **lock up period** (cannot withdraw) of at least one year.
- In case of a mutual fund, a front-end load is a fee charged by some funds when an investor first buys shares. In the United States, front-end loads are restricted to less than 8.5% of the investment. Back-end load is the fee charged by some funds when an investor sells shares. The back-end load declines with the length of time the shares in the fund have been held.

BIONIC TURTLE

Calculate the return on a hedge fund investment and explain the incentive fee structure of a hedge fund including the terms hurdle rate, high-water mark, and clawback.

Example: Calculation of Hedge fund return

	Fund A	Fund B	Average	Both funds
Returns before fees	20.0%	-10.0%	5.0%	5.0%
Fees paid	5.6%	2.0%	3.8%	2.6%
Return to investors after fees			1.2%	2.4%

BIONIC TURTLE

Calculate the return on a hedge fund investment and explain the incentive fee structure of a hedge fund including the terms hurdle rate, high-water mark, and clawback (continued)

Incentives of Hedge Fund Managers

- Assume 0.40 probability of a +60% profit and a 0.60 probability of a -60% loss for a hedge fund that charges the industry standard fee of "2 plus 20." The expected return = **0.4 × 60% + 0.6 × (−60%) = –12%.**
- Although the return is negative, the manager still earns a fee on it
  - For a 60% profit the hedge fund's fee is 2 + 0.2 × 58 = 13.6%.
  - For the 60% loss, the hedge fund's fee is 2%.
  - The expected fee to the hedge fund is 0.4 × 13.6 + 0.6 × 2 = 6.64%
- The fee is 6.64% of the funds under administration. The expected management fee is 2%. The expected incentive fee is 4.64%. To the investors in the hedge fund, the expected return is negative: **0.4 × (60 - 0.2 × 58 - 2) + 0.6 × (−60 − 2) = −18.64 %**

Example: Returns of a high-risk investment where hedge fund fee is "2 plus 20"		
Returns	+60%	-60%
Probabilities	0.40	0.60
Expected return to hedge fund	**+6.64%**	
Expected return to investors	**-18.64%**	
Overall expected return	-12.00%	

BIONIC TURTLE

Calculate the return on a hedge fund investment and explain the incentive fee structure of a hedge fund including the terms hurdle rate, high-water mark, and clawback (continued)

Hull's EOC Question 4.17: Fund of Funds (FoF)

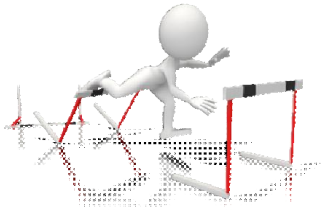
	Hedge Funds					
	Returns	Mgmt Fee	Return after Fee	Perform Fee	Total Fee	Net Return
	(A)			20%	(B)	(A-B)
1	-5.0%	2.0%	-7.0%	0.0000%	2.00%	-7.00%
2	1.0%	2.0%	-1.0%	0.0000%	2.00%	-1.00%
3	10.0%	2.0%	8.0%	1.6000%	3.60%	6.40%
4	15.0%	2.0%	13.0%	2.6000%	4.60%	10.40%
5	20.0%	2.0%	18.0%	3.6000%	5.60%	14.40%
Avg	**8.20%**				**3.560%**	**4.640%**

Fund of Funds		
Management fee	**1.000%**	
+ 10% Peformance fee	**0.364%**	*= 10% * (4.64% - 1.00%)*
Total FOF fees	**1.364%**	

Return earned by hedge funds	**8.200%**
Fees to hedge funds	**3.560%**
Fees to fund of funds	**1.364%**
Return to investor	**3.276%**

BIONIC TURTLE

Calculate the return on a hedge fund investment and explain the incentive fee structure of a hedge fund including the terms hurdle rate, high-water mark, and clawback (continued)



Hurdle rate: This is the minimum return that a hedge fund should produce in order for the incentive fee to be applicable.

High-water mark clause: This clause indicates that any previous losses must be recouped by new profits before an incentive fee applies.

- The high-water mark will vary among investors. A **proportional adjustment clause** states that if funds are withdrawn by investors, the amount of previous losses that has to be recouped is adjusted proportionally.

Clawback clause: This clause allows investors to apply part or all of previous incentive fees to current losses. A portion of the incentive fees paid by the investor each year is then retained in a *recovery account* and used to compensate investors for a percentage of any future losses.

BIONIC TURTLE

Describe various hedge fund strategies: Long/Short Equity. Identify the risks faced by hedge funds.

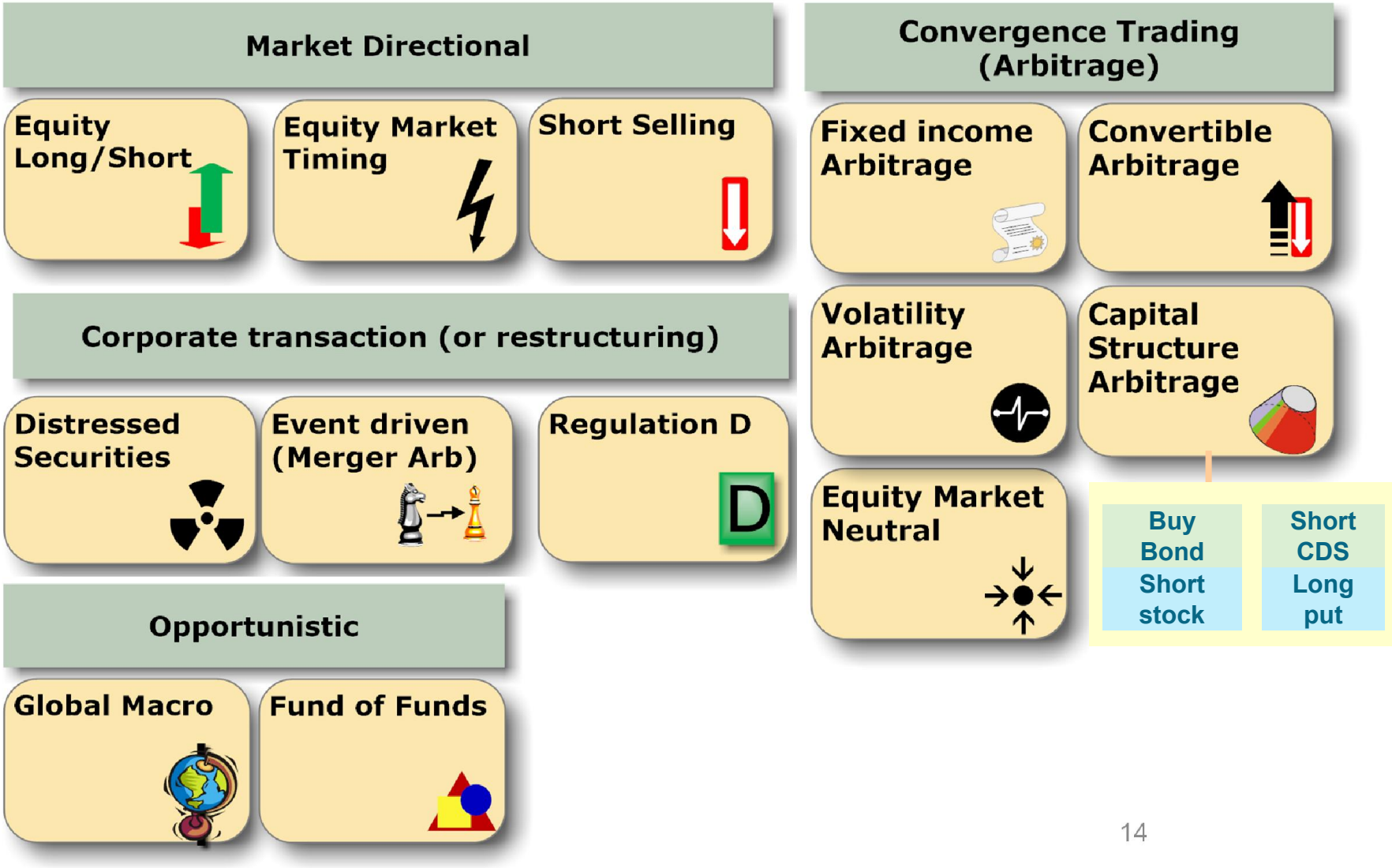
The hedge fund manager takes a long position in a group of stocks that are considered undervalued and a short position in a group that are considered overvalued by the market. The hedge fund manager may have a net long bias where the longs are bigger than the shorts or a net short bias where the short are bigger than the longs.

Some of the styles that can be created with this strategy include:

- An ***equity-market-neutral*** fund where longs and shorts are matched.
- A ***dollar-neutral*** fund is an equity-market-neutral fund where the dollar amount of the long position equals the dollar amount of the short position.
- A ***beta-neutral fund*** is an equity-market-neutral fund where the weighted average beta of the shares in the long portfolio equals the weighted average beta of the shares in the short portfolio so that the overall beta of the portfolio is zero or totally insensitive to market movements.
- Funds with **sector neutrality** where long and short positions are balanced by industry sectors.
- Funds with **factor neutrality** where the exposure to factors like the price of oil, the level of interest rates, or the rate of inflation is neutralized.

BIONIC TURTLE

Hedge fund strategies (typology from previous FRM author)



Describe various hedge fund strategies: Dedicated Short and Distressed Securities. Identify the risks faced by hedge funds

Dedicated Short

Managers select overvalued companies and sell them short. This strategy exploits the fact that brokers and analysts are hesitant to issue sell recommendations.

Examples include:

- Companies with weak financials
- Companies that change their auditors regularly
- Companies that delay filing reports with the SEC
- Companies in industries with overcapacity
- Companies attempting to silence their short sellers

BIONIC TURTLE

Describe various hedge fund strategies: Dedicated Short and Distressed Securities. Identify the risks faced by hedge funds

Distressed Securities

Deals with trades related to distressed securities by calculating a fair value for these securities considering possible future scenarios and their probabilities.

- Distressed securities cannot be shorted, so managers look for a debt that is undervalued by the market.
- Managers must be well versed with bankruptcy proceedings, since distressed securities are highly susceptible to this condition
- Passive managers buy distressed debt when the price is below its fair value and wait while active managers might purchase a large position in outstanding debt claims so that they have the right to influence a reorganization proposal.

BIONIC TURTLE

Describe various hedge fund strategies: Merger Arbitrage. Identify the risks faced by hedge funds.

Merger arbitrage is a bet that a merger or acquisition deal will take place after it has been announced. Merger-arbitrage hedge funds are observed to generate steady but not huge returns. There are two main types of deals: ***cash deals*** and ***share-for-share exchanges*.**

Consider a cash deal in which Company A announces that it would acquire all the shares of Company B for $30 per share. The shares Company B were trading at $20 earlier and after the deal is announced its price jumps to $28. The price may not have risen as high as $30 because there is a chance that the deal will not go through and also it may take some time to factor into market prices. Merger-arbitrage hedge funds buy the shares in company B for $28 and wait, so that if acquisition happens at $30 or higher, the fund makes a profit of minimum $2 per share or more respectively. However, if deal does not go through, the hedge fund will take a loss.

Consider a share-for-share exchange in which Company A is willing to exchange one of its shares for four of Company B's shares. Assume that Company B's shares were earlier trading at 15% of the price of Company A's. After the announcement, Company B's share price might rise to 22% of Company A's share price. A hedge fund following a merger-arbitrage strategy would buy a certain amount of Company B's stock and at the same time short a quarter as much of Company A's stock to generates profits if the deal consummates.

BIONIC TURTLE

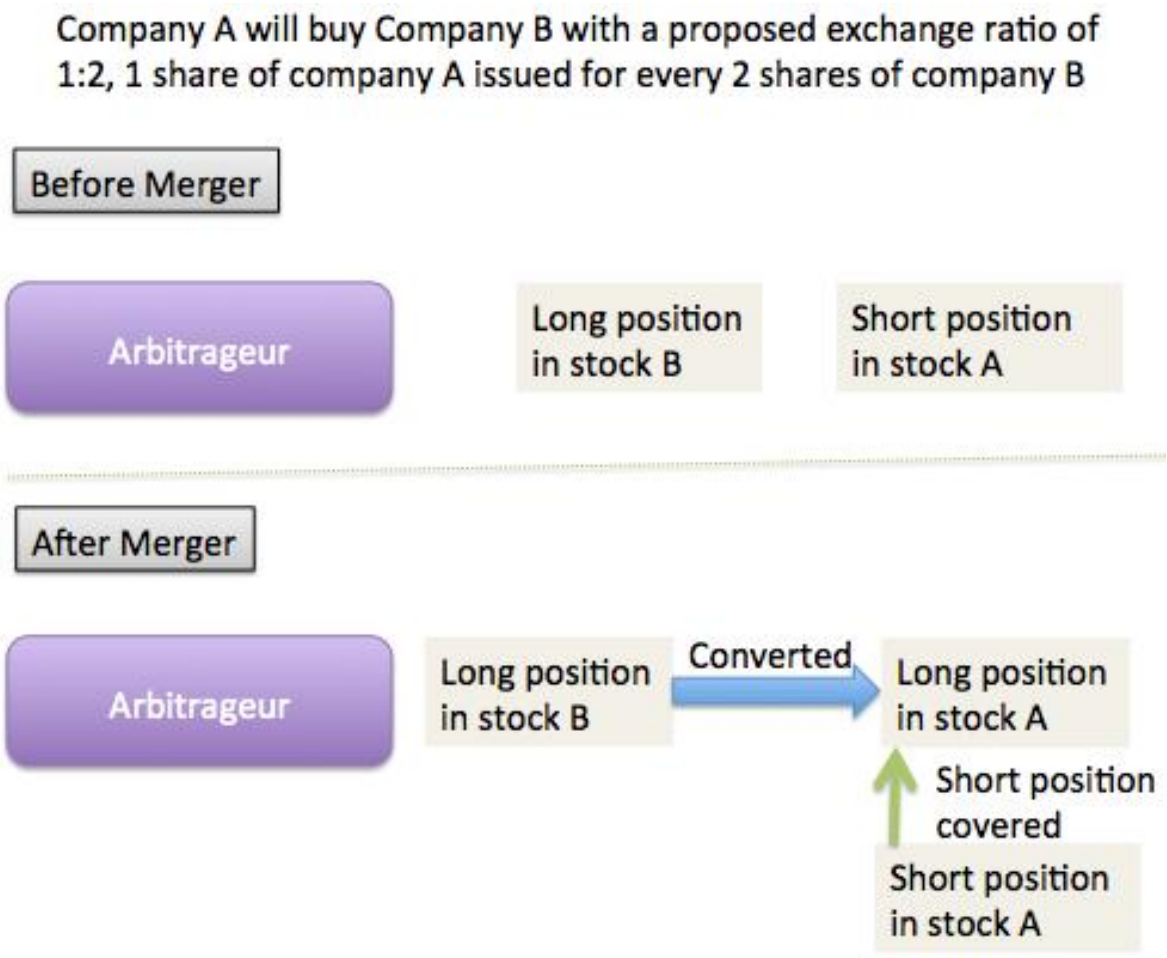
Describe various hedge fund strategies: Merger Arbitrage. Identify the risks faced by hedge funds.

- Tender offer made, at a premium to target's pre-tender price

Merger arbitrage: deal risk premium

Describe various hedge fund strategies: Merger Arbitrage. Identify the risks faced by hedge funds.

Stock-for-Stock Merger Arbitrage: Mechanics



Describe various hedge fund strategies: Convertible Arbitrage. Identify the risks faced by hedge funds.

Convertible bonds are bonds that can be converted into the equity of the bond issuer at a specified times and price in the future.

- The convertible bond price depends on factors such as the price of the underlying equity, its volatility, the level of interest rates, and the chance of the issuer defaulting.
- A hedge fund using the convertible arbitrage strategy develops a complex model for valuing these convertible bonds so as to extract higher returns from it.
- Many convertible bonds trade at prices below their fair value, so hedge fund managers buy the bond and then hedge their risks by shorting the stock.

BIONIC TURTLE

Describe various hedge fund strategies: Convertible Arbitrage. Identify the risks faced by hedge funds.

A convertible arbitrage strategy involves taking long position in a convertible bond and hedging it by taking short position in the underlying stock.

BIONIC TURTLE

Describe various hedge fund strategies: Fixed Income Arbitrage. Identify the risks faced by hedge funds.

Fixed Income Arbitrage

One of the strategies followed by hedge fund managers in relation to fixed income arbitrage is a ***relative value*** strategy, where they buy bonds that the zero-coupon yield curve indicates are undervalued by the market and sell bonds that it indicates are overvalued.

Market-neutral strategies are similar except that they have no exposure to interest rate movements.

- Some fixed-income hedge fund managers follow ***directional*** strategies where they take a position based on beliefs that certain spread between interest rates, or interest rates themselves, will move in a certain direction. Usually they have a lot of leverage and have to post collateral.
  - The risk associated with this strategy is that although the strategy may work out well in the long term, in the short term if the market goes against it, loss has to be faced.

BIONIC TURTLE

Describe various hedge fund strategies: Emerging Markets, Global Macro, and Managed Futures. Identify the risks faced by hedge funds.

- **Emerging market strategies** engage in investments in developing countries. In case of ***equities***, managers invest in securities trading on the local exchange, or securities like American Depository Receipts (ADRs). In case of ***debt***, hedge funds invest in either Eurobonds or local currency bonds. The price discrepancies between ADRs and the underlying shares may give rise to arbitrage opportunities.

- **Global macro strategies** carry out trades that reflect global macroeconomic trends. Hedge fund managers spot situations where markets have moved away from equilibrium and place large bets that they will move back into equilibrium. The main risk is that they may be unaware of when equilibrium will be restored because world markets can be in disequilibrium for long periods of time.

- **Managed futures strategies** try to predict future movements in commodity prices based on manager's judgment or trading rules generated by computer programs. Managers may use **technical analysis** which analyzes past price patterns to predict the future; or **fundamental analysis** which involves calculating a fair value for the commodity from fundamental factors. The risks include the problems of data mining.

BIONIC TURTLE

Describe hedge fund performance and explain the effect of measurement biases on performance measurement.

The Credit Suisse hedge fund index is an asset-weighted index of hedge fund returns after fees. It has some potential biases due to unavailability of complete information on all hedge fund returns. The table below compares the returns given by this index with the returns of S&P 500.

- Although hedge funds performed very well before 2008, in the same year they lost money on average. But they showed better performance than the S&P 500. From 2009 to 2013, the S&P 500 showed a higher return than the average hedge fund.

Table: Performance of Hedge funds

Year	Return on Hedge Fund Index (%)	S&P 500 Return including dividends (%)
2008	−15.66	−37.00
2009	18.57	26.46
2010	10.95	15.06
2011	−2.52	2.11
2012	7.67	16.00
2013	9.73	32.39

BIONIC TURTLE

Describe hedge fund performance and explain the effect of measurement biases on performance measurement (continued)

Some hedge funds report good returns for a few years and then perform poorly all of a sudden only to close their business eventually. There is a general view that hedge fund returns are like the returns from writing out-of-the-money options: the options cost nothing, but occasionally they become very expensive.

The **Tass hedge funds database** includes only hedge funds that report voluntarily.

- Small hedge funds and those with poor track records do not report their returns and are therefore not included in the data set.
- When returns are reported by a hedge fund, the database is backfilled with the fund's previous returns. This creates a bias in the returns that are in the data set because only the hedge funds that do well are the ones that disclose their return data. When this bias is removed, it is observed that hedge fund returns are no different from mutual fund returns, especially when their fees are taken into account.

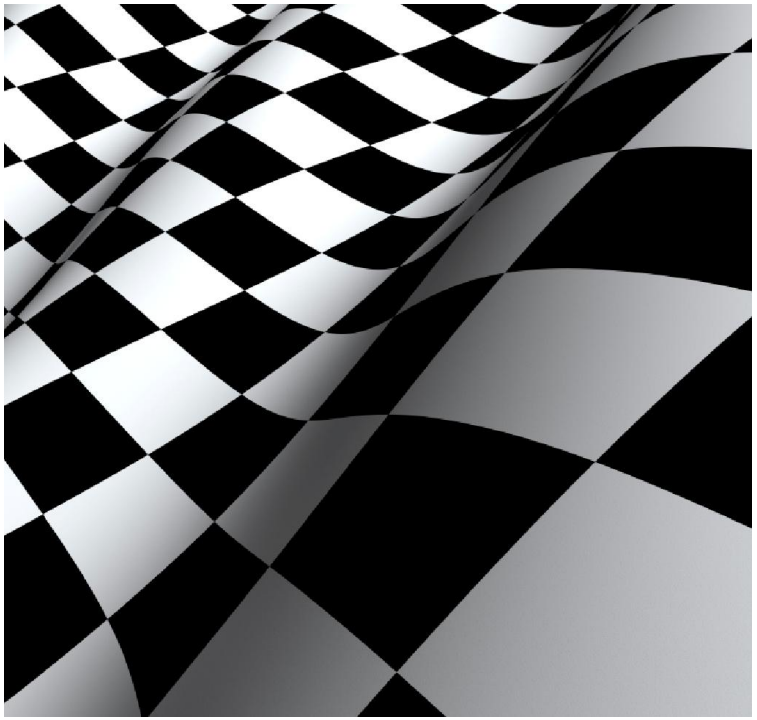
BIONIC TURTLE

The End

P1.T3. Financial Markets & Products

Hull, Risk Management and Financial Institutions

Mutual Funds and Hedge Funds



BIONIC TURTLE