

An introduction to the Hedge Fund industry



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Background and Definition : Introduction

- Hedge funds are alternative investments using pooled funds that may use a number of different strategies in order to earn active return, or alpha, for their investors. Hedge funds may be aggressively managed or make use of derivatives and leverage in both domestic and international markets with the goal of generating high returns (either in an absolute sense or over a specified market benchmark). Because **hedge funds may have low correlations with a traditional portfolio of stocks and bonds**, allocating an exposure to hedge funds can be a good diversifier
- Legally, hedge funds are most often set up as private investment limited partnerships that are open to a limited number of accredited investors (investors that earn a minimum amount of money annually and have a net worth of more than \$1 million, and that have a significant amount of investment knowledge) and require **a large initial minimum investment. Investment in hedge funds are generally illiquid as they often require investors keep their money in the fund for at least one year, a time known as the lock-up period.**
- Think of hedge funds as mutual funds for the very wealthy investors and the institutional ones. Hedge funds have far more flexibility than mutual funds in their investment strategies (in particular the use of short sales, leverage and other derivatives for hedging and speculating purposes) **(hedge funds vs mutual funds)**
- It is important to note that “hedging” is actually the practice of attempting to reduce risk, but the goal of most hedge funds is to maximize return on investment. They thus carry more risk than the overall market. **Hedge fund managers are compensated in two ways: a fee for assets under management (AUM) and an incentive fee, which is a percentage of any profits. A typical fee structure may be 2 and 20.**
- **A fund of funds (FOF)** is a fund that invests in a number of underlying hedge funds. A typical FOF invests in 10-30 hedge funds. Although FOF can achieve diversification, they have to pay two layers of fees: one to the hedge fund manager and the other to the manager of the FOF. FOF are typically more accessible to individual investors and are more liquid.

Background and Definition : Introduction

- History: the first Hedge Fund appeared in the 1930s, created by Alfred Winslow Jones who developed technical methods of market analysis, trends and market forecasting.
- His strategy consisted in combining long positions in undervalued stocks and short positions in overvalued ones. He was using leverage by using the proceeds of his short sales to finance the purchase of additional long positions.
- He structured his fund as a general partnership to avoid the restrictive Securities and Exchange Commissions (SEC) regulation: The first Hedge Fund was born
- From 1960 to 1965, Jones' partnership returned 325% while the Fidelity mutual fund returned 225%
- Interest in hedge funds and their investment approach started to soar
- Many of the stars of the hedge fund industry including Warren Buffett and George Soros started their fund during that period
- **As an illustration, a 100 USD investment in Buffett Partnership in 1956 would be worth in 2005 a staggering \$2.1 million after all fees and expenses (21.5% average annual gain from 1965 to 2005, with value investing approach).**

Background and Definition : Introduction

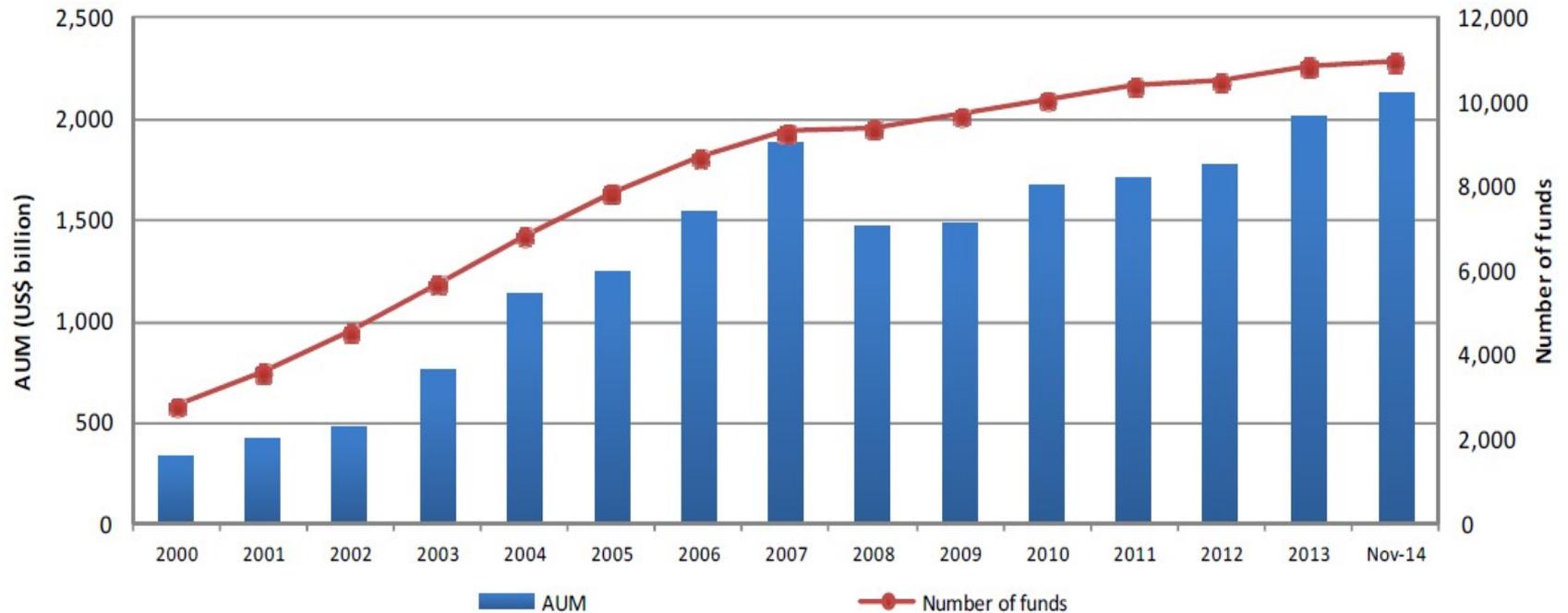
- Macroeconomic environment of 1980s (US dollar weakening, gold and commodity prices taking off, interest rates rising above the 10% level, bond markets falling and equity markets bullish) was particularly favorable to the **global macro strategy**
 - *Ex: George Soros' quantum fund made a billion USD gain in 1992 in one day when he forced the British pound to exit from the European Monetary System by selling short 10 billion \$ worth of pounds*
- Hedge Funds are often blamed for their destabilizing actions during crisis and are often found to be at the heart of events that can trigger a crisis (Ex: Asian crisis of 1997, Sub-prime crisis of 2008)
- Case of **LTCM (Long-Term Capital Management)** in 1998 represent a turning point in the history of Hedge Funds: excessive use of leverage and overconfidence of their models – they turned \$4 billion equity capital into \$100 billion of assets, which were then used as collateral for more than a trillion dollars of notional in OTC derivatives
- At the heart of every crisis: **overvaluation (bubble), overleverage, overconfidence and liquidity events**
- Hedge Funds today:
 - **Phenomenal growth** fuelled by the ability of hedge funds to outperform traditional markets during bear periods
 - But also by the increased interest from institutional investors (pension funds and endowments) as well as by the **record number of new hedge fund managers entering the industry**
 - After the financial crisis of 2007-2008, there has been some consolidation in the Industry:
 - **Barriers to entry** have heightened (from an operational and legal perspective)
 - AIFMD and Dodd-Frank introduced new regulatory oversight to an industry that was close to non-regulated

Background and Definition : Introduction

- **Average HF size:** \$87 million
- **Median HF size:** \$22 million
- **The five largest HF in the USA** have more than \$76 billion of assets under management
 - Long track records
 - Better organized
 - Multiple managers and decision makers
 - Improved risk management systems
- US managers control almost three-quarters of the global assets of the hedge fund industry. However, Europe is now at the leading edge of the industry's growth
- Most **European-based HF' assets** are managed or advised from the UK, the vast majority from London
- Asian investors are also frustrated by low yields and volatile stock markets, and they are now turning to HF to stabilize their portfolios.
- The market remains biased towards UK and US based fund managers, but a large number of **Asian-based hedge funds** have been created. Furthermore, it is now easier to start a HF in Asia than in Europe as there are less regulatory constraints. Most Asian funds are based in Hong-Kong, Singapore, Sydney and Tokyo. On average they are young and small (70% of them having less than \$50 million).

Background and Definition : Industry Landscape

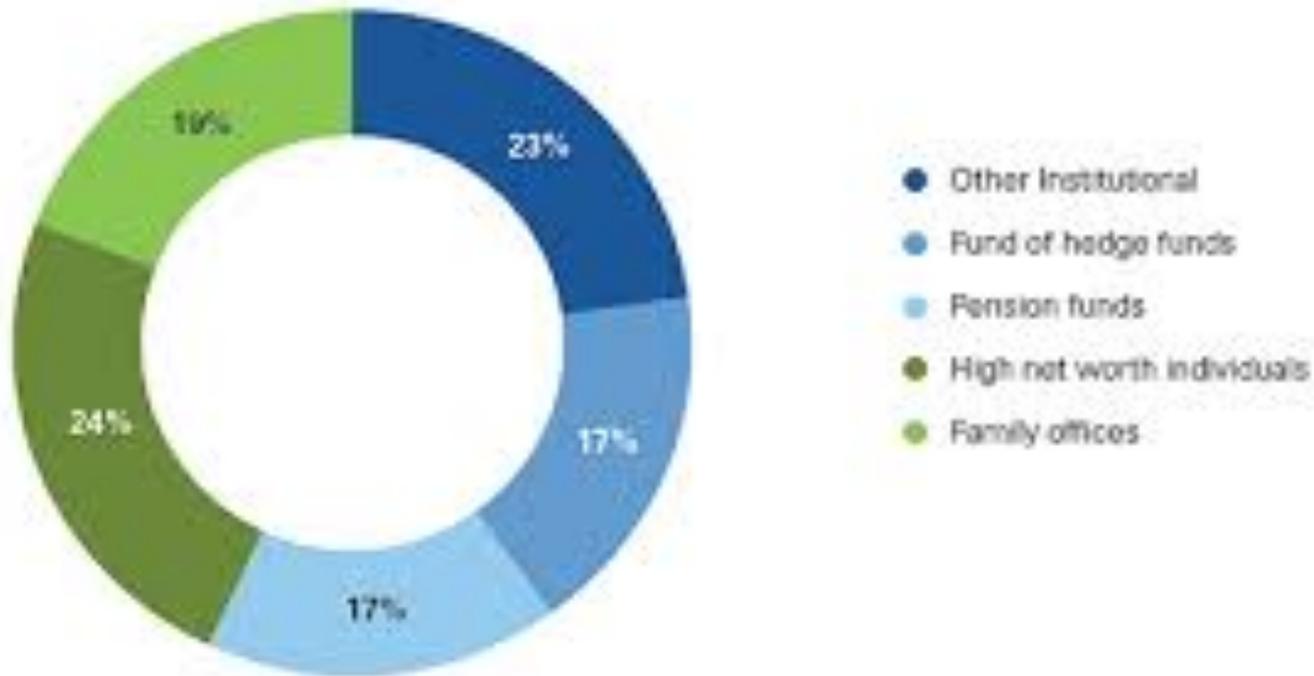
Figure 2a: Industry growth over the years



Source: EurekaHedge

Background and Definition : Industry Landscape

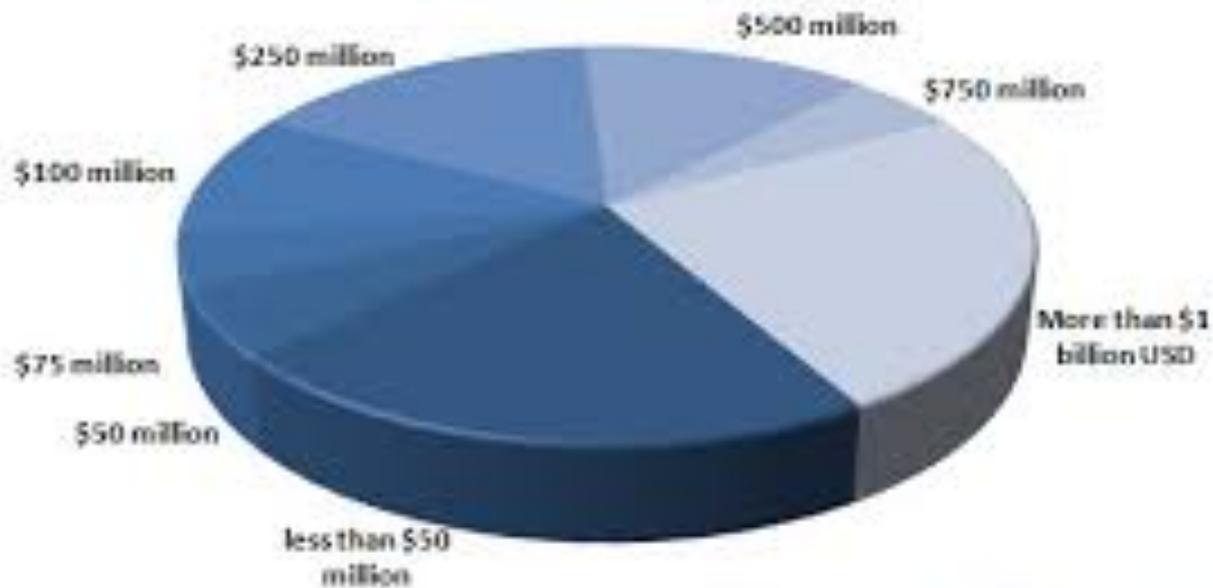
Global hedge fund AUM by investor type



Source: KPMG International, 2012.

Background and Definition : Industry Landscape

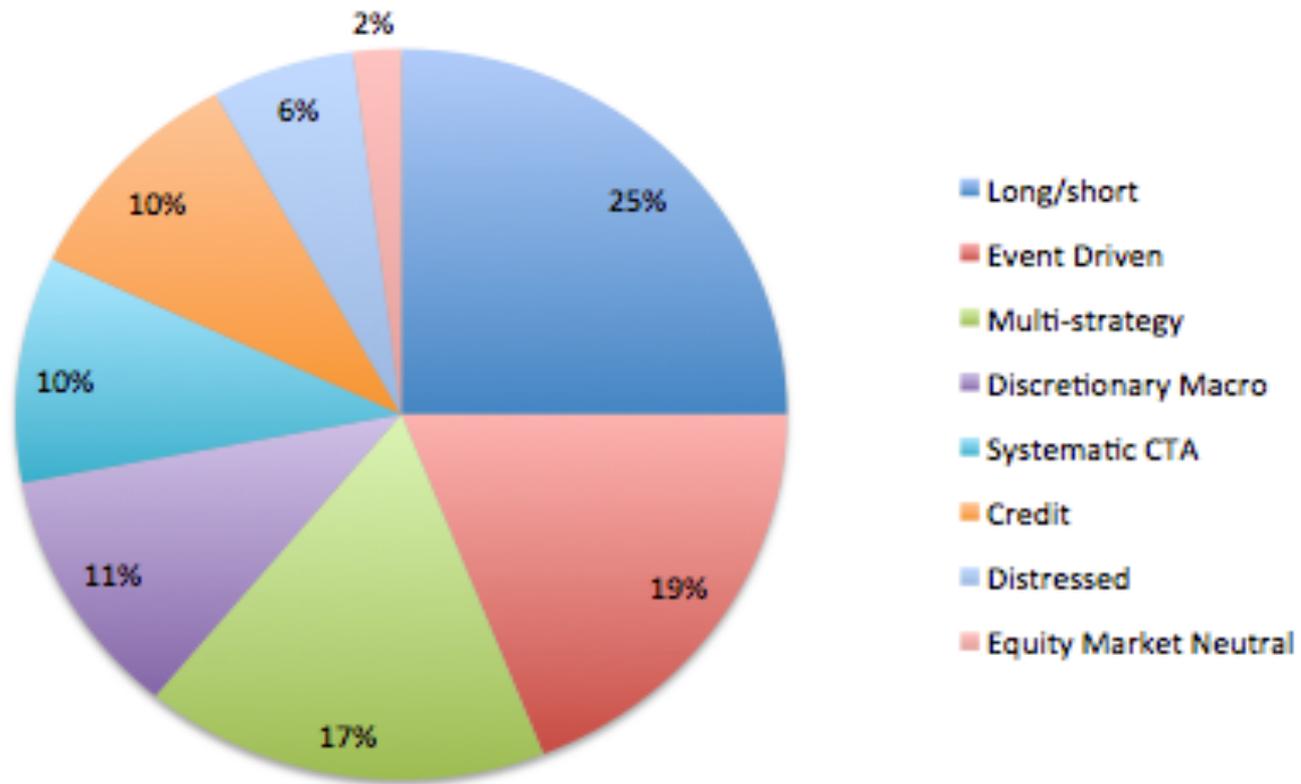
Size of Fund



source: HedgeFundCompensationReport.com

Background and Definition : Industry Landscape

Percentage Of Hedge Fund Assets By Strategy



Background and Definition : Industry Landscape

WORLD'S LARGEST HEDGE-FUND FIRMS

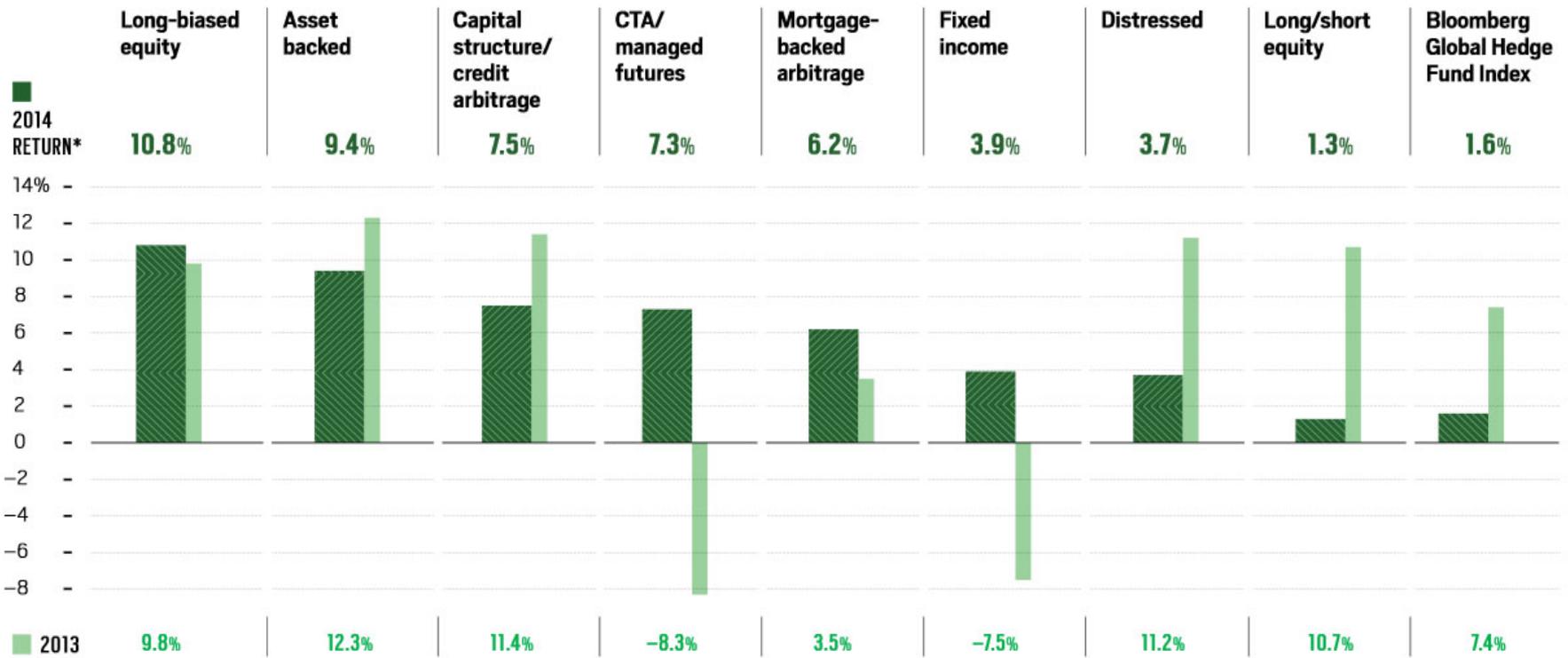
Firm, Location	HEDGE-FUND ASSETS UNDER MANAGEMENT, IN BILLIONS
1 Bridgewater Associates, <i>Westport, Connecticut</i>	\$88.9
2 JPMorgan Asset Mgmt., <i>New York</i>	62.9
3 Och-Ziff Capital Mgmt., <i>New York</i>	47.1
4 Man Group, <i>London</i>	40.9
5 Brevan Howard Asset Mgmt., <i>London</i>	37.0
6 AQR Capital Mgmt., <i>Greenwich, Connecticut</i>	35.1
7 D. E. Shaw & Co., <i>New York</i>	34.0
8 BlackRock Advisors, <i>New York</i>	32.8
9 Baupost Group, <i>Boston</i>	28.8
10 Winton Capital Mgmt., <i>London</i>	28.0

Figures are the latest available.

Sources: Bloomberg, hedge-fund databases, investors

Background and Definition : Industry Landscape

BEST-PERFORMING STRATEGIES



*As of Oct. 31. Source: Bloomberg

Background and Definition : Industry Landscape

WORLD'S MOST-PROFITABLE HEDGE FUNDS

	Fund, Manager(s)	Management Firm, Location	PROFIT, IN MILLIONS*
1	Viking Global Equities , <i>Team managed</i>	Viking Global Investors, U.S.	\$573.3
2	Millennium International , <i>Israel Englander</i>	Millennium Mgmt., U.S.	389.5
3	Citadel Wellington , <i>Team managed</i>	Citadel Advisors, U.S.	376.1
4	Pershing Square International , <i>Bill Ackman</i>	Pershing Square Capital Mgmt., U.S.	362.3
5	D. E. Shaw Composite , <i>Team managed</i>	D. E. Shaw Group, U.S.	248.4
6	Tiger Global , <i>Feroz Dewan</i>	Tiger Global Mgmt., U.S.	240.8
7	BZC Investment Partners , <i>Denys Grossmann</i>	BlueZone Capital Mgmt., Bahamas	201.1
8	Glenview Capital Partners , <i>Larry Robbins</i>	Glenview Capital Mgmt., U.S.	192.3
9	The Children's Investment , <i>Christopher Hahn</i>	The Children's Invst. Fund Mgmt., U.K.	180.3
10	Triam Partners , <i>Nelson Peltz, Peter May, Ed Garden</i>	Triam Fund Mgmt., U.S.	165.6
11	Winton Futures , <i>David Harding</i>	Winton Capital Mgmt., U.K.	161.1
12	Citadel Global Equities , <i>Team managed</i>	Citadel Advisors, U.S.	159.9
13	King Street Capital , <i>Francis Biondi, Brian Higgins</i>	King Street Capital Mgmt., U.S.	153.0
14	Elliott Associates , <i>Paul Singer, Jan Pollack</i>	Elliott Mgmt., U.S.	146.9
15	Stratus , <i>Team managed</i>	Capital Fund Mgmt., France	139.5
16	AHL Evolution , <i>Tim Wong, Matthew Sargaison</i>	AHL Partners, U.K.	133.4
17	Lansdowne Developed Markets , <i>Peter Davies, Stuart Roden</i>	Lansdowne Partners, U.K.	127.3
18	Goldman Sachs Invst. Partners Offshore , <i>Raanan Agus, Kenneth Eberts</i>	Goldman Sachs Asset Mgmt., U.S.	126.5
19	Dymon Asia Macro , <i>Danny Yang</i>	Dymon Asia Capital, Singapore	124.0
20	Two Sigma Spectrum Cayman , <i>Team managed</i>	Two Sigma Investments, U.S.	120.2

*Based on returns for the 10 months ended on Oct. 31.
Sources: Bloomberg, hedge-fund firms and databases, investors

Background and Definition : Positive indicators

- Goldman Sachs definition: “A multitude of skill-based investment strategies with a broad range of risk and return objectives. A common element is the use of investment and risk management skills to seek positive returns regardless of market direction”.
- Positive indicators of Hedge Fund activity:
 - Hedge Funds are actively managed: **systematic risk (beta and risk premium), specific risk (alpha)**
 - Competitive advantage of Hedge Funds in the active management world:
 - They collect information faster
 - They benefit from cheaper access to markets
 - They can afford to hire the best analysts
 - They enjoy superior trade execution and portfolio structuring
 - Hedge fund managers add value through active management and skill-based strategies, and should seek to reject traditional investment paradigms such as **the efficient market hypothesis** (hedge fund managers believe that markets do not price all assets correctly and strive to exploit those price inefficiencies).
 - Hedge funds are securitized trading floors: the best traders leave investment banks to start their own hedge funds and shrinkage in proprietary trading activities coincided with the development of hedge fund activity.
 - Hedge Funds have flexible investment possibilities: **long/short**, concentration rather than diversification, **leverage**, invest in **illiquid securities**, trade **derivatives** and **hold unlisted securities** , hedge against market declines, implement short sell, can switch easily strategies or markets if there are better opportunities. That is in sharp contrast with mutual funds which tend to have narrowly defined mandates due to industry and regulatory conventions (**benchmarking, non-benchmarking**).
 - Hedge funds use unusual legal structures to circumvent regulation
 - Hedge funds offer limited liquidity contrary to traditional investment funds but high liquidity comes at a cost. On the contrary hedge funds insist on a minimum investment period (terms of subscription, lock-up period, terms of redemption. Consequently, managers can concentrate their focus on investing rather than cash flow and liquidity management.

Background and Definition : Positive indicators

- Positive indicators of Hedge Fund activity:

- Hedge funds charge performance fees and target **absolute returns**: management fee, incentive fee, **hurdle rate**, **high-water mark** in the offering memorandum.
- The high-water mark states that any previous losses must be recouped by new profits before the incentive fee is to be paid.
- Clawback clause: the clawback clause stipulates that a portion of the incentive fee will be retained every year in a clawback account, usually until the account reaches a certain percentage of the assets. If future performance turns out to be negative, the clawback account is then debited to the client's credit at the incentive fee rate.
- Hedge fund managers pursue absolute return target, meaning that their goal is to be profitable regardless of the stock or bond market environment. In contrast, traditional asset managers care about their performance relative to a benchmark as well as the amount of assets they manage.
- Hedge fund managers are partners, not employees
- Hedge funds have limited transparency (a minimum level of transparency for effective due diligence is now usually provided).
- Hedge funds strategies are not scalable as they depend on manager skills and available investment opportunities. Hedge funds thus have a limited ability to absorb large sums of money, and a manager may prefer to close his fund to new subscriptions once it has reached a target size
- Hedge funds target specific investors although retail investors can now have access to hedge funds through funds of hedge funds. For single-name hedge funds, regulatory reasons require that only "sophisticated" investors may gain access to hedge funds.

Why Hedge funds?

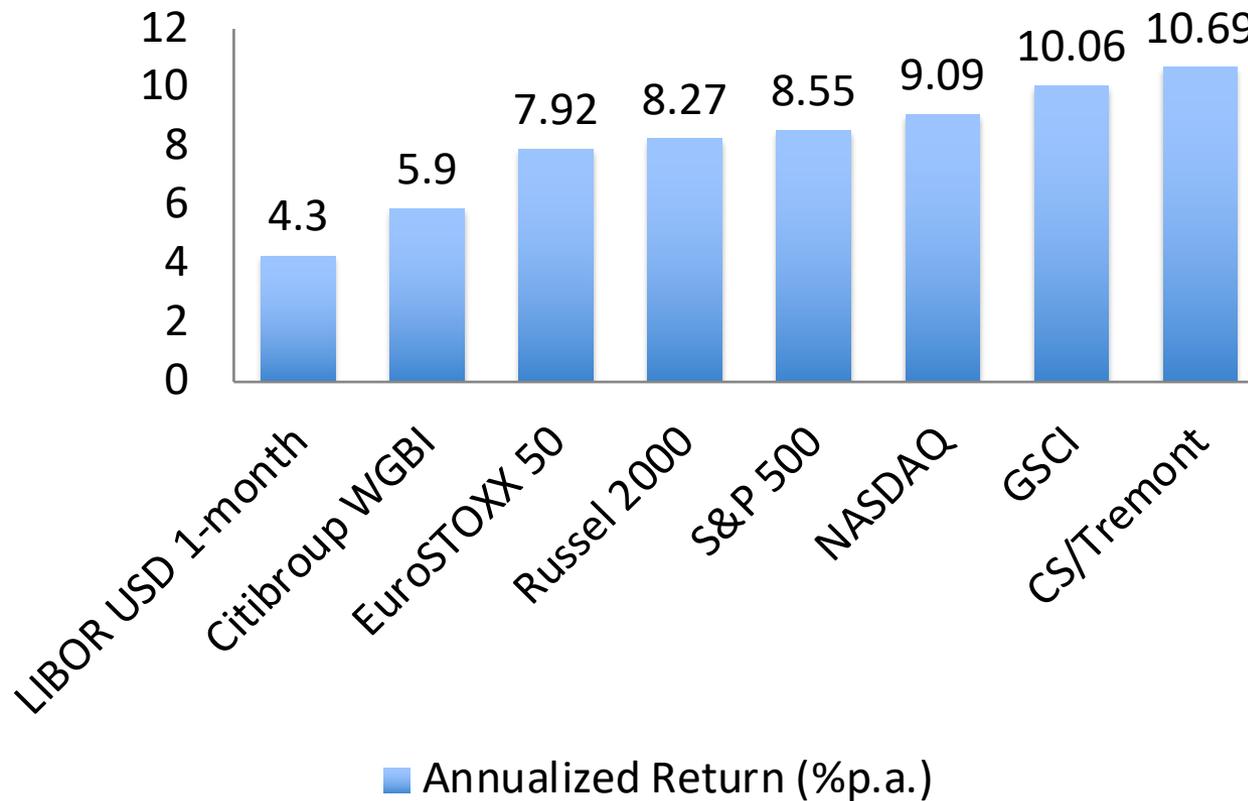
- Hedge Fund is part of the wider universe of alternative investment management
 - Broad scope and and series of assets and investment strategies
 - Benchmarking vs non-benchmarking (alpha generation)
 - Alternative investments: Private Equity, Venture Capital, commodities, precious metals, art, forestry, hedge funds (**find a graph as a pie with typical breakdown of a portfolio across those various asset classes**)
 - Characteristics: alternative (outside traditional investment philosophy), attractive returns with significant level of risk, de-correlation from mainstream markets
 - Complex reality: not a homogeneous asset class. There are now more than 8000 hedge funds in the world covering a wide range of strategies (in comparison, in 1990, there were 600 Hedge Funds worldwide managing less than \$40 billion of assets)
 - **In Europe, AuM by Hedge Funds total 549 billion USD, for a total of 2.4 trillion USD in the Industry**
 - **Hedge funds represent 1.15% of all assets under management worldwide.**
 - It is now a global business at the forefront of investment innovation
 - Investors: HNWIs and institutional investors looking for diversification benefits (pension funds, endowments)
- Advantages:
 - “Major contributors to the flexibility of the financial system” (Alan Greenspan, ex-Fed Chairman)
 - Critical source of liquidity for the markets:
 - HF are estimated to account for 25 to 30% of daily trading volume in large markets such as the NYSE
 - In some specialized markets, such as distressed securities or convertible bonds, HF control the market and represent most of the daily trading volume
- Perception:
 - Secretive industry
 - Perceived as excessively leverage high-risk/high-return vehicles managed by sophisticated traders
 - Prospect of huge financial returns but also appear to have the ability to undermine central banks

Why Hedge funds?

- Compensation structure:
 - 2% annual management fee and a 20% profit sharing fee
 - Hurdle rate and high water mark
- Regulatory structure of a Hedge Fund
- Ecosystem:
 - Who are the service providers that keep a hedge fund functioning properly? (custodians, prime brokers, etc...)
- Hedge Fund strategies:
 - “Hedge fund investing is more than just going long and short”
- Key risk and return measurements used to evaluate hedge fund investments
- Portfolio allocation:
 - Diversification benefits, risk budgeting and portfolio alpha
- The efficient market hypothesis
- A diversified professional base:
 - Portfolio managers and traders:
 - Structure and optimize portfolios and make investment decisions
 - Research analysts
 - Analyze the markets, individual securities and make recommendations to the portfolio managers
 - Quantitative analysts and developers
 - Develop financial models and are responsible for risk management, pricing models and hedging strategies
 - Ex: Starting salaries: 50K£ + 50% bonus + benefits + yearly increase of 10%
 - Investor relations executives
 - Responsible for marketing the hedge fund to private and institutional investors and fund raising
 - Legal and accounting professionals
 - Operations professionals
 - Some hedge funds operate as a reduced versions of an investment bank by being active on the buy and sell-side

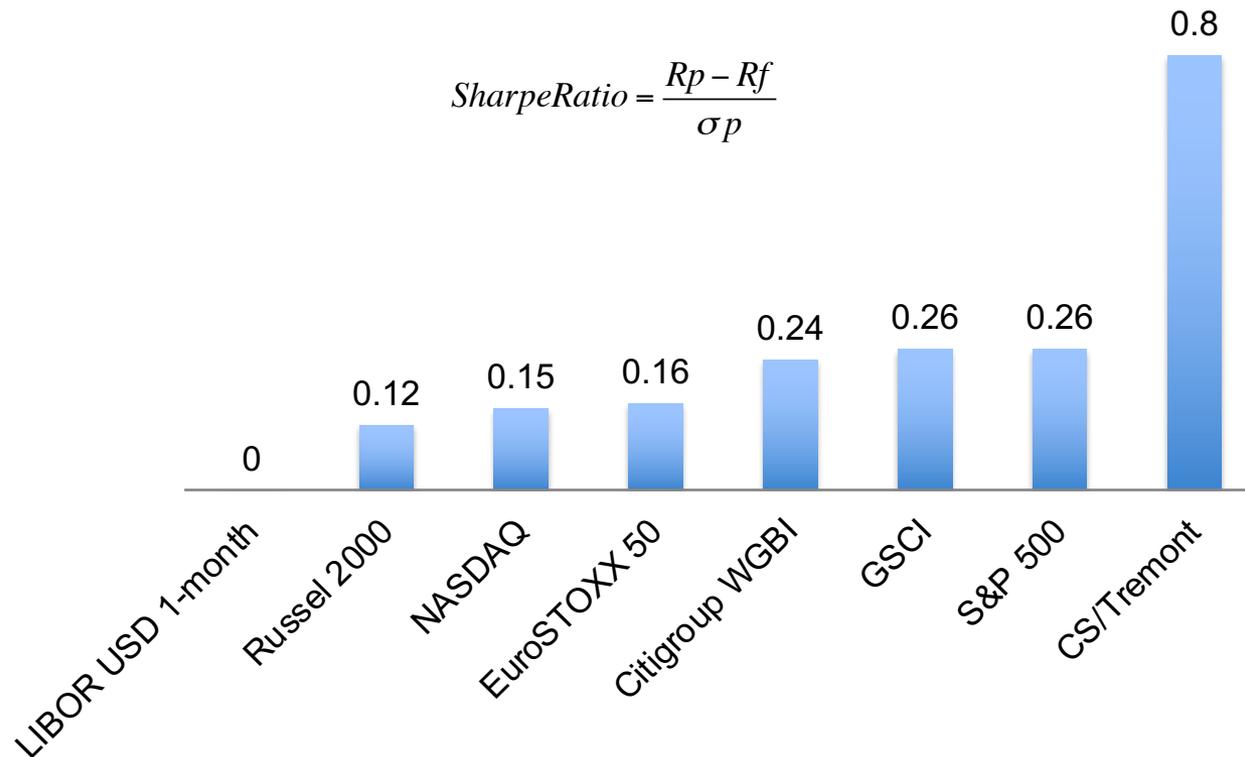
Why Hedge funds?

- Superior historical risk/reward trade-off: in the long-run they deliver returns that are better than those of bonds and equities (best talents / hedge funds don't face investment restrictions..). The annualized volatility (7.96%) represents about half of the S&P 500 volatility (16.16%) and roughly one fourth of the NASDAQ volatility (31.90%)



The benefits of the Hedge funds

- Better returns and less risk should result in higher risk-adjusted performance. This is indeed the case when looking at Sharpe Ratios (risk-adjusted measure of return), which constitutes the major motive for hedge fund investing. Rather than accepting the conventional wisdom that investors need to take greater risk in order to achieve greater returns, why not achieve greater returns while taking less risk by investing in a diversified portfolio of hedge funds?
 - Sharpe Ratio:
 - The Sharpe Ratio measures the amount of “excess return per unit of volatility”. It is calculated by dividing the excess return of the fund by its volatility (R_f is the risk-free rate): the higher the ratio, the better.



The benefits of the Hedge funds

- **Low correlation to traditional assets:**
 - Hedge Funds tend to have a low to medium correlation with traditional asset class returns. This is a clear sign that hedge funds can provide opportunities for diversification of traditional portfolios.
- Negative vs positive market environments
- Caveats of hedge fund investing:
 - Very few hedge funds have more than 10 years of existence
 - CS/Tremont represents a large diversified portfolio of hedge funds. Investors will generally hold a smaller portfolio of hedge funds than the hedge fund index. In practice, the superiority of hedge fund investments over traditional assets relies heavily on the ability of the investor or its adviser to select the right hedge fund managers.
 - Many funds (and some of the best performing ones) are closed to new investors and impose long lock-up periods. It is thus often difficult for investors to gain exposure to certain hedge fund strategies.
- **Conclusion:** Hedge fund investing offers several benefits, but it should not be considered as a “free lunch”. It has its risks and challenges. Most investors do not consider hedge funds as stand-alone assets but combine several different alternative strategies that, in aggregate, produce a desired return pattern.

Legal environment

- Hedge funds operate in regulated markets, utilize the infrastructure of regulated financial centers and deal with regulated financial institutions (e.g. brokers and banks) to implement their investment strategies. It has come from a close to none regulated industry to a regulated industry through Dodd-Frank and AIFMD.
- Hedge funds tended to structure themselves in such a way as to avoid direct regulation oversight and escape the registration or licensing requirements generally applicable to investment companies.
- Hedge funds want to operate with maximum flexibility, which is precisely what regulators do not want traditional retail funds to do.
- **Hedge funds were often registered in offshore jurisdictions and regulators had no extraterritorial powers to control them.**
- Most of the complexities of hedge fund structures result from the desire to benefit from regulatory exemptions and/or to cater the needs of specific taxable or non-taxable investors.
- Notion of accredited investors: offerings of hedge funds cannot be publicized by general soliciting or advertising and target sophisticated investors (institutional investors and HNWIs).
- Most hedge funds restrict their focus to accredited investors, otherwise they would need to prepare a detailed and comprehensive private placement memorandum.

- Fines have been levied on Hedge Funds and hedge fund managers for fraud, misrepresentation, insider trading, market manipulation and other fraudulent practices:

- Rajat Gupta, former McKinsey Managing Director, was sentenced to two years in jail and a fine of \$5 m for insider trading in 2012 as he had leaked confidential information about a \$5 billion investment in Goldman Sachs shares by Warren Buffett, tipping off his friend at Galeon Hedge Fund.
- **Create a table in two columns, each row corresponding to the bullet point, on the first column, name the paragraph (ex: first paragraph would be “HF Regulation”, and on the right, the text.**

Operational and organizational structure

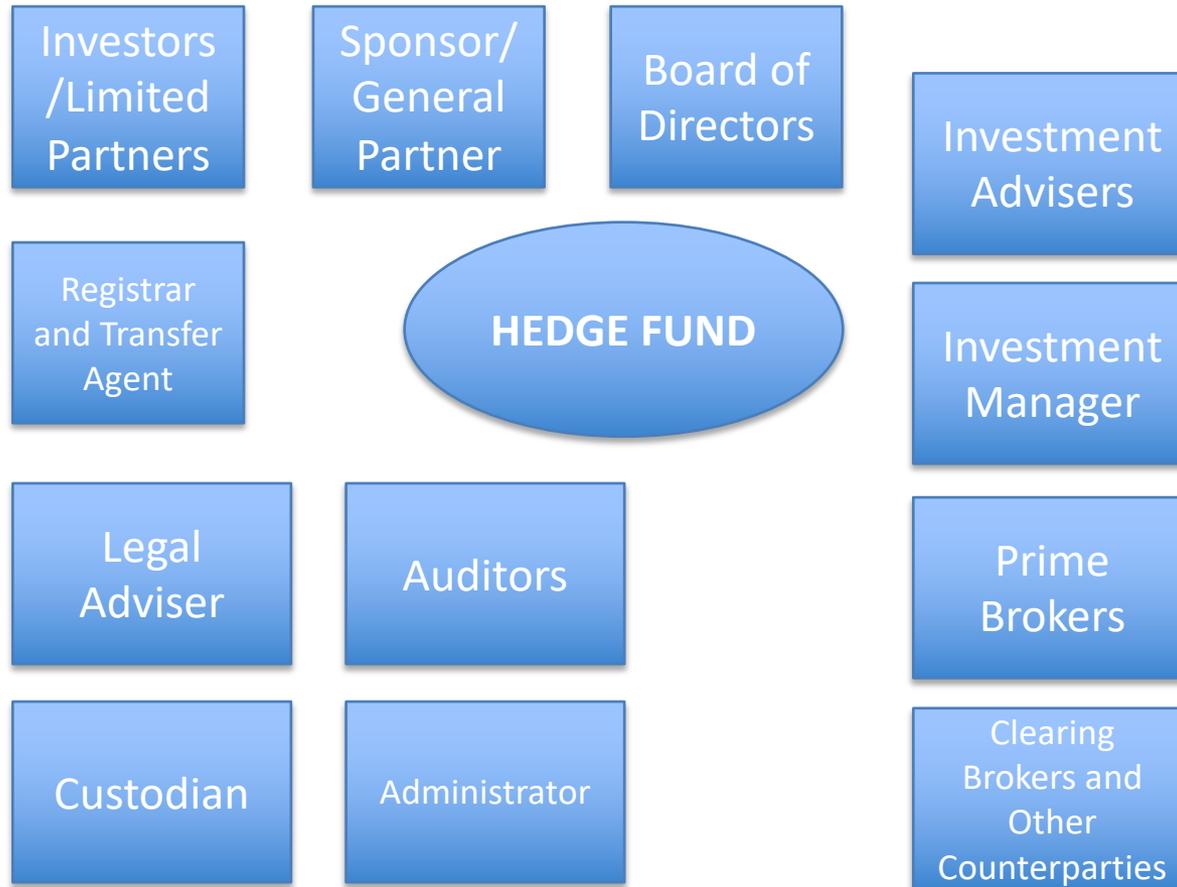
- From a functional perspective, hedge funds are very similar to traditional investment companies. Both are **separate collective investment schemes** that issue shares to investors and manage pools of securities on their behalf. The primary differences are to be found on the organizational and legal sides. Mutual funds tend to be simple onshore organizations, while hedge funds need to be set up using complex onshore and offshore structures.
- The legal structure of the hedge fund depends on who its investors will be and where the fund will be registered (onshore vs offshore).
- Onshore: anything that is located in the US; offshore: anything outside the US
- Limited partnership and limited liability company
 - A **limited partnership** has one or more general partners and raises money from investors who become limited partners.
 - A **limited liability company** is a business entity with some characteristics that resemble a corporation and other characteristics that resemble a partnership: members.
 - The limited partnership has historically been the preferred structure in the US for domestic funds, because it can easily accommodate investors subject to US income taxation and avoid the problems linked to a public offering of securities.
- Hedge funds domiciled outside the US are generally structured as offshore open-ended companies (generally registered in Cayman Islands, BVI, Bahamas, Bermuda, Netherlands Antilles). Ireland may be used for funds targeting Europe. Mauritius, Hong Kong and Singapore are the favorite offshore centers for Far East investing.

Operational and organizational structure

- The choice of a particular place of incorporation is extremely important for a hedge fund:
 - Tax-favorable nature of the jurisdiction (profits, capital gains, distributions, withholding taxes, etc..)
 - Most offshore hedge funds operate tax free
 - Public image of the country
 - Availability of competent local service providers, such as banks, lawyers, accountants, administrators and staff
 - Various types of investment vehicles available
 - Operating costs
 - Convenience of location
 - Local regulations (most non-US investors do not want any information about them reported to the US tax authorities but this is changing with new regulations such as FATCA)
- Most offshore funds maintain their custody and administration in the offshore country, while the hedge fund adviser is located elsewhere, e.g. in the United States or Europe
- For tax reasons, most US investors choose to stay away from offshore hedge funds

Operational and organizational structure

A network of service providers:



Operational and organizational structure

- Sponsor: it is usually the creator of the hedge fund (general partner if the fund is structured as a limited partnership)
- Investors contribute capital and receive some form of ownership – in companies they hold share, in a limited partnership, they are the limited partners and have a capital account. Most of the time, the sponsor will also be an investor
- Board of directors: they oversee the way the fund operates and ensure that corporate policies are followed
- Investment adviser: closely related to the sponsor. His role is to organize the hedge fund and run it. The adviser is also often in charge of marketing and distributing the fund's shares to investors, as well as providing periodic reports to investors about the fund's performance. Registration with the SEC is mandatory since 2006
- The investment manager: his primary responsibility is to manage the portfolio of the fund from an operational perspective and implement the recommendations of the investment adviser. In the case of an offshore fund, the investment manager is usually structured as a company that belongs to or is affiliated to the fund sponsor. In the case of offshore funds, a single entity may act as both sponsor and investment manager.

Operational and organizational structure

- **The broker: the hedge fund places its orders with brokers.** Now we talk about prime brokers established by investment banks.
- **Prime brokers** should be seen as full service providers across the core functions of execution and operations: **(could we organise the information below in a table?)**
 - Clearing and settlement: trade allocation, confirmation and settlement are consolidated with the prime broker
 - Acting as global custodian (consolidated reporting of trades, positions and performance)
 - Margin financing: allowing hedge funds to use leverage to implement their investment strategy (credit, loans, repurchase transactions)
 - Securities lending: giving the hedge fund the ability to take short positions
 - Risk reporting: as collateralized lenders, prime brokers need to have robust risk monitoring systems in place to protect them
 - Research: access to their own research but also to third party research to complement the hedge funds' own research
 - Collateral management: most prime brokers offer cross-margining facilities (positions that need collateral are grouped and margined together)
 - Capital introduction: prime brokers regularly arrange for hedge fund managers to speak at various conferences they arrange, where high net worth clients of the prime brokers are likely to be in attendance
 - Valuation: source of pricing for certain types of securities
 - Remark: the prime brokerage relationship still allows hedge funds to maintain relationships and execute trades with multiple brokers
 - Today the business of prime brokerage is concentrated in the hands of a few investment banks

Operational and organizational structure

- Prime brokers could be seen sometimes as hedge fund incubators and hedge funds can have relationships with more than one primebroker simultaneously to reduce counterparty risk.
- **The fund administrator:** valuation, independent pricing and net asset value (NAV) calculation. Today the primary role of a hedge fund administrator is to provide back-office support by taking responsibility for the operations, administrative, accounting and valuation services, thereby allowing the fund manager to concentrate on investing.
 - NAV calculation is of paramount importance for a hedge fund and its investors, since its result will be used as the basis for all subscriptions, redemptions, and performance calculations.
 - Importance of having the fund valuation performed independently from those in charge with managing the fund. People such as traders or portfolio managers should never perform final valuations, or communicate prices to the administrator.
 - Example of Capco study that investigated 100 hedge fund failures over the last 20 years: **more than half were caused by operational problems rather than poor investment decisions. (can you do a graph illustrating this?)** Valuation problems were an obvious concern (and were caused by either, fraud/misrepresentation, mistakes or process, systems or procedural problems particularly for OTC instruments that cannot be handled by automated processing systems. Regulatory reporting is often outsourced to the fund administrator (AIFMD).

Operational and organizational structure

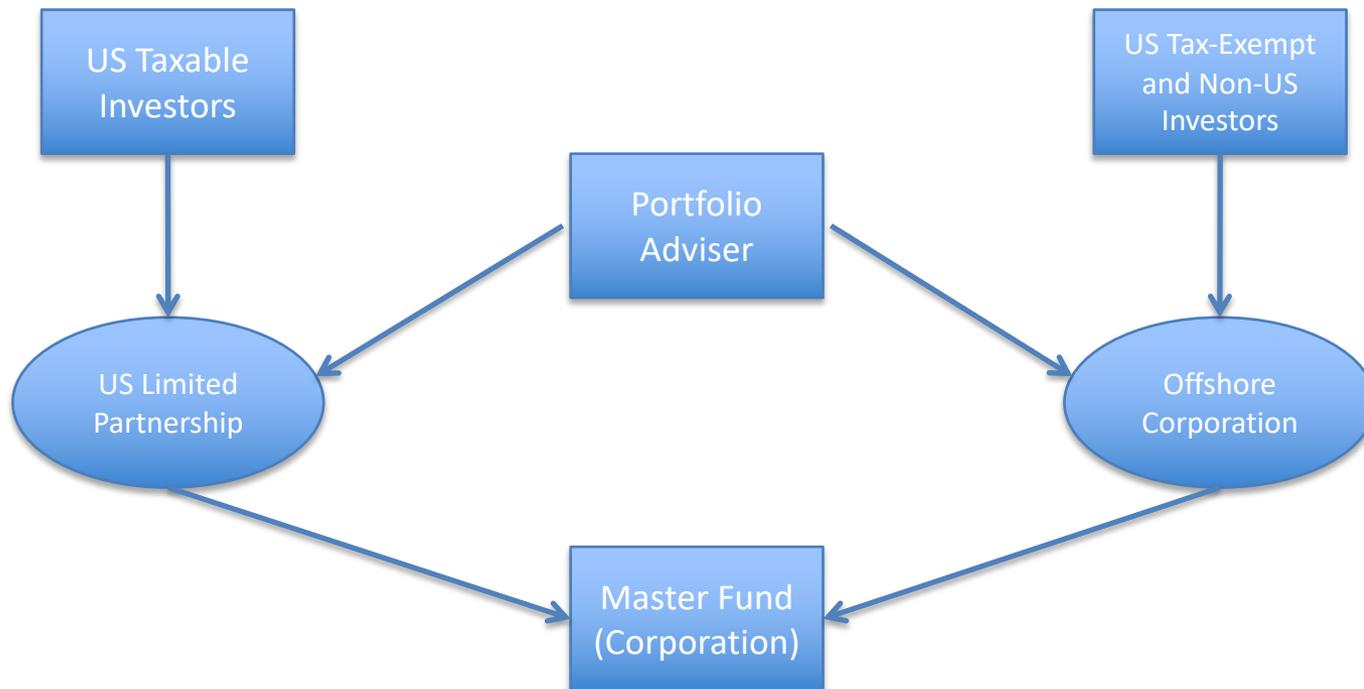
- **The custodian/trustee:** requirement to take into custody the assets of the investment fund on behalf of the fund. The custodian is also in charge of providing payment when securities are bought and receiving payment when securities are sold. Lastly, the custodian is also responsible for providing periodic reports on the transactions within the account.
- **The legal counsel:** assists the hedge fund with any tax code and/or legal matters and ensures compliance with domestic investment regulations as well as with regulations of countries where the fund is domiciled or distributed. A legal counsel should be appointed where the fund is domiciled and where the hedge fund manager is located and operates.
- **The auditors:** its role is to ensure that the hedge fund is compliant with accounting practices.
- **The registrar and transfer agent:** it retains and updates a register of shareholders of the hedge fund.

Operational and organizational structure

- **The distributors:** independent third party introducers. Some hedge funds do not use distributors and handle their distribution internally. They generally charge a front-end load that varies from 2 to 5% of the amount invested. If the introduction of client becomes a regular event, the distributor must be registered as a broker-dealer in the corresponding state.
- **The listing sponsor:** a listing on a recognized and regulated exchange can provide a valuable marketing tool for hedge fund and fund of hedge funds promoters. Several exchanges dedicated to hedge funds have been established, notably the Irish Stock exchange, the Channel Island Stock Exchange and the Bermuda Stock Exchange. These exchanges facilitate the marketing of the shares/units to specific categories of investors.

Specific investment structures

- **Master/Feeder structure:** two-tiered investment structure in which investors invest their capital in a “feeder” fund, which in turn invests in a “master” fund managed by the same investment adviser
- In such structure, all transactions are centralized and in one place and the critical mass of assets is increased. This allows for a reduction in the number of transactions and reduces the trading costs.
- The master fund can be located either offshore or onshore (the tax implications differ for each depending on the type of investor)



Specific investment structures

- **Managed Accounts:** managed accounts rather than fund shares to some of their clients, typically for accounts larger than \$100 million. A managed account can be seen as a segregated investment account in which the investor has direct ownership of the individual securities in the account.
- From an operational perspective, a managed account simply takes the form of an account opened by the client at a prime brokerage house or at a bank. The fund adviser receives a mandate to manage the account by giving orders to purchase and sell securities on behalf of the client, as if he was managing his own fund.
- The advantages for the investor are full transparency and high liquidity.
- **Managed account platforms:** offering the full range of middle- and back-office services as well as independent valuation and risk monitoring to fund managers that want to offer their clients managed accounts.

Specific investment structures

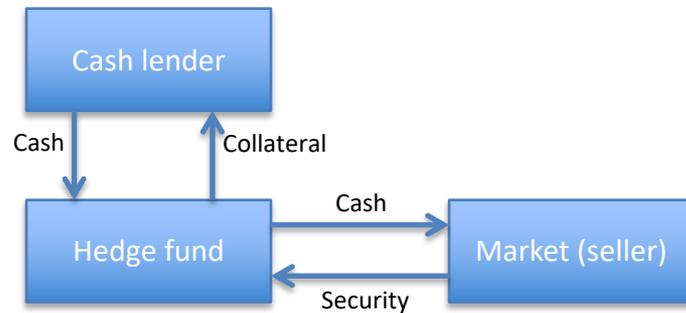
- Limitations: risk management and monitoring of security level positions remains a challenge.
- Generally managed accounts are used by new hedge fund managers.
- Managed accounts are the only practical solution for investors wishing to invest in hedge funds but requiring extreme liquidity conditions.
- Disclosure and documents:
 - PPM: Private placement Memorandum: key elements so that an investor can make an investment decision, it contains: executive summary, investment philosophy, biographies, terms and conditions (fees and expenses), investment track record and prior fund performance, legal and tax matters, investment risks, accounting and reporting standards, information concerning service providers

Tools used by Hedge Funds

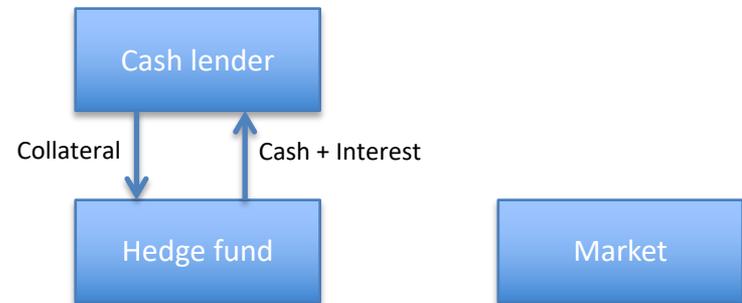
- Buying and selling using a cash account:
 - Buying long: most common strategy. A hedge fund buying long has some cash and simply exchanges it for the security it wants to hold
 - Selling is the opposite of buying long.
 - These are called cash transactions because they do not involve any loan and do not require any collateral.
- In contrast, other transactions are based on some form of lending and therefore require the posting of collateral and repayment of the loan. In this case, a brokerage firm will lend some securities or some cash and will hold other assets in the fund's account as collateral for the loan (the collateral in this case is termed margin and can be made up of cash, securities or other financial assets): buying on margin and selling short. Margin transactions involve a third party: the security lender. This is because buying on margin and selling short imply borrowing an asset. When buying on margin, the hedge fund borrows cash; when selling short, the hedge fund borrows a security.

Tools used by Hedge Funds

Buying on margin:



Flows resulting from initiating a buy on margin transaction



Flows resulting from closing a buy on margin transaction

Tools used by Hedge Funds

- Reasons for a hedge fund to buy on margin:

- Efficient way of borrowing against the securities already held in a portfolio, using them as collateral. The proceeds of such a loan can be used for both investing and non-investing needs. It is a form of leverage.
- Since margin loans are always secured by collateral, the default risk of a borrower is relatively limited.

- Rules to prevent excessive use of credit to purchase securities:

- Minimum margins, initial margins and maintenance margins
- To open a margin account with a broker and before any trade takes place, an investor must deposit a minimum margin (minimum of \$25000 in cash or fully paid securities with the NYSE)
- Initial margin: minimum amount of funds an investor must put up to purchase securities on credit. Example: 50% initial margin: an investor willing to buy one share of common stock valued at \$100 per share must do so with at least \$50 of his own funds or additional collateral. The current rate set in 1974 is 50%. As a comparison, in the 1920s, the initial margin requirement was only 10% which resulted in high levels of margin debt and unstable stock prices, and created conditions for the stock market crash of 1929.

Tools used by Hedge Funds

- Rules to prevent excessive use of credit to purchase securities:

- Maintenance margin: it represents the minimum amount of funds an investor must have on his margin account to maintain an open position. It is expressed as a fixed percentage of the total market value of the securities held on margin (for instance, on the NYSE, a minimum of 25% maintenance margin is required). The positions purchased on margin are marked-to-market each day. If the value of the margin account falls below the maintenance margin, the hedge fund receives a margin call. This is basically a request to deposit additional collateral (most of the time security lenders use a haircut table). The cash transferred due to a margin call is referred to as the variation margin.
- Basic rule: “Equity = Assets – Liabilities” becomes “Equity = Market value of long stocks – Debit balance”
- Example: buying 10000 shares at \$10 each with a broker applying the 50% initial margin and the 25% maintenance margin requirement

Assets		Liabilities	
Long stocks	100000	Debit balance	50000
		Equity	50000

Tools used by Hedge Funds

- If the stock price goes up to \$12: then the fund's equity would cover 58.33% ($70000/120000$) of the market value of the stocks held long

Assets		Liabilities	
Long stocks	120000	Debit balance	50000
		Equity	70000

- If the stock price goes down, say to \$8: then the fund's equity would cover 37.5% ($30000/80000$) of the market value of the stocks held long, which is still above the minimum maintenance margin.

Assets		Liabilities	
Long stocks	80000	Debit balance	50000
		Equity	30000

Assets		Liabilities	
Long stocks	60000	Debit balance	50000
		Equity	10000

Tools used by Hedge Funds

- To trigger a margin call (request to increase the amount of equity), the value of the the hedge fund's equity needs to equal 25% (the maintenance margin) of the value of open positions. The corresponding threshold stock price can be calculated as:

$$\text{Equity} = (\text{Long stock value} - \text{Debit Balance}) = 0.25 \times \text{Long stock value}$$

- Let us say that the stock price falls to \$6 per share: in this case the equity covers only 16.6% of the value of the open position which is below the maintenance margin of 25%. A margin call is then triggered.

Assets		Liabilities	
Long stocks	60000	Debit balance	50000
		Equity	10000

Tools used by Hedge Funds

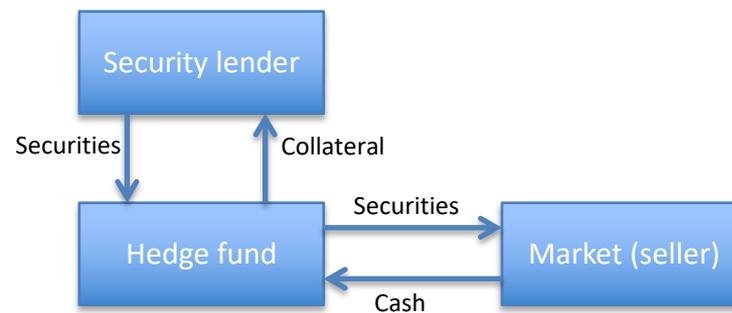
- Margin call: the fund decides to respond by depositing an additional amount of \$5000 in its margin account, the cash deposit will be applied against the debit balance. In this case, the equity finances exactly 25% of the long stock position (15000/60000)

Assets		Liabilities	
Long stocks	60000	Debit balance	45000
		Equity	15000

- Note that if the hedge fund manager ignores the margin call or is not reachable, the broker is entitled to protect his interests without prior notice and bring the equity coverage into an acceptable range by selling a portion of the long stock position. The fund manager has no right to control such liquidation decision.

Tools used by Hedge Funds

- **Short selling and securities lending:** Selling something that you do not own yet: a controversial activity in the financial markets as this seems to foster some sort of pessimistic view on market direction. However, short sellers provide markets with important benefits and short selling is now a key tool used by hedge funds.

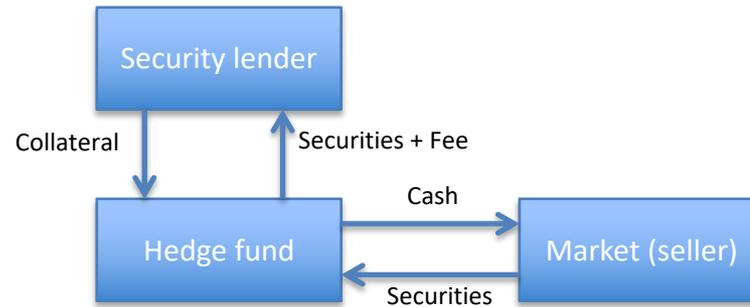


Flows resulting from initiating a short sale transaction

Tools used by Hedge Funds

- Short selling consists of a series of basic operations:
 - The hedge fund sells a given number of securities that it does not yet own. The buyer of the securities is not aware that this is a short sale.
 - The hedge fund borrows the same number of securities from a security lender and contracts to retransfer an equivalent number of the same securities at some point in the future to the lender. The security lender receives a daily fee from the hedge fund. In addition the hedge fund has to put up collateral to provide the lender with a perfected security interest until the securities are returned. This collateral can be either in cash or other acceptable securities.
 - The hedge fund delivers the securities to the buyer with full legal ownership, including voting rights.
 - At some later date, the hedge fund will repurchase the same number of securities from the market.
 - The purchased securities will be returned to the lender. The short position is then closed.

Tools used by Hedge Funds



Flows resulting from closing a short sale transaction

- As soon as the stock has already been borrowed or is known to be available at the time of the sale, the transaction is commonly called a covered short.
- If the seller does not yet own the stock he is selling and has made no provision to borrow or otherwise provide for delivery of stock to the purchaser by the settlement date by the settlement date, the transaction is referred to as a naked short.

Tools used by Hedge Funds

- **Short selling involves important risk:**

- **Market risk.** Short sellers must buy back an equivalent number of the same securities that were sold. They are exposed to the risk of the price of shorted securities rising rather than falling
- **Recall risk:** borrowed securities may be recalled at any time by the lender (short squeeze as the short seller would be forced to close his position and to repurchase the securities in the open market at any price).
- **Liquidity risk:** with less liquid securities, the market may dry out and the short seller may be unable to find securities to buy, making it difficult for him to close out his positions. (famous examples of short squeeze in history: the US railways and Vanderbilt)
- **The cost and difficulty of short selling** is determined by supply and demand in the securities lending market. It is relatively easy to borrow large cap stocks at a cost varying from 25 to 75 basis points per year. It is much harder to borrow securities that have low institutional ownership or that are in high demand for borrowing. This leads to a paradox: the securities lending market works well, except when everybody want to use it to sell short, as the cost of borrowing may increase dramatically and the recall risk may be high. This paradox explains why hedge fund managers do not want to disclose their short positions – the cost of borrowing securities rises when other investors are also trying to short.

Tools used by Hedge Funds

- **Reasons for short selling:**

- Profit from an overpriced security or market
- More sophisticated hedge fund strategies may use short selling as a hedge for other long positions with offsetting risk or as a way to speculate on spreads (the difference between two securities).
- Remark1: US market size of open securities loan positions is close to \$3 trillion. The primary source of securities lending remains portfolios of beneficial owners, such as institutional investors, pension funds and insurance companies. These investors are willing to generate additional revenue on their long-term strategic holdings and are motivated by the desire to reduce custody fees for their portfolios.
- Remark 2: Rules and regulations are set up to encourage individuals to buy stocks and not to sell them short.
- Remark 3: Short sale restrictions can reduce the severity of price declines. Many regulators have imposed a series of specific short sale constraints that mechanically impede short selling, or at least restrict it to some market participants and/or some liquid securities.
- Remark 4: The uptick rule means that the short sale can only take place at a price higher than the last previous transaction in that security. This rule is intended to prevent the short selling of a stock that is already declining in price in order to avoid sending stock prices into a free fall.
- **Could we organise this slide into a table?**

Tools used by Hedge Funds

- Benefits of short selling:

- Contributes positively to market efficiency by conveying into the market negative information about securities, facilitating price discovery and reducing the likelihood of overpricing of securities. Example: in 2000 the restricted availability of shares for borrowing inhibited short selling and contributed significantly to the dot-com bubble.
- Short selling constitutes the first line of defence against financial frauds and even unjustified bubbles.
- Short selling facilitates the implementation of arbitrage strategies.

- Alternative to short selling: **repurchase agreements (repos)**:

- They form the bulk of bond lending transactions.
- In a repo, one counterparty (the “seller”) agrees to sell securities to another (the “buyer”) for a fixed amount of cash, and simultaneously undertakes to repurchase the same security at a future date and at a fixed price. In a sense, the seller acts as a security lender (he owns the security and lends it as collateral to borrow cash).
- The lending fee is implicitly equal to the difference between the initial selling price and the agreed repurchase price – it is usually translated into an interest rate which is referred to as the repo rate for that security. The buyer acts as a security borrower – he has invested money at the repo rate, but obtained the security as collateral.
- Most of the time, the principal of the loan in a repo transaction is less than the full price of the collateral security in order to further protect against any potential losses due to counterparty default. The difference between the price of the collateral security and the loan amount in a repo is referred to as a haircut.
- The majority of repos are for overnight terms and the counterparties often choose to renew the repo by renegotiating the repo rate on a daily basis.

Tools used by Hedge Funds

- Derivatives:

- A derivatives derives its value from the value of another asset or quantity.
- Hedging instruments for risk transfer mechanisms among institutions
- Linked to the development of new, low-cost, risk-managing financial instruments that could be traded international financial markets in order to reduce the costs and risks associated with international borrowing and lending.
- **OTC derivatives versus exchange traded.**
 - OTC are negotiated between parties typically an end-user and an investment bank (customization). Important counterparty risk as OTC derivatives are usually not marked-to-market. However, this has changed with the new regulations (EMIR, MiFiD: OTC CCP)
 - Exchange-traded contracts are transacted through a regulated exchange. They are standardized and cannot be specially tailored to specific situations. However, contracts are market to market on a daily basis to minimize default risk.
- Basic derivatives contracts:
 - Forwards (OTC)
 - Futures (similar to forwards but exchange-traded)
 - Options (OTC and exchange-traded)
 - Call / Put
 - American vs European
 - Cash settlement as opposed to the delivery of the underlying asset
 - The greeks: delta, gamma, vega, theta, rho

Tools used by Hedge Funds

- **Derivatives:**

- Basic derivatives contracts:

- FRAs (forward rate agreements) (OTC, based on interest rate differentials)

- Swaps (OTC): ex: interest rate swap (floating vs fixed)

- Total return swaps: contracts that allow investors to receive all of the cash flow benefits of owning an asset without actually holding the physical asset.

- Credit derivatives: credit risk transfer mechanism without transfer of ownership. The most highly utilized credit derivative remains the CDS (credit default swap): most liquid and efficient way to hedge concentrations of single-name credit risk. It is similar to an insurance contract, providing the buyer with protection against the risk of default or significant credit deterioration of an asset issued by a specified issuer. A CDS is an OTC bilateral agreement between a protection buyer and a protection seller. The protection seller promises to compensate the protection buyer against an economic loss in a reference asset if a credit event occurs. In return, the protection buyer pays a fee, either upfront (for short-dated contracts) or on a regular basis (for long dated swaps).

- Typical credit events are bankruptcy, a failure to pay (the issuer fails to pay interest or principal payments when due), a debt restructuring...

- CDS can be cash or physically settled. In a cash settlement, the protection buyer will receive an amount equal to the par value minus the price of the defaulted asset.

- Other use: hedging credit/gain exposure to credit risk

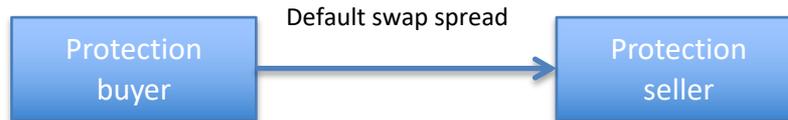
Tools used by Hedge Funds

- Derivatives:

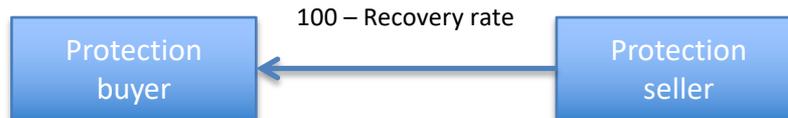
- Basic derivatives contracts:

Credit derivatives: Mechanics of a CDS

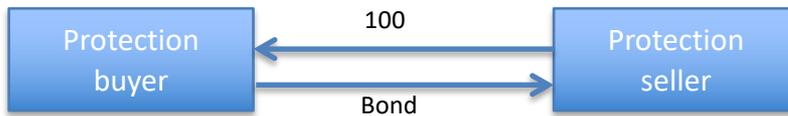
During the swap



After a credit event, case of a cash settlement



After a credit event, case of a physical settlement



Tools used by Hedge Funds

- Derivatives:

- Conclusion: most derivatives positions are closed before maturity and never result in physical delivery of the underlying (offsetting transactions)

- Leverage:

- There is leverage when the amount of money invested or the economic exposure is higher than the available equity capital.
- Balance sheet leverage: the ratio of the fund's balance sheet assets to equity.
- Balance sheet leverage fails to take into account market, credit and liquidity risks in a portfolio, as well as the use of off-balance sheet products such as derivatives.
- Economic leverage is a better measure, but difficult to measure.
- **Examples:**
 - Mortgages: 20% down-payment to buy a home: we would say that the leverage ratio is 5 to 1
 - Leverage magnifies both profits and losses. Example \$1000 invested with a leverage ratio of 10 to 1. If the stock rises 10%, without leverage, the return is 10%; with leverage the return is 110% (ignoring borrowing costs). If the stock drops 10%, without leverage the loss is \$100, that is 10%; with leverage, the loss would have been \$1100, which is more than the initial equity capital.
 - The operation only makes sense when the return on investment is higher than the cost of borrowing.
- Advantages: improves market liquidity, lowers credit costs, and results in a more efficient allocation of resources in the economy.

Tools used by Hedge Funds

▪ When leverage goes wrong: the case of LTCM (Long-term Capital Management):

- Founded by Wall-Street and Academic luminaries (Nobel Prize winners Scholes and Merton), and former FED vice-chairman
- Strategy: fixed-income arbitrage, i.e. finding inefficiencies in the fixed income markets and taking positions that would become profitable when these perceived inefficiencies were eliminated. Those inefficiencies were small, so large positions needed to be taken in order to generate worthwhile returns



Tools used by Hedge Funds

- **When leverage goes wrong: the case of LTCM (Long-term Capital Management):**

- Leverage: initially 16 to 1, then 25 to 1
- 1998: disaster struck when the Russian government devalued the rouble and defaulted on its debt
- In early 1998, LTCM had felt that quality liquid investment were overpriced with respect to less liquid or less creditworthy investments. Therefore, it had undertaken many trades in which it was betting that spreads between high-quality and lower-quality investment should narrow. But with the Russian default, the sudden enormous demand for high-quality investments caused these spreads to balloon (supply/demand dynamics). Furthermore, the phenomenon affected all markets.
- By the end of August 1998, LTCM's capital had shrunk to \$ 2.3 billion and its asset base was approximately \$107 billion. A leverage ratio over 45 to 1, particularly high in such volatile environment.
- Portfolio losses then accelerated across all trades.

Tools used by Hedge Funds

▪ When leverage goes wrong: the case of LTCM (Long-term Capital Management):

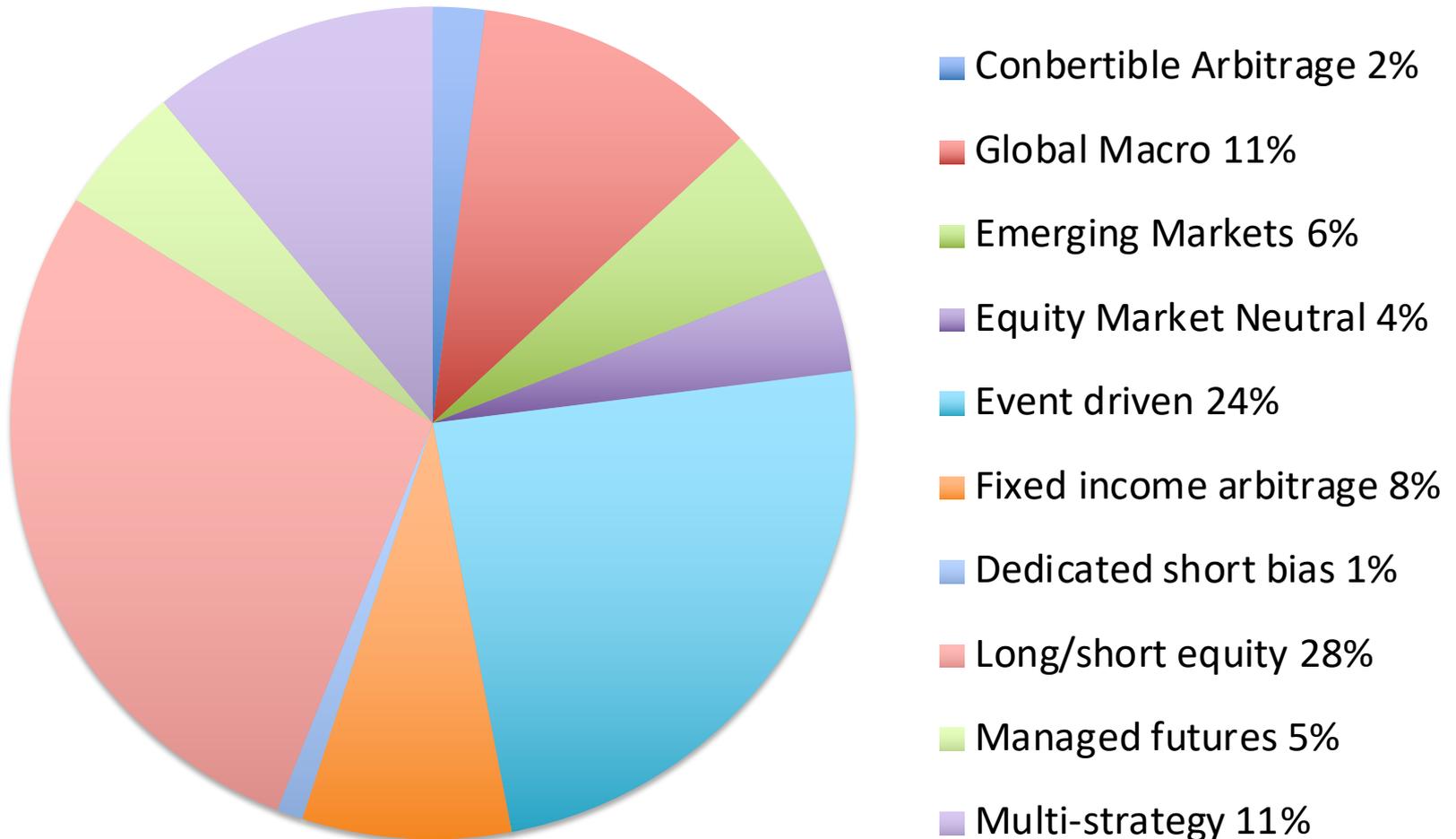
- On September 19th, LTCM's capital was reduced to only \$600 million, with an asset base of approximately \$80 billion: margin calls unanswered to LTCM's counterparties.
- Ultimately one dollar invested with LTCM in March 1994 was worth about 10 cents in December 1998. LTCM had initially used its capital as collateral to establish bets on about \$ 125 billion in securities, half in long positions and half in short positions. It then used those securities as collateral to enter into off-balance sheet transactions to a total notional amount of more than a trillion dollars (futures, swaps and options). In total the fund had more than 60000 trades on its books and a leverage of more than 500 to 1 (leverage on leverage).
- Liquidating the fund would have disrupted most major markets
- Finally: LTCM was bailed out by the a consortium of 14 banks led by the Federal bank of New York which offered to buy 90% of LTCM for \$3.65 billion, which brought the total equity value to approximately \$4 billion (from \$350 million), and the leverage ratio to 25 to 1.
- LTCM represented a turning point in the history of hedge funds. As a result, several banks scaled down their proprietary trading desks and imposed higher margin requirements when lending to hedge funds. And hedge funds themselves reduced their use of leverage.
- Conclusion: the combination of tremendous leverage and illiquid markets is a recipe for disaster.

Hedge Funds Strategies and Trade Examples

- INTRODUCTION: Hedge funds no longer represent a homogeneous group
 - There exists a plethora of investment strategies with different risk and return characteristics
 - There is no accepted norm to classify the different hedge fund strategies
 - We match the classification suggested by CS/Tremont, which distinguishes 10 different strategies:
 1. Long/short equity: funds that invest in equities and combine long investments with short sales to reduce but not completely eliminate market exposure
 2. Dedicated short: funds that only use short positions. In a sense, they are the mirrors of traditional long-only managers
 3. Equity market neutral: funds that seek to exploit pricing inefficiencies between related equity securities while at the same time exactly neutralizing exposure to market risk
 4. Distressed securities funds: funds that focus on debt or equity of companies that are or are expected to be in financial or operational difficulty. This may involve reorganizations, bankruptcies, distressed sales and other corporate restructurings
 5. Merger arbitrage funds: funds that invest in event-driven situations including leveraged buyouts, mergers, or hostile takeovers
 6. Convertible bond arbitrage: funds that seek to exploit pricing anomalies between convertible bonds and their underlying equity
 7. Fixed income arbitrage: funds that use a wide spectrum of strategies that seek to exploit pricing anomalies within and across global fixed income markets
 8. Emerging market funds: funds that invest in all types of securities in emerging countries, including equities, bonds, and sovereign debt
 9. Global macro: funds that tend to make leveraged, directional, opportunistic investments in global currency, equity, bond and commodity markets on a discretionary basis
 10. Managed futures (commodity trading advisors): funds that trade primarily listed commodity and financial futures contracts on behalf of their clients, mostly on an algorithmic basis

Hedge Funds Strategies and Trade Examples

Breakdown of hedge fund assets by investment strategy (based on the CS/Tremont Index)



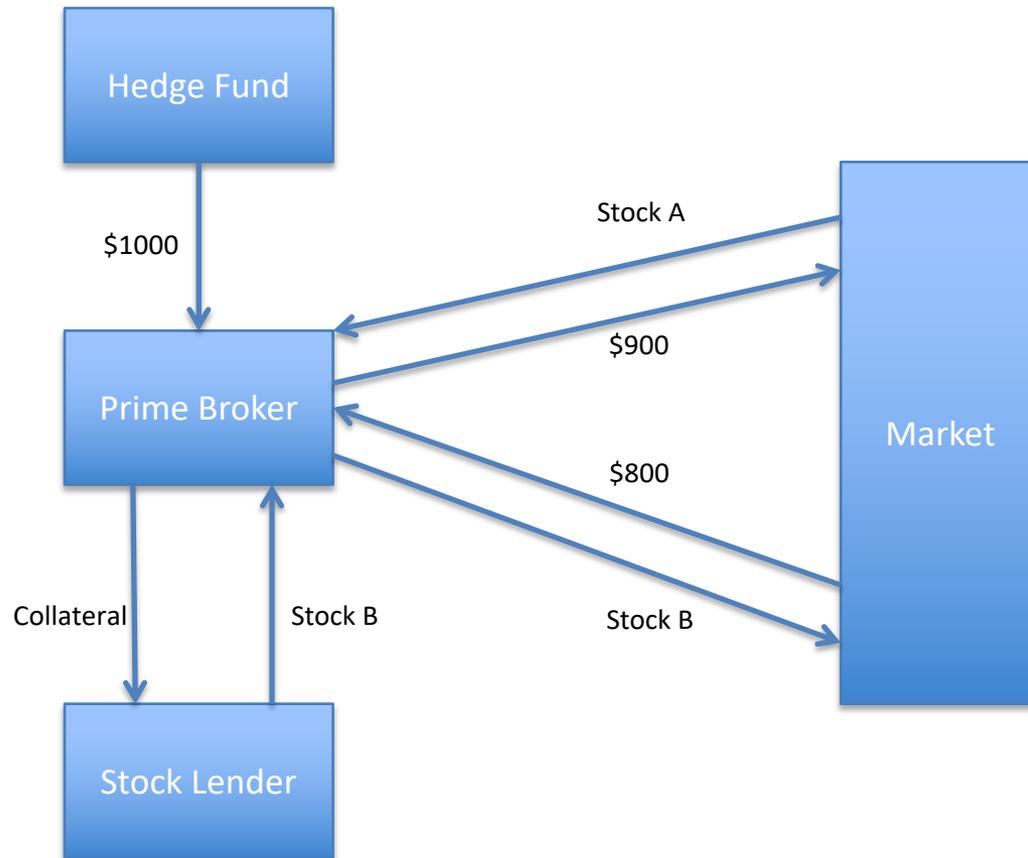
Hedge Funds Strategies

▪ Long/Short Equity strategies:

- It consists primarily in combining long and short positions in equities, resulting in portfolios that have reduced market risk
- Same fundamental analysis as traditional funds but they can generate profits even in declining markets as well
- Example: a manager has identified two potential investments. According to him, stock A is undervalued, while stock B is overvalued. The manager will take a long position in stock A and a short position in stock B. Assuming a starting capital of \$1000:
 - Step 1: the manager deposits \$1000 at a custodial prime broker
 - Step 2: the manager starts by purchasing \$900 worth of stock A that he perceives to be undervalued. He pays for these shares with the fund's equity capital. His situation with the broker will then be a long position in stock A for \$900 and a long cash position of \$100. The fund has a net long exposure of 90% and a gross exposure of 90% of its equity capital.
 - Step 3: the manager now sells 800\$ worth of stock B that he perceives to be overvalued. This increases his cash balance by \$800. This is a short sale.
 - Step 4: the prime broker arranges to borrow \$800 worth of the required shares from a stock lending institution such as a large institutional investor. It freezes some collateral to secure the transaction (for instance the \$800 in cash just cashed in as well as some previously bought A shares). The prime broker also charges the hedge fund a rent of say 1% per annum.
- At this stage, the fund is using leverage. Its assets consist of \$900 of stock A (long), \$800 of stock B (short), plus \$900 in cash (that could in theory be used to purchase other stocks). In practice cash is excluded from the assets when calculating leverage. Investors would therefore say the fund has a 90% long exposure, an 80% short exposure, a 170% (90 + 80) gross exposure and a 10% (90 – 80) net long exposure.

Hedge Funds Strategies

Long/Short Equity strategies: An example



Hedge Funds Strategies

▪ Long/Short Equity strategies: sources of return

- The ability of combining long and short positions increases portfolio efficiency and potentially increases alpha generation.
- The first source of return is the spread in performance between the long and the short positions. Ideally the stocks on the long side should appreciate while the shorted stocks should decrease in value. This is why long/short investing is often referred to as double alpha strategy (the term alpha is used here to refer to the outperformance of an investment). One alpha may come from the long side (the undervalued stock appreciates) and the other alpha may come from the short side (the overvalued stock depreciates).
- The second source of return is the interest rebate on the proceeds of the short sale that are used as collateral
- The third source of return is the interest paid on the liquidity buffer that remains as a margin deposit to the broker (the interest rate is generally close to the Treasury-bill rate).
- The last source of return is the spread in dividends between the long and the short position. Stock borrowers need to reimburse stock lenders for dividends paid on borrowed stocks, while they cash in dividends on the long position.
- Three purposes from the short position:
 - It can represent a bet on an overvalued asset
 - It can be used to hedge the market risk of the long position
 - It collects interest on the short amount (when interest rates are high, there is an incentive to sell short, as it provides a buffer against the potential increase in value of the short positions).

Hedge Funds Strategies

▪ Long/Short Equity strategies: sources of return

- What matters is that the long position outperforms the short position on a relative basis, which explains why long/short funds have the ability to perform well in both bear and bull markets.
- Suppose that:
 - Stock A share price increases from \$10 to \$12 over a month. This represents a 20% increase in total, i.e. a profit of $20\% \times \$900 = \180 on the long position
 - Stock B share price increases from \$10 to \$10.5 over the same period. This represents a 5% increase in total, i.e. a loss of $5\% \times 800 = \$40$ on the short position.
 - If the interest paid on the short proceeds are 6% per annum, this represents a gain of $0.5\% \times \$800 = \4 over a month.
 - The unused capital of \$100 can also be invested at 6% p.a., which gives $0.5\% \times 100 = \$0.5$ of interest
 - Finally, if the fee to borrow the shares is 1% p.a., the cost over one month will be $(1\%/12) \times \$800 = \0.66 .
 - Total profit = $\$180 - \$40 + \$4 + \$0.5 - \$0.66 = \143.84
 - As a proportion of the initial capital which was \$1000, the total return is 14.38%.
 - A long only position invested equally in shares A and B would have achieved a return of 12.5%

Hedge Funds Strategies

▪ Long/Short Equity strategies: sources of return

- If we assume, for instance, that the stock B share price has fallen by 5% over the month, the gain would be as follows:
 - Variation in A shares: +\$180
 - Variation in B shares: +\$40
 - Interest on collateral: +\$4
 - Interest on liquidity buffer: +\$0.50
 - Renting fees: -\$0.66
 - Total profit: \$223.84
 - The return now looks much more favorable at 22.38% for the long/short position, versus only 7.5% for the equally weighted long-only portfolio.
 - The long/short portfolio has a much lower risk than the long-only position. The reasons for that is simply the diversification of risks. There is a good chance that securities A and B are somehow positively correlated, so that grouping them in a long-only portfolio will only result in limited diversification.
 - On the long/short, if A and B are positively correlated, the correlation between the long and short position will be negative.
 - Typically, long/short hedge fund managers prefer to take positions in highly correlated securities to diversify risk, while long-only managers are rather looking for non-correlated securities

Hedge Funds Strategies

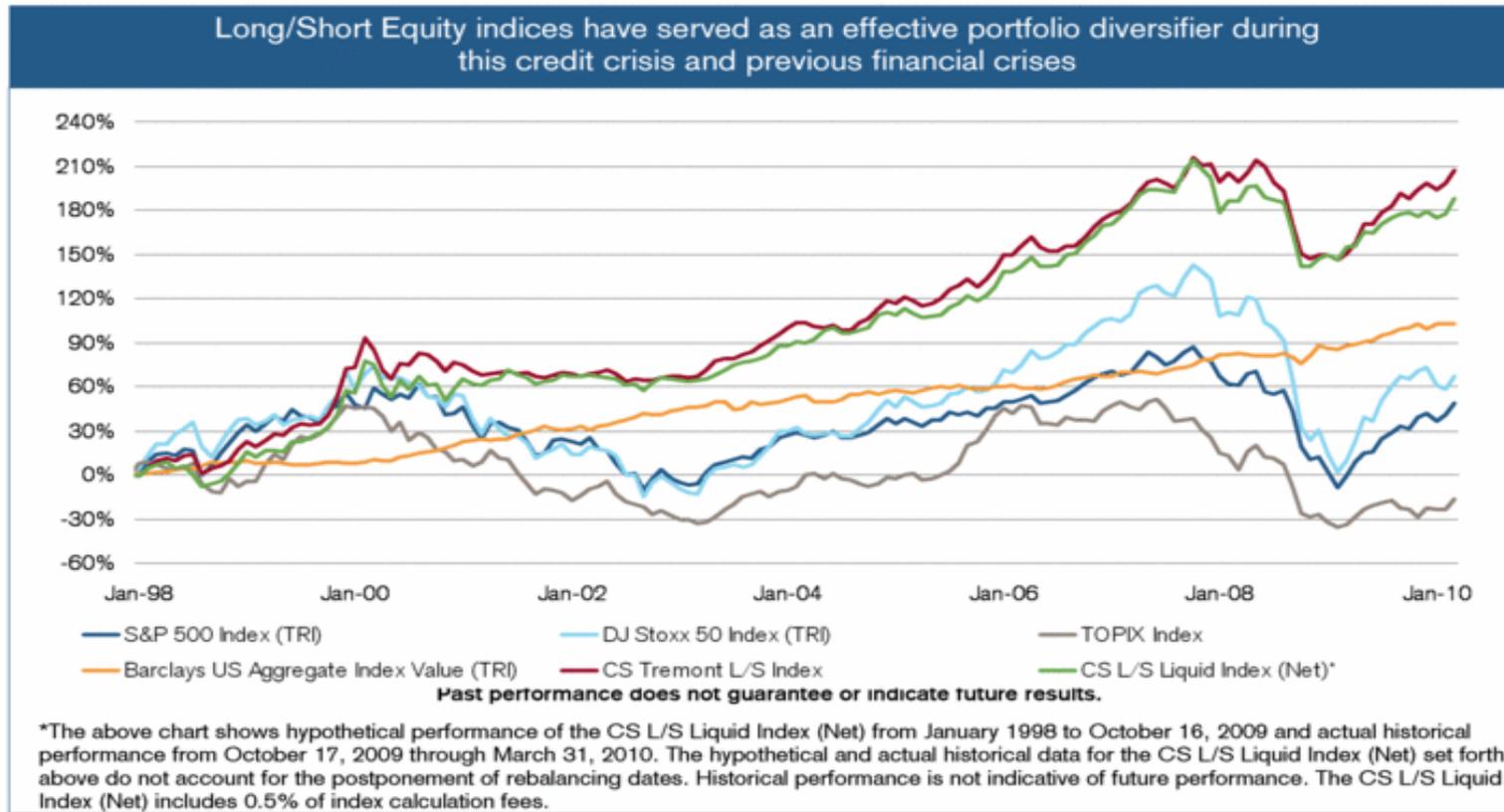
- **Long/Short Equity strategies:**

- Disadvantages:
 - Higher trading costs
 - Higher turnover than buy and hold strategies
 - Lag in bull markets: particularly during bullish markets, short positions act as a hedge and reduce the market exposure
 - Net long bias: i.e. a higher long exposure than a short exposure.
- Investment approaches:
 - Valuation-based approach (Benjamin Graham / Warren Buffett / DCF analysis and relative value analysis): fundamental analysis to determine the long-term intrinsic value of a stock. The implicit assumption is that in the long run, stock prices should be mean reverting and should return towards their intrinsic value.
 - The valuation-driven long/short equity investment approach is in total contradiction with the efficient market hypothesis (EMH).
 - Inefficiencies mean opportunities for hedge funds. Hedge funds may look at companies that have no bank or broker analyst coverage.
 - Quantitative approaches:
 - Deal with very large number of stocks and add value on the portfolio construction side (multifactor models and quantitative tools)
 - Activist strategies:
 - They use their expertise and their fund's influence as minority shareholders to effect changes in the companies they invest in (Carl Icahn).

Hedge Funds Strategies

Historical Performance

- Liquidity
- Transparency
- Diversification



Hedge Funds Strategies

- **Other famous trades:**

- *George Soros and the ERM Crisis of 1992 (Global Macro Strategy):*
 - The ERM (Exchange Rate Mechanism) was essentially a managed-float exchange rate system where the currencies of participating countries were allowed to fluctuate within pre-specified bands. Each central bank had to intervene to make sure that its currency remained within the prescribed band. Such intervention took the form of purchases of the currency in the event of a fall vis-à-vis the central rate, or of sales in the event of a rise.
 - Speculators like George Soros sold short \$10 billion of British pounds, betting that the British Pound would exit the ERM and would have to devalue its currency, and pocketing \$1 billion in just one day.
- *John Paulson and the Subprime crisis:*
 - In 2006 Paulson organized a new fund (Paulson Credit Opportunity Fund) betting against bonds backed by subprime mortgages using credit default swaps. Paulson shot to fame and fortune when his investment strategies paid off during the subprime housing market crash. His bet against the subprime mortgage bubble has been called “the greatest trade ever”. Paulson betted against the ABACUS CDO (engineered by Goldman Sachs) and netted approximately \$1 billion in doing so.
 - On the wrong side of the deal: IKB Deutsche Industry Bank, resulting in losses estimated at \$150 million.

Hedge Funds Strategies

- Other famous trades: Could we have this slide illustrated by a flow chart with the sequence of events?

- ***John Paulson and the Subprime crisis:*** Considered by many economists to be the worst financial crisis since the Great Depression, the financial crisis of 2007 was primarily the consequence of a liquidity shortfall in the U.S. banking system. One early indicator that a financial crisis was imminent was the collapse of the subprime mortgage market. Subprime, by definition, means “less than prime,” and in the mortgage industry, subprime loans are considered to be one of the riskiest classes of credit. Subprime borrowers are those who typically do not qualify for conventional financing and are characterized by undesirable financial metrics such as low credit scores, high debt-to-income ratios, and limited net worth. During the early-to-mid 2000’s, subprime borrowers were able to obtain financing rather easily due to the abundance of credit available at historically low costs and lax mortgage underwriting standards. Borrowers gorged on the seemingly infinite stream of easy, cheap debt. Many borrowers then used the loans to buy houses. As demand for homes skyrocketed, housing prices began to (artificially) inflate and deviate from their true underlying values, effectively creating a bubble. Approximately 80% of U.S. mortgages issued to subprime borrowers during this time were adjustable-rate mortgages (ARMs). In mid-2006, home prices in the U.S. peaked and subsequently began a rapid decline. Increasing interest rates were a significant contributing factor to the house price decline. In addition, “teaser” rates on subprime ARMs were beginning to reset at prevailing higher interest rates. As the economy contracted, subprime borrowers were unable to refinance their freshly adjusted high-rate mortgages into conventional fixed-rate mortgages. The result was an increase in delinquencies, defaults, and eventually foreclosures. The effects of the subprime market meltdown were devastating and far-reaching. As many of the subprime mortgages were pooled together after origination and re-sold as packaged securities, numerous economic sectors – regardless of size – were adversely impacted by the subprime fallout.

Hedge Funds Strategies

- Other famous trades:

- *John Paulson and the Subprime crisis: the instruments*

- Residential Mortgage-Backed Securities (RMBS). Residential mortgage-backed securities are commonly issued bonds that are backed by pools of residential real estate mortgages. The RMBS related to The SEC vs. Goldman Sachs case were comprised of subprime mortgages.
- Synthetic CDOs. Collateralized debt obligations are a type of security whose value and payments are derived from a portfolio of underlying (fixed income) assets. CDO securities are split into different risk classes, or tranches, whereby senior tranches are considered the safest. Interest and principal payments are made in order of seniority. Thus junior tranches offer higher coupon payments (an interest rates) or lower prices to compensate for additional default risk. A synthetic CDO is similar to a traditional cash CDO. The primary difference between the two is that a synthetic CDO does not own the underlying assets. Alternatively, synthetic CDOs gain credit exposure to a portfolio of fixed-income assets through the use of credit default swaps. The risk of loss on synthetic CDOs is divided into tranches just like traditional (cash) CDOs.
- Credit Default Swap (CDS). Credit default swaps are a form of insurance policies and function similarly. CDSs are agreements between buyers who desire some form of debt default protection and sellers that provide a buyer with a nominal payoff in the event of credit default. Buyers of CDSs pay a series of fee premiums – similar to an insurance policy – for the protection. CDSs can be used as a way to hedge default risk for those who own bonds, or they can be used as a way to speculate (commonly referred to as naked credit default swaps) on debt issues and the creditworthiness of other entities without having to hold their bonds.

Hedge Funds Strategies

- Other famous trades:

- *John Paulson and the Subprime crisis: outcome*

- Goldman was approached by John Paulson of Paulson & Co. to assemble a synthetic CDO, dubbed **ABACUS 2007-AC1**, in exchange for a \$15 million fee.
- Goldman brought in an outside asset manager (ACA Capital) to aid in the selection of collateral that was to comprise ABACUS. In the end, it consisted primarily of subprime mortgage securities.
- Goldman sold ABACUS to German-based bank IKB.
- Paulson effectively shorted ABACUS by entering into credit default swaps to buy protection on specific layers of the CDO (the senior tranches).
- The CDO ultimately failed as a result of the subprime market meltdown. In the end, John Paulson netted approximately \$1 billion, IKB lost approximately \$150 million, ACA Capital lost approximately \$900 million, and Goldman lost approximately \$100 million (which was partially offset by the \$15 million fee it received from Paulson & Co.).
- Goldman was fined \$550 million and eventually conceded saying that the marketing materials for the ABACUS 2007-ACI transaction contained incomplete information. In particular, it was a mistake for the Goldman marketing materials to state that the reference portfolio was 'selected by' CA Management LLC without disclosing the role of Paulson & Co. Inc. in the portfolio selection process and that Paulson's economic interests were adverse to CDO investors. Goldman regrets that the marketing materials did not contain that disclosure.

Hedge Funds Strategies

- **Investment books that are a useful read:**

- The intelligent investor by Benjamin Graham
- The little book of common sense investing by Jack Bogle
- The investment answer by Daniel C. Goldie and Gordon S. Murray
- Security Analysis, by Benjamin Graham and David L. Dodd
- A random walk down Wall Street: the time-tested Strategy for successful investing, by Burton Malkiel
- The Essays of Warren Buffett, by Warren Buffett
- Reminiscences of a stock operator by Edwin Lefevre
- Common Stocks and uncommon profits
- The Clash of the Cultures by John Bogle
- Elements of investing: easy lessons for every investor, by Burton Malkiel and Charles Ellis
- Poor Charlie's Almanack, edited by Peter Kaufman
- The most important thing illuminated, by Howard Marks
- For trading:
 - Saxo online trading platform
 - Can start with 10000 USD
 - Markets.com
 - <https://www.udemy.com/create-your-own-hedge-fund-double-your-money-every-year/>

Hedge Funds Strategies

- **Dedicated Short:**

- Managers exclusively look for overvalued companies, borrow their shares and sell them short
- They then wait for the stock price to decline so they can buy the shares back at a cheaper price, return them to the lender and pocket the difference. If contrary to the expectations, the share price increases, the repurchase price will be higher than the initial selling price and they will make a loss.
- Hedge funds that exclusively focus on selling short are now rare as many of them have migrated to the long/short space, where they operate with a net short bias.
- Pros and cons:
 - The set of short selling opportunities is largely unexploited. In fact, the asset management industry seems to be primarily searching for long-term buy and hold opportunities rather than for good short sales. Furthermore, brokers and analysts focus on what to buy and not what to sell
 - Little competition to identify overvalued securities. There is almost never an official sell recommendation on Wall Street, no matter how bad a particular company's financial results are or how dismal its business prospects. Research analysts in investment banks have a conflict of interests that prevents them from issuing a negative recommendation on a company.
 - The consequence is that good news is more widely known and factored into stock prices than bad news. Markets therefore tend to be inefficient with a set of under researched and overpriced securities, thus serving up an ideal free lunch for short sellers.
 - However, in the long run stocks tend to appreciate in price and reward investors with a positive equity risk premium.

Hedge Funds Strategies

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 - However, in the long run stocks tend to appreciate in price and reward investors with a positive equity risk premium.
 - While they wait, short sellers are hit by the natural long-term uptrend of equity markets, and they must pay the dividends on the shorted stocks to their lenders.
 - Short squeeze: as prices go up, more and more short sellers will have to buy back shares to close their position. Consequently, the stock price will continue to rise, triggering more covering of losses by short sellers, more buying and so on. In such situation, the shorted stock becomes even more overpriced

Hedge Funds Strategies

- Dedicated Short:

- *Pros and cons:*

- When establishing short positions, short sellers should always set strict quitting prices (say a 10% loss per investment) and stick to them. If prices reach that limit, short sellers must resist the temptation to hang on, and take their losses. Dedicated short selling can be extremely risky as the downside potential is theoretically unlimited.

- *Typical target companies:*

- Companies with weak financials and a high share price
 - Companies which regularly change their auditors or regularly delay filing their financial reports with the SEC
 - Companies built-in around a single product
 - Companies involved in industries where there is over-capacity
 - Companies whose P/E ratios are much higher than can be justified by their growth rates
 - Companies that have been involved in a failed merger
 - Companies with a public potential image problem
 - Companies that claim to have discovered new reserves of natural resources, such as oil or gold, or have invented new methods of extraction
 - Companies where more than 10% of the total market capitalization has been sold short by some market participants
 - Companies suing or responding systematically to their short sellers in an attempt to silent them

Hedge Funds Strategies

- Dedicated Short:

- *Perception of Short selling:*

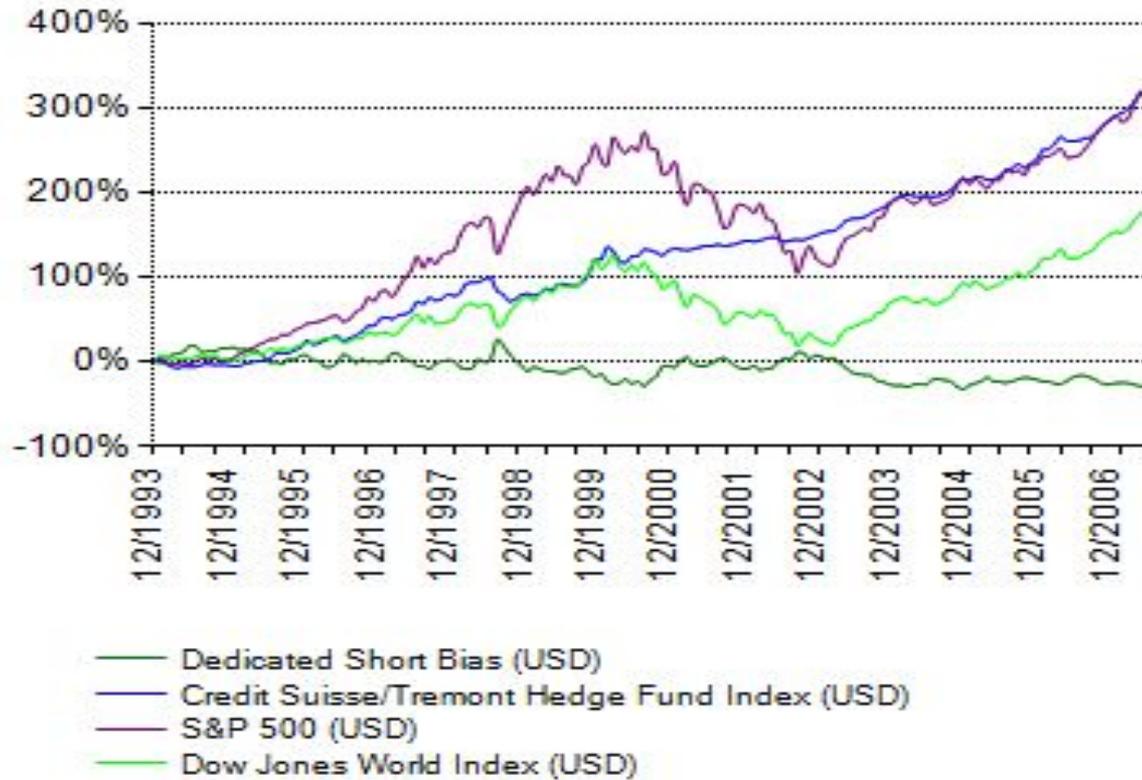
- Short sellers have always been unpopular on Wall Street as they seem to oppose rising values, increasing wealth and general prosperity.
 - In some cases, the most unethical traders will attempt to short and distort the market, i.e. take short positions and then use a smear campaign to drive down the target stocks.
 - Example:
 - Manuel Asensio: between 1996 and 2003, Asensio issued strong sell recommendations on 29 different companies. An investor managing a portfolio according to Asensio's recommendations would have realized a compound annual return of 46.6% over the entire eight-year period, compared with 8.4% for the S&P 500. And if an investor had sold short the S&P 500, he would have lost 60.8% of his investment over the same period.

- *Historical performance:*

- The historical performance of dedicated short hedge funds has been relatively disappointing
 - Over the period January 1994 to December 2005, dedicated short hedge funds, as measured by the Dedicated Short Bias index delivered an average return of -2.0% p.a. with a volatility of 18.6%. By contrast the S&P 500 delivered an average return of 8.6% p.a. with a volatility of 16% and the CS/Tremont Hedge Fund Index delivered an average return of 10.7% p.a. with a volatility of 8.1%.

Hedge Funds Strategies

Dedicated Short Performance:



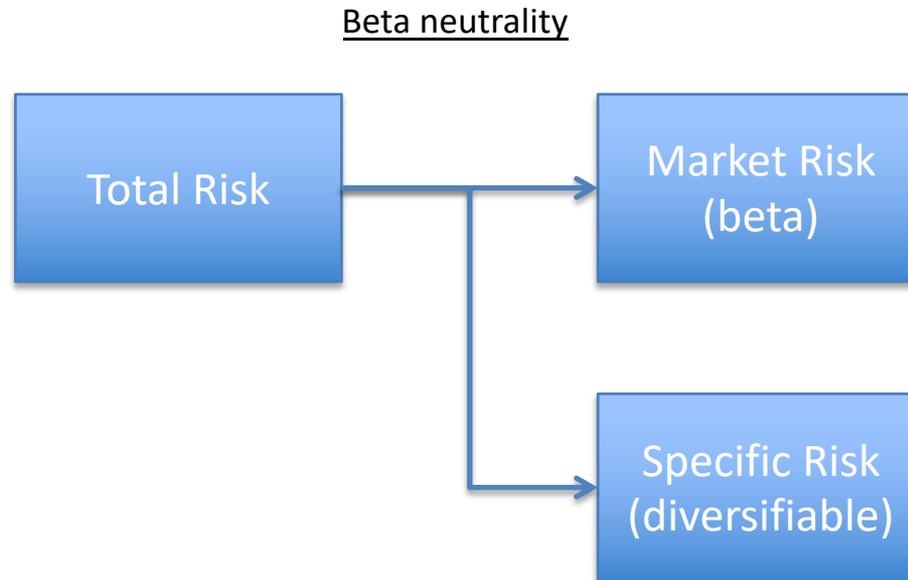
Hedge Funds Strategies

- Equity Market neutral:

- Portfolio construction process: relationship between long and short positions
- The goal of equity market neutral managers is to avoid any market exposure in their portfolio. Selling and buying become concurrent activities. Long and short positions are regularly balanced to remain market neutral at all times, so that all of the portfolio's return is derived purely from stock selection and no longer from market conditions.
- When correctly implemented, it offers the promise of true absolute returns (alpha) without having to bear the market sensitivity (beta).
- Example: consider a plain vanilla long/short equity portfolio with \$10 million of initial capital. Say this capital is invested as follows: \$9 million long shares and \$6million short sales. The portfolio has a positive net long market exposure of \$3 million (\$9 million long minus \$6 million short). To be dollar neutral, we need to have equal dollar investments in the long and the short positions, say for instance \$9 million long and \$9 million short. We need to increase the size of the short position by \$3 million. Going forward, we will also need to rebalance our long and short positions on a regular basis to maintain dollar neutrality.

Hedge Funds Strategies

- Equity market neutral:



Splitting the risk of a stock or a stock portfolio into a market risk component and a specific risk component.

Hedge Funds Strategies

- Equity Market neutral:

- A commonly used risk-based definition of market neutrality relies on beta: a portfolio is said to be market neutral if it generates returns that are uncorrelated with the returns on some market index. Since beta is calculated from the correlation coefficient, a zero correlation implies a zero beta.

- MPT (modern portfolio theory):

- **The volatility of a stock can be decomposed into a market risk component and a specific risk component.** The market risk component depends on the volatility of equity markets as well as on the market risk exposure, which is measured by the beta coefficient. The specific risk component is independent from the market and it normally gets diversified away at the portfolio level.

- **The beta of a portfolio** is a weighted average of the betas of its component stocks. Consequently, being dollar neutral does not necessarily guarantee that the portfolio will be insensitive to the market return, i.e. will have a beta equal to zero. It all depends on the beta of the long and short positions. For instance, if the beta of the long position is 1.4 and the beta of the short position is 0.7, an equal dollar allocation between the two have a net beta of $0.35 = (50\%) * 1.4 - (50\%) * 0.7$. This positive beta implies that the market risk of our dollar neutral portfolio is not nil and that its correlation to equity markets is actually positive. To make our portfolio really beta neutral, we need to size the long and short positions adequately. In our example, given the ratio of two betas (1.4 versus 0.7), we would need to double the size of the short position relative to the long position. In this case, the beta will be exactly zero, which means that the systematic risk of the portfolio has been neutralized.

Hedge Funds Strategies

- Equity Market Neutral:

- *Why a hedge fund manager might want to have a **beta neutral portfolio**:*

- To take risks only where he has skills. Many hedge fund managers prefer to focus on stock selection where they think they have a competitive advantage, rather than on forecasting the returns of the market or of some of its sub-sectors. Consequently, they prefer to run a portfolio of carefully selected stocks but with not net beta exposure, as this makes them completely independent from the behavior of equity markets.

- *Remark:*

- Factor models determine the precise sources of risks in portfolios, quantify their exposures and eventually neutralize them. Factor models precisely identify these common factors and determine the individual stocks' return sensitivity to these factors. They also provide estimates of the variances, covariance, and correlation coefficients among common factors, which will be very useful to quantify the overall risk of a portfolio and split it based on its sources. To create a factor neutral portfolio, it is necessary to have beforehand identified a series of factors that influence the returns of individual stocks. Example of factors: sector risk, macro factor risks, micro factor risks. A factor model allows quantitative portfolio managers to statistically construct a portfolio having the highest expected excess return while being neutral to a selected series of underlying factors.
- As more risk factors are being hedged away, the opportunity set to add value is reduced. Ultimately, if all risk factors are perfectly hedged away, the opportunity set to add value is reduced. Ultimately, if all risk factor are perfectly hedged, the portfolio becomes risk free and should theoretically yield the risk-free rate, minus transaction costs. Market neutrality is therefore a trade-off between eliminating some undesirable risk sources and reducing the set of return generating opportunities. For skilled quantitative managers, market neutral is a comfortable space to operate into, because it allows them to avoid taking risk in areas where they do not have skills while simultaneously maintaining some risk exposure where they have a competitive advantage.

Hedge Funds Strategies

- Equity Market Neutral:

- Market neutral strategies are often termed “double alpha strategies”, because they aim to achieve a zero beta exposure to a set of specified risks while harvesting two alphas, or active returns – one from the long position and one from the short position.
- Example1: Pair trading
 - Find stocks whose prices should normally move together
 - Take a long/short position when their prices diverge sufficiently
 - Hold the position until the two stock prices have converged.
 - It is a mean-reverting strategy, which is making a call on the relationship between two securities.
 - This strategy is often constrained to be dollar neutral
 - The success of this strategy depends on the approach chosen to identify potential profitable trading pairs, i.e. model and forecast the time series of the spread between two related stocks.
 - Pair trading goes in contradiction with the weakest form of market efficiency.

Hedge Funds Strategies

- Equity Market Neutral:

- Example 2: statistical arbitrage:

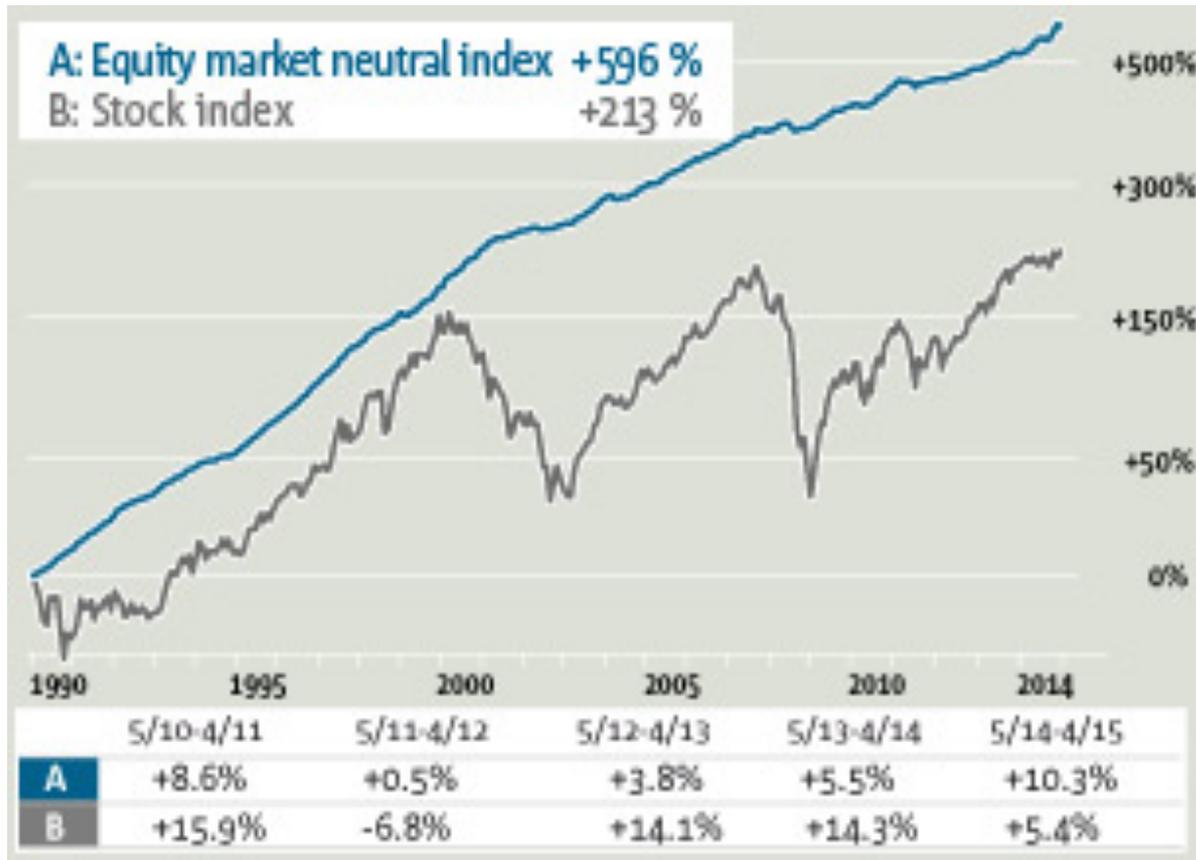
- Extension of the pairs trading approach to relative pricing. Rather than looking for a few pairs of securities that diverge from their historical relationship, statistical arbitrageurs slice and dice the whole universe of stocks according to several criteria and look for systematic divergences between groups.

- Historical performance:

- The historical performance of equity market neutral hedge funds has been impressive, particularly on risk-adjusted returns. Between 1994 and 2005, equity market neutral hedge funds (as measured by the CS/Tremont Equity Market Neutral Index) delivered an average return of 9.92% p.a. with a volatility of 2.96%. By contrast over the same period, the S&P 500 delivered an average return of 8.6% p.a. with a volatility of 16%

Hedge Funds Strategies

Equity Market Neutral



Hedge Funds Strategies

- **Distressed Securities:**

- Focus on investment opportunities from the darkest side of financial markets, namely the securities of companies in financial distress, default or bankruptcy. The role of these funds is often controversial, particularly for the public. However, distressed securities funds play a critical role in the restructuring process of a company.
- Money flowed into the distressed public utility industry in the 1930s and into distressed real estate in the 1980s. But despite the gains made by the vulture investors on each of these occasions, distressed securities remained unattractive for the majority of investors. In the absence of an effective active secondary market, only specialized investment boutiques dared to introduce them into their portfolios.
- The foundations of the current **US distressed debt market** were set in the 1980s with the creation of the junk bond market. It evolved from a highly illiquid bazaar with only a few specialist buyers into a robust and relatively liquid secondary market for deeply discounted debt.
- Michael Milken: thanks to him, **junk bonds** became an important alternative source of debt finance over the 1980s for non-investment grade, small and medium-sized high-tech and innovative firms that used to rely exclusively on bank debt.
- Distressed securities market today: debt instruments are usually characterized in terms of ratings, with reference to Moody's Investor Service or Standard & Poor's. Both agencies have a similar 10-grade scheme ranging from AAA to D. Bonds rated BBB and above are considered investment grade. Bonds rated BB or below are labeled speculative grade or high-yield. Bonds rated D are in default. Distressed securities are typically located at the bottom part of the non-investment grade.
- These debt instruments offer a credit spread larger than 1000 basis points.

Hedge Funds Strategies

▪ Distressed Securities:

- Crucial element to consider when analyzing the distressed securities market is the recovery rate, that is, the severity of losses given default. $\text{Default rate} = 1 - \text{Recovery Rate}$ (Inverse relationship between the two)
- Hedge funds need to identify specific distressed securities whose value may be significantly enhanced by an adequate restructuring process.
- Distress debt supply is a function of the amount of unwise financing or excessive leveraging that has been done in the recent past, the current liquid environment and current economic conditions.
- In Europe, the situation is radically different. One of the reasons is that the European high-yield bond market was virtually non-existent prior to 1997. It is only with the emergence of the EU that the high-yield bond market emerged as an alternative to banking finance. Since currency risk had disappeared, investors were forced to develop new strategies based on credit spreads to a much greater extent. This favored the growth of a full-fledged high-yield market, and, of course, in parallel, resulted in the creation of a distressed high-yield debt secondary market. For instance, post-communist Europe has become an interesting source of distressed securities.
- In general, very few investors like **distressed securities**: most institutional investors cannot buy them – policy not allowing to hold below investment grade bonds – and many individual investors are afraid of the potential risk of loss due to the financial distress of the debtor, and most banks do not want to keep them on their balance sheet because they require a large amount of regulatory capital. Second distressed securities are often highly illiquid. Third, there is little information available on distressed securities (analyst's coverage tends to decline significantly as a firm becomes distressed and is almost non-existent for bankrupt firms). This gives a significant advantage to informed professionals and over non-specialists.
- Hedge Funds love such situations because they can act as temporary liquidity providers and profit from the market's lack of understanding of the true value of these securities.

Hedge Funds Strategies

▪ Distressed Securities:

- Opportunities for Hedge Funds:
 - Attractive discounts due to selling pressure
- Bankruptcy law: Chapter 11 regulations aim primarily at enabling good firms to reorganize and continue operating while being protected from their creditors. Filing for Chapter 11 suspends all judgments, collection activities, foreclosures, and repossessions of property against the filing firm, at least on the short term. However, the filing firm retains possession of its assets, but operates under the close supervision of a bankruptcy court for the benefit of its creditors.
- Priority of claims
- US: debtor-friendly; Europe: creditor friendly (little place for a potential restructuring of distressed companies). Many countries are now considering instituting a more debtor-friendly US-style reorganization approach into their bankruptcy laws. This trend is encouraged by the IMF

▪ Performance of distressed Securities related strategies:

- Very good performance both on absolute and return and risk-adjusted returns
- 1994 – 2005 (CS/Tremont): average return of 13.44% with a volatility of 6.80%
- Over the same period, the S&P 500 delivered an average return of 8.6% with a volatility of 16% and the CS/Tremont Hedge Fund index: 10.7% p.a. with a volatility of 8.1%
- Distressed securities are significantly exposed to corporate event risk and, as a result, their return distribution cannot be approximated by a normal distribution.

Hedge Funds Strategies

- **Merger Arbitrage:**

- Strategy, simple but profitable: investing in merger and acquisition targets after the deals have been announced, pocketing the spread between the market price of the target company following the announcement and the deal price upon closing.
- Narrow spread, offering a modest nominal total return.
- Goldman Sachs very strong in this area
- Historical perspective on acquisitions:
 - Waves that coincide with increases in share prices and price/earnings ratios
 - First merger wave: 1895 to 1903 : transition from freely competitive, entrepreneurial capitalism to monopolistic, corporate capitalism (emergence of railroads and telegraph), large companies distributing their goods in a larger scale.
 - Creation of Rockefeller's standard oil, General Motors, General Electric, International Harvester, Du Pont, US Rubber, US Steel, Coca Cola.
 - Second wave: 1920 to 1929: merging for oligopoly. Further consolidation in the industry, huge increase in vertical integration, particularly in electricity and gas utilities as well as manufacturing firms.
 - Third merger wave: 1955 to 1973. Bullish stock market, emergence of new sources of financing (issues of convertible preferred stocks and debentures). Resulted in the creation of large conglomerates, essentially through the mergers of companies engaged in non-related activities. Most of these conglomerates did not make much economic sense, therefore the third merger wave ended with the oil crisis and a decline in value of conglomerates.

Hedge Funds Strategies

- **Merger Arbitrage:**

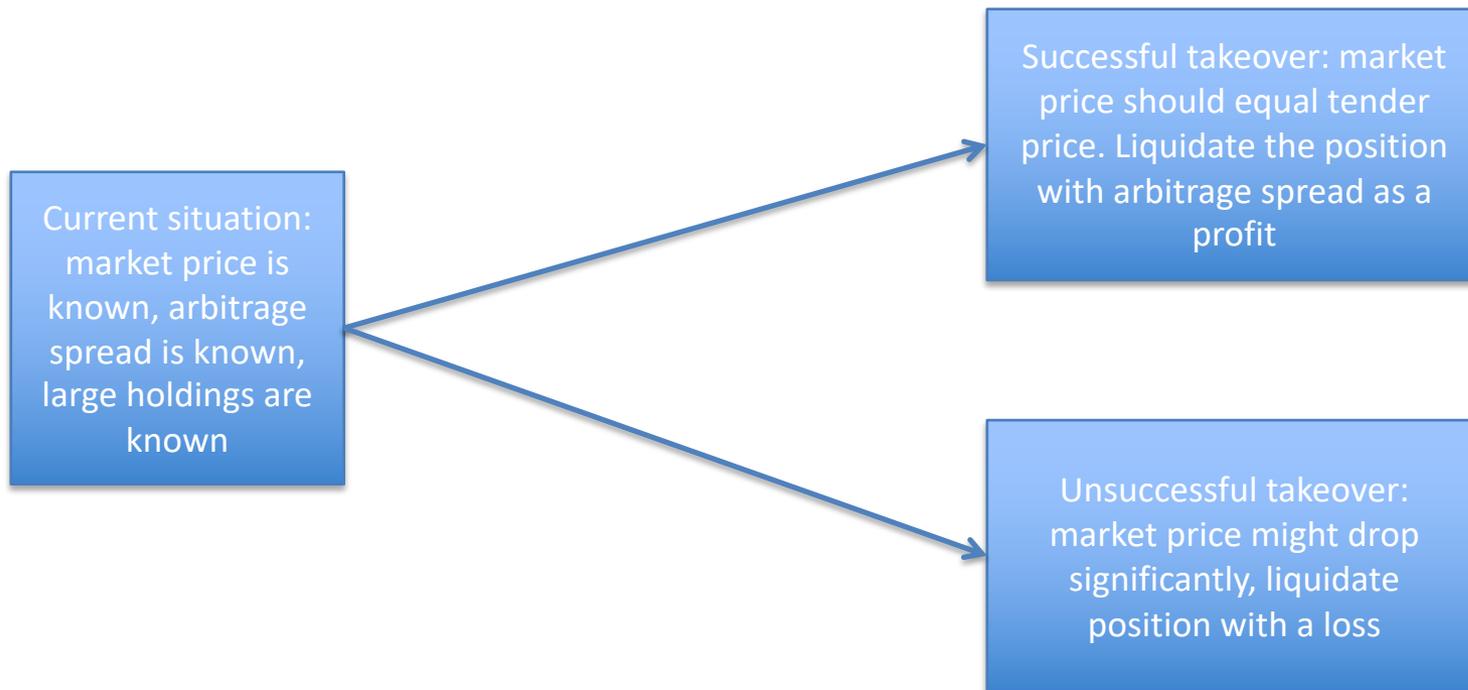
- Historical perspective on acquisitions:

- Fourth merger wave: 1974 to 1989 (takeover wave) (accommodating regulatory environment, low level of interest rates, easy access to junk bonds: explosion of LBOs and predatory takeovers.
 - Ivan Boesky: inspired the movie “Wall Street”
 - Fifth wave: began in 1993 until the financial crisis. Greatest merger wave in history, both in terms of number of deals and size. Most of these transactions were driven by consolidators and focused on strategic rather than purely financial considerations.
 - International mergers represented also a significant part of the activity thanks to:
 - Adoption in Europe of a true single market with a single currency
 - Deregulation and privatization especially of utilities and financial services
 - Liberalization of de jure or de facto restrictions on the foreign ownership of domestic firms, notably in Japan and Korea
 - Rising stock market valuations that made the financing of M&A transactions cheaper

Hedge Funds Strategies

- **Merger Arbitrage:**

- Basic principles: The acquiring entity makes an offer to the current shareholders of the target company, inviting them to sell their shares at a fixed price usually set above the last quoted market price. The difference between the offered price and the last quoted market price is called the arbitrage spread.



Hedge Funds Strategies

- **Merger Arbitrage:**

- Risks inherent in merger arbitrage: a merger arbitrage is essentially a bet on whether a merger will be successful or not.
- Most arbitrageurs only take their positions after the announcement of the merger terms, the initial spread is known and corresponds to their maximum gain.
- The risk is rather in the likelihood of the transaction going through (transaction risk) and on its timing (calendar risk)
- Historical performance:
 - Low-risk hedge-fund strategy with steady returns.
 - Average return of 7.7% with volatility of 4.3% since 1994 (as measured by the CS/Tremont event driven risk arbitrage index)
 - Success of this strategy depends on the availability of a sufficient volume of mergers and takeovers, a sufficient spread on each transaction
 - This strategy works well in boom periods when the market of merger and acquisition is vibrant.

Hedge Funds Strategies

▪ Convertible Arbitrage:

- Combination of two basic types of instruments: debt and equity
- Corporations need to choose between issuing debt or equity to finance their growth.
- Issuing debt is not dilutive but sets stringent requirements in terms of mandatory coupon payments. Issuing equity dilutes existing equity holders but has no imposed cost, as dividends are not mandatory.
- Convertible securities are bond-like instruments that can be converted into equity at the discretion of their owner. They are often issued below their fair value.
- Strategy: purchasing undervalued convertibles and selling short the stock of the issuer to hedge the associated equity risk. Over the years, the strategy has evolved to include directional bets on credit risk, volatility, convexity
- Convertible securities blend the characteristics of equity, debt and option securities
- Parameters:
 - Issuer
 - Time to maturity
 - Annual coupon with first coupon paid in one year (ex. 2% annual coupon)
 - No accrued interests
 - Nominal value or par value is 1000 USD
 - Yield to maturity: total rate of return expected on the convertible bond

Hedge Funds Strategies

- **Convertible Arbitrage:**

- The convertible bond can be converted into shares of the stock of the issuer.
- Conversion ratio: number of shares obtained if one converts 1000 USD of face value of the bond.
- Conversion price: price at which shares are indirectly purchased via the convertible security. It is equal to the market price of the convertible security divided by the conversion ratio.
- Put call parity:
 - Using the put-call parity, a convertible bond can also be analyzed from a put option perspective.
 - $\text{Convertible bond} = \text{Parity} + \text{Put Option} + \text{Value of income advantage}$
- Risk measurement:
 - Interest rate risk and credit risk for the bond component (duration, convexity and credit sensitivity)
 - Equity risk, volatility risk and interest rate risk for the option component
- Historical performance:
 - High absolute returns with low level of volatility.
 - 1994-2005: average return of 8.6% per annum with volatility of 4.9%

Hedge Funds Strategies

- **Emerging Markets:**

- Surge interest due to epic transformations in those countries:
 - Democratization
 - Artificially pegged currencies becoming freely floating
 - Financial disclosure replacing secrecy
 - More stability
 - Privatization
 - Opening up of financial markets
 - Better fiscal and monetary policies
 - Ability to sustain high growth and attract capital
 - Ex of fund manager: Franklin-Templeton
- Representing trillions of dollars in capitalization, in fact emerging markets contribute to over 49% of global GDP but comprise just 9% of global equity markets

Hedge Funds Strategies

- Emerging Markets:

- *Definition:*

- Emerging related to: profit in economic growth based on productivity gains, technological change etc...
 - Often characterized by political instability, currency turbulence and a high foreign debt
 - Many investors like to focus on the growth potential of these markets
 - 85% of the world's population
 - 75% of the world's natural resources

- Attractive stock valuations

- *Long-term fundamentals:*

- Industrilizing populations
 - Undervalued currencies
 - Improving infrastructures
 - Declining current account deficits
 - High savings rates
 - Long-term propensity towards growth

Hedge Funds Strategies

- Emerging Markets:
 - Risky asset class:

Illustration: MSCI emerging markets index



Hedge Funds Strategies

- **Emerging Markets: Could we organise this slide into a table**

- Indexing is not the best approach:
 - It emphasizes diversification instead of picking winners and losers
 - These markets are often highly correlated (phenomenon called as contagion)
 - Many emerging markets have their largest companies concentrated in a few sectors (energy, mining, etc...)
 - Indexing will not necessarily reduce dramatically the overall risk of an emerging market portfolio
 - Lack of liquidity of some securities
 - High transaction costs (trading in Peru is over three times more costly than in Taiwan)
 - Speed of execution (buying or selling securities can take weeks in Colombia)
 - Operational risks
 - Emerging markets are highly inefficient compared to traditional markets (under-researched companies, infrequent trading, slow adjustment to current information)
 - An important part of emerging markets' performance is driven by foreign asset flows
- High volatility and relative inefficiency provides a fertile climate for active strategies that aim at picking the right stocks, the right sectors and/or the right country. As a result, hedge funds are generally better suited than traditional mutual funds to implement active strategies on emerging markets.

Hedge Funds Strategies

- Examples of strategies in Emerging Markets
 - Long/Short equity strategies
 - Global Macro
 - Fixed income
 - Event driven

Hedge Funds Strategies

- Emerging Markets:

- Equity strategies:

- Bottom-up stock pickers
 - High volatility perceived as an advantage because high fluctuations in stock prices often result in short-term mispricing
 - Opportunities to buy shares at a substantial discount and/or sell them at a premium
 - Long bias as short selling is not permitted in the target countries
 - Stock selection process:
 - Mix of qualitative information gathering and quantitative analysis
 - Price target and stop loss level
 - The size of each position is usually based on its estimated upside potential
 - Most EM fund managers invest in local securities, although some of them also use ADRs (American Depositary Receipts). ADRs are certificates issued in the US, quoted in US dollars and traded on a US exchange that represent and are backed by shares of a foreign company held in custody. ADRs offer advantages over trading the original shares (proxy): better liquidity, lower transaction costs, familiar trading mechanisms, etc..

Hedge Funds Strategies

1. Emerging Markets

2. Activist hedge funds

3. Fixed-income strategies:

- Brady bonds: dollar-denominated bonds backed by US Treasury
- Eurobonds: issued in the Eurobond market and denominated in any major hard currency
- Local currency bonds: offer the highest yields
- Most of those instruments are below investment grade and offer a yield that is higher than US treasuries with an equivalent maturity.
 - Extra yield a reward for:
 - » **Interest rate risk**
 - » **Sovereign risk**
 - » **Currency risk**
 - These three risks tend to be highly correlated: a long position in an emerging market debt is essentially a bet on the evolution of sovereign risk.
 - Three pillars:
 - » Country selection (**top-down macroeconomic process**)
 - » Security selection (relative pricing)
 - » Risk management (market risk diversification)

Hedge Funds Strategies

- Emerging Markets:

- Active approach to sovereign debt restructuring:

- Elliott Management: when Peru defaulted in 1996, the hedge fund Elliott Associates paid \$11.8 million on the secondary debt market to buy \$20 million face value of Peru's sovereign debt. In 1997, Elliott Associates rejected the debt restructuring agreement and sued the country for full repayment plus capitalized interest. A Federal Court of Appeals, overturning a state court, ruled in the firm's favor.
 - They were then able to argue they had preferred creditor status, so that no payment should be made on any Brady bond until they had been fully repaid.
 - **Default risk** is the largest risk in emerging market fixed income securities. Argentina has defaulted on its foreign debts five times in the past 175 years, Brazil seven times and Venezuela nine times.
 - Each of these situations provided great investment opportunities after the default, but may dramatically hurt funds that were holding securities prior to their default.
 - Restructuring after default can be very complex.
 - Ex: Argentina: (December 2001), its foreign debt represented 152 different bonds denominated in seven currencies, governed by eight jurisdictions and held by more than 500000 creditors. Different laws across jurisdictions prevented from a coordinated or decisive fashion to apply sanctions on the Argentinean side.

Hedge Funds Strategies

- Emerging Markets:

- Active approach to sovereign debt restructuring:

- Argentina: Argentina only started negotiating with private bondholders in March 2003, i.e. 15 months after its default. In September 2003, it offered to pay 25 cents on the dollar of the principal value of its debt, with no recognition of past due interest, an unprecedented stand in emerging markets. This represented a 90% reduction in the total value of the bonds and interests. This represented a 90% reduction in the total value of the bonds and interests. The creditor groups, their governments, and the IMF rejected the offer. Bond prices immediately fell to less than 20 cents on the dollar, but several hedge funds were net buyers. They knew Argentina had to settle with foreign bondholders at some point if it ever wanted to return to the sovereign debt market, which was necessary for financing its long-term growth.

- Historical performance:

- 1994-2005, emerging market hedge funds (CS/Tremont Emerging Market Index) delivered an average return of 8.4% p.a. with a volatility of 18.2% (versus 8.5% - 16% for S&P 500), and the MSCI Emerging Market Index (long only) delivered an average return of 2.3% p.a. with a volatility of 26.7%.
 - Emerging market hedge funds performed better than emerging market long-indices, but worse than traditional US equities

Hedge Funds Strategies

- **Global Macro:**

- Investing globally and dynamically allocating capital and attention to the asset class, sector or region where the best opportunities lay.
- Global macro funds have been the most successful and largest category of hedge funds. Their reputation is essentially due to the phenomenal success of a few star managers, such as George Soros, Julian Robertson, Lewis Bacon and Bruce Kovner.
- Today, global macro funds represent only a small percentage of the hedge fund managers' universe
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Hedge Funds Strategies

- **Global Macro:**

- Investment approaches:

- ***Most global macro funds have two typical features:***

- Leveraged bets across a variety of liquid markets to profit from anticipated trends, market biases, or expectations regarding future cyclical or structural changes in specific countries or regions.
 - Focus on structural macroeconomic imbalances and detection of macroeconomic trends. Most global macro funds only invest once markets have swung furthest from equilibrium and get out once the imbalance has been corrected. George Soros once said: “I don’t play the game by a particular set of rules; I look for changes in the rules of the game”.

- ***Three approaches:***

- **Feedback-based** global macro managers focus primarily on understanding market psychology and exploiting the few situations where market participants deviate from rationality. In a few circumstances, market participants may become irrational and market prices may be affected by behavioral biases. They want to be smart trend followers. They usually step-in just as the first signs of a post-crash recovery appear, and step out when a bubble seems likely to burst.
 - **Model-based: sophisticated macroeconomic models.** However, these models must be constantly updated.
 - **Information-based:** systematic data crunchers. Exploiting information asymmetry between micro and macro data.

Hedge Funds Strategies

- **Global Macro:**

- Example of global macro trade: the ERM crisis (1992):

- EMS (European Monetary System) to create monetary stability introduced ECU (European currency unit), an artificial unit of account, constructed as a fixed basket of European currencies.
- Managed-float exchange rate system where the currencies of participating countries were allowed to fluctuate within specified bands.
- Each currency was allowed to fluctuate +/- 2.25% against this central rate. Each central bank had to intervene to make sure its currency remained within the prescribed band (purchase of the currency in the event of a fall vis a vis the central rate, sales in the event of a rise).
- Major weaknesses: First, the ERM effectively turned into a system where fluctuation bands were maintained with respect to the most stable currency of the group, the German mark. Most countries had to hold reserves and intervene when the exchange rate was getting too close to the edge of the band. Second, exchange rate uncertainty was in fact accentuated rather than reduced by the ERM. Indeed, if let say the Bank of Italy decided to expand its money supply, Italian inflation would start rising, interest rates would fall and the lira would depreciate against the German mark. To maintain the exchange rate, the central bank could run out of mark reserves. Then it would have to devalue the currency and adjust the ERM exchange rate.

Hedge Funds Strategies

- **Global Macro:**

- Example of global macro trade: the ERM crisis (1992):
 - German reunification: the German government spent an enormous amount of money and made large fiscal transfers to its eastern region. East German consumers spent most of the transferred money on consumption, fueling domestic demand and creating inflationary pressures. As a result, the Bundesbank had to raise interest rates sharply, which triggered large inflows of foreign funds into the German economy, particularly from ERM currencies like the Italian lira, the Spanish peseta and the British pound, but also from the US as the interest-rate differential surpasses 600 basis points. These inflows brought an appreciation of the mark.
 - In theory, that appreciation should have provoked currency devaluation in other EMS member countries, to regain competitiveness. However, Italy, UK, Ireland, Spain and Portugal were confronted with substantial inflationary pressures accompanied by high unemployment. They decided to maintain the peg. However, speculative pressures increased on the British pound and the Italian lira in 1992.
 - Speculators sold short these two currencies in exchange for US dollars and German marks, hoping to profit from the difference between the exchange rate before and after a possible devaluation.

Hedge Funds Strategies

- **Global Macro:**

- Example of global macro trade: the ERM crisis (1992):
 - The Bank of England initially attempted to support its currency by selling US dollars and German marks and buying pounds, but its foreign currency reserves, which had amounted to \$40 billion at the beginning of 1992, dried up rapidly.
 - This put further pressure on the pound and encouraged more speculators to play the devaluation theme.
 - On 16 September 1992, additional massive short selling of the pound forced the Bank of England to raise rates to 12% to 15%.
 - The British government finally decided to let the pound float and suspended Britain's membership of the ERM.

Hedge Funds Strategies

- **Global Macro:**

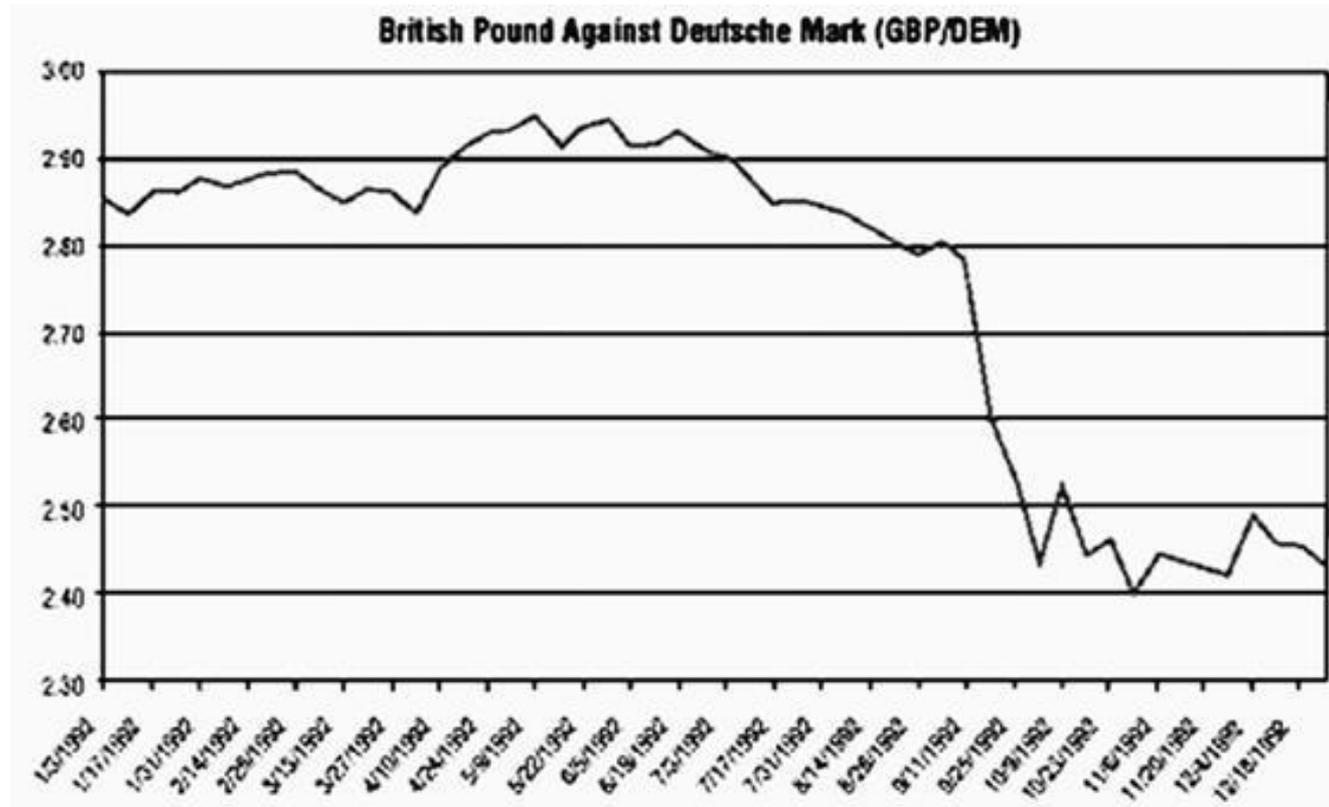
- Example of global macro trade: the ERM crisis (1992):



Hedge Funds Strategies

- **Global Macro:**

- Example of global macro trade: the ERM crisis (1992):



Measuring Risks, Return and Performance

- **Measuring Net Asset Values and Returns:**

- Importance to assess past performance
- Past performance is not a guarantee of future performance but understanding what happened in the past is likely to be a guide in formulating expectations about the future
- Lack of transparency / not allowed to advertise or solicit money from the general public
- The next step of risk transparency is the standardization of risk factors, so that the risk exposures can be aggregated across an investor's portfolio of hedge funds.
- Value at Risk in particular has been used by both investors and managers in analyzing their portfolios and provided a common language for risk communication.

VAR and Risk Management

▪ Risk Management:

- Financial institutions need (such as any other business) to manage their exposure to risk:
 - **Market risk**
 - **Credit risk**
 - **FX risk**
 - **Volatility risk**
 - **Liquidity risk**
 - **Inflation risk**
 - **Operational risk**

▪ Methodology:

- Identify the sources of risk
- Measuring and monitoring those risks
- Addressing the risks
- Banks can use both a quantitative and qualitative approach to managing risk
- Basel are one set of guidelines to manage risks. Banks can also use hedging mechanisms and other financial instruments to reduce their risk

▪ Principles:

- A project should be undertaken if it is likely that it will increase shareholder's value
- Hedging tools work because financial markets are not perfect: there are many opportunities to create value by using financial risk management

VAR and Risk Management

- Market risk:

- Definition: risk of losses arising from the movement in market prices
- Equity risk: risk that stock prices or their implied volatility will change
- Implied volatility:
 - Differs from historical volatility (backward looking measure: historical volatility is calculated from known past returns of a security)
 - It is a forward looking measure
 - The implied volatility is the value of the volatility of the underlying instrument which, when input in an option pricing model will return a theoretical value equal to the current market price of the option
 - A higher volatility results in a higher theoretical value of the option
 - It is an inverse function: we talk about the value of the volatility implied by the market price of the option
- Other types of market risk:
 - **Interest rate risk (LIBOR, EURIBOR)**
 - **Currency risk**
 - **Commodity risk**

VAR and Risk Management

- Measuring Market Risk: Value-At-Risk

- Value-at-Risk is a short term risk management practice

- *Definition:*

For a given portfolio, time horizon and probability p , the p -VaR is defined as a threshold value, such that the probability that the loss on the portfolio over the given time horizon exceeds this value is p , assuming mark-to-market pricing (fair value: values on the balance sheet change as market conditions change; different from historical cost accounting which does not represent current market value and summarizes past transactions instead)

- *Limiting assumptions of Value-At-Risk that constrain its accuracy:*

The composition of the portfolio measured is unchanged over the specified period which is fine for short-term horizons but not realistic for longer-term horizons as over time, many of the positions within a portfolio may have changed

- *Three methods to measure the VAR:*

- ✓ Historical simulation
- ✓ Variance-covariance matrices
- ✓ Monte-Carlo simulation
- ✓ Limiting assumptions: the first two approaches assume that historical correlations are stable and will not change in the future or under times of market stress

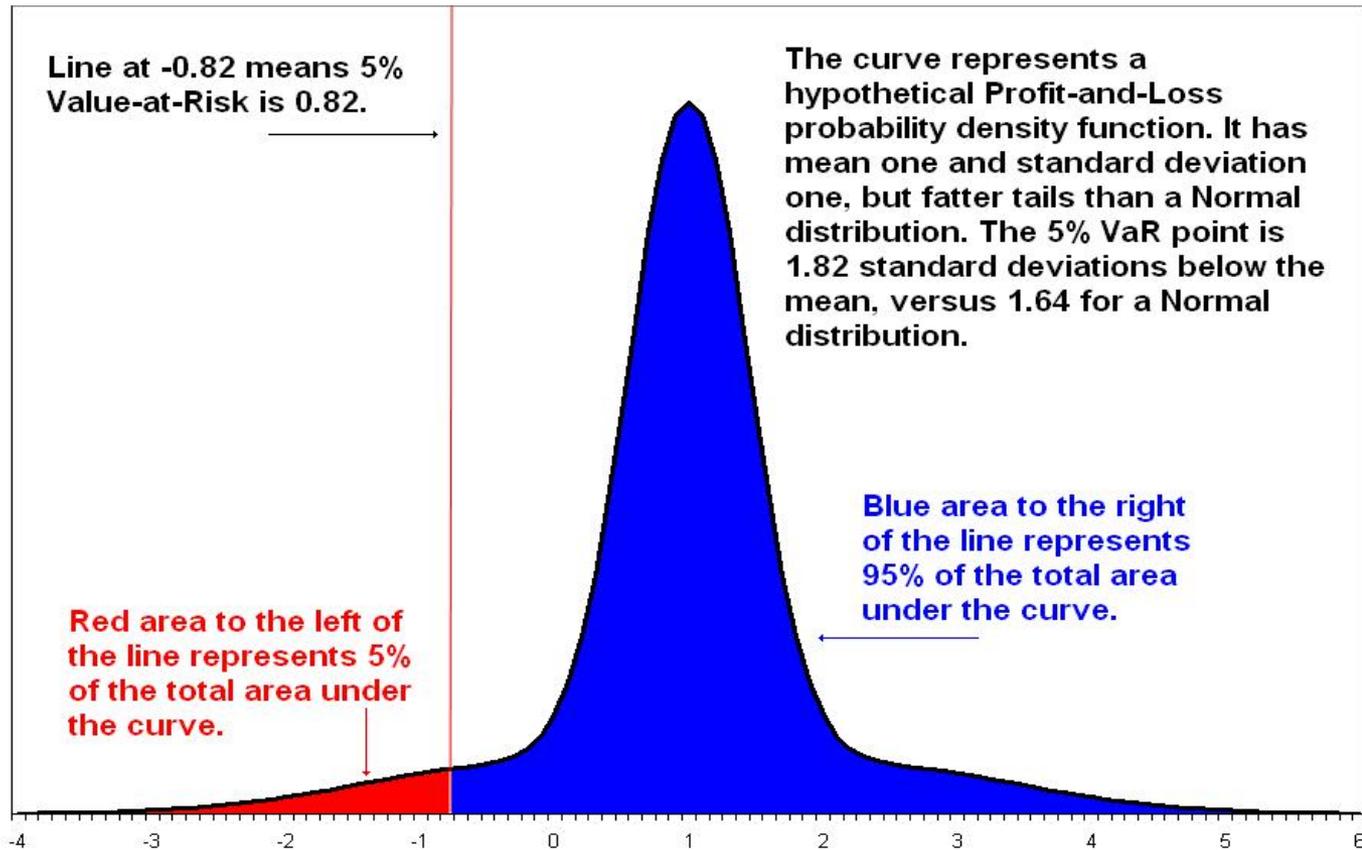
VAR and Risk Management

- Measuring Market Risk: Value-At-Risk

- *Example:* If a portfolio of stocks has a one-day 5% VAR of 1 million USD, there is a 0.05 probability that the portfolio will fall in value by more than 1 million USD over a one day if there is no trading. Informally, a loss of \$1 million or more on this portfolio is expected on 1 day out of 20 days.
- *Usage of VAR:*
 - Risk management
 - Financial control
 - Financial reporting
 - Computing regulatory capital
 - Economic capital
- *Notion of Back-testing:*
 - Testing a predictive model using existing historic data: cross validation applied to time-series data
 - Estimating the performance of a strategy if it had been employed during a past period
 - Limitation of back-testing: need for detailed historical data

VAR and Risk Management

- Measuring Market Risk: Value-At-Risk:



VAR and Risk Management

- **Measuring Market Risk: Value-At-Risk: Historical Simulation**

85% of large banks use historical simulation



VAR and Risk Management

- Measuring Market Risk: Value-At-Risk: Historical Simulation

- It is a procedure for predicting the value at risk by simulating or constructing the cumulative distribution function of assets returns over time.
- Unlike parametric VAR models, historical simulation does not assume a particular distribution of the asset returns.
- *Shortcomings:*
 - Assumes that asset returns are independent and identically-distributed random variables
 - Historical simulation applies equal weight to all returns of the whole period
 - It assumes that history will repeat itself from a risk perspective
- The red bars in the previous diagram represent the lowest 5% of all daily returns (the left tail)
- We can say with 95% confidence that the worst daily loss will not exceed 4%
- Put another way: we expect with 95% confidence that the return will be above -4%

VAR and Risk Management

- Measuring Market Risk: Value-At-Risk: Variance-Covariance matrices



VAR and Risk Management

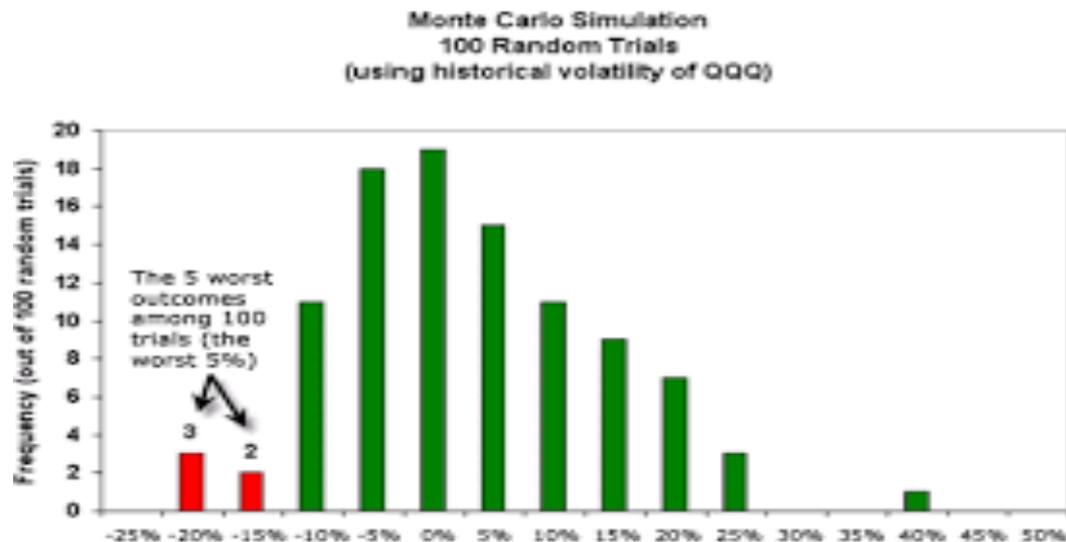
- Measuring Market Risk: Value-At-Risk: Variance-Covariance matrices

- This method assumes that stock returns are normally distributed. In other words it requires that we estimate only two factors: an expected or average return and a standard deviation, which allows to plot a normal distribution curve.
- In the figure of the previous slide, we plot the normal curve against the same actual return data
- The idea behind the variance-covariance is similar to the idea behind the historical method except that we use the familiar curve instead of actual data
- The advantage of the normal curve is that we automatically know where the worst 5% and 1% lie on the curve. They are a function of our desired confidence and the standard deviation (σ)
- 95% (high) corresponds to a distance which is -1.65σ
- The blue curve is based on the actual daily standard deviation of the asset, which let say is 2.64%. If we assume an average return of 0%, the results of plugging the actual standard deviation into the formula above gives:
- 95% : $-1.65 * 2.64\% = -4.36\%$
- This is the daily VAR at a 95% confidence level

VAR and Risk Management

▪ Measuring Market Risk: Value-At-Risk: Monte-Carlo Simulation

- The third method involves developing a model for future stock price returns and running multiple hypothetical trials through the model. A Monte Carlo simulation refers to any method that randomly generates trials, but by itself does not tell us anything about the underlying methodology.
- For most users, a MC simulation amounts to a black box generator of random outcomes.
- Below is the result arranged in a histogram:



VAR and Risk Management

- Measuring Market Risk: Value-At-Risk: Monte-Carlo Simulation

- To summarize, we ran 100 hypothetical trials of monthly returns for the stock. Among them, two outcomes were between -15% and -20%; and there were between -20% and -25%. That means the worst five outcomes (that is the worst 5%) were less than -15%.
- The MC simulation therefore leads to the following VAR-type conclusion:
 - With 95% confidence, we do not expect to lose more than 15% during any given month.

VAR and Risk Management

- Stress Testing: What is it?

- Ability of a financial instrument or financial institution to deal with an economic crisis
- Scenario analysis:
 - What if ? unemployment rate rises to
 - What if ? Equity markets crash by
 - What happens if GDP falls by
 - What happens if interest rates go up by
 - What if half the instruments in the portfolio terminate their contracts in the fifth year
 - What happens if oil prices rise by
- Regulatory requirements: ensure adequate capital allocation to cover potential losses incurred during extreme but plausible scenarios (risk adjusted determination of capital)
- Stress testing should allow for the combination of different events
- It tests the ability of a current exposure to a known historical scenario
- In 2014, 25 banks failed in stress tests conducted by the EBA (European Banking Authority)

VAR and Risk Management

- **Stress Testing: Bank stress test**

- Simulation based on an examination of the balance sheet
- In 2007, governmental regulatory bodies became interested in conducting their own stress tests
- US : twice a year, one internal, one by regulator
- Dodd Frank Act stress testing (starting 2014 for mid-sized firms, those with 10 to 50 billion USD in assets)
- Stress testing as a means to identify and quantify loan portfolio risk

Measuring Returns

- Incentive fees are typically calculated as a percentage of the annual or semi-annual increase in the gross asset value of the fund, either as a straight percentage of the appreciation or as a percentage of the increase over a certain threshold (hurdle rate).
- NAV: net-asset-value: can be tricky to measure and evaluate in a fair way

Summary: The benefits of hedge funds investing (could we illustrate this?)

- Superior historical risk/reward trade-off
- Low correlation to traditional assets
- Negative vs positive market environments

Financial Modelling Best Practices

- Knowledge of Excel/VBA is essential for a career in finance as modeling skills are in high demand especially in the asset management and alternative investment world
- A good financial model should show key assumptions clearly whereby the user can change the numbers in the corresponding cells to see the impact on financials.
- Scenario analysis: worst, base and best-case scenario (ability to play around with a number of key assumptions)
- The model needs to have have the following characteristics:
 - It needs to be predictive
 - The key economic drivers are separated, clear and measurable
 - The financial modeler needs to have confidence in the economic drivers that are used: understand which of your economic drivers are hypotheses (low confidence estimates) versus which are well understood (completely calibrated drivers). You can do some sensitivity analysis on the drivers that are hypotheses so that you can better understand the possible range of your future economic performance
 - Sensitivity analysis particularly for the drivers that you are less confident in, so that you can see the range of possible outcomes going forward
 - The spreadsheet model can be evaluated with real-world questions
 - The spreadsheet model should be easy to understand and as simple as possible