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# Financial Markets & Risk

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## A closer look at the different asset classes

- Stocks
- Bonds
- Money market instruments
- Alternative investments

# A closer look at the different asset classes

## What is an Investment?

- Commitment of funds to assets that will be held over the future time period.
- Real assets vs. financial assets
  - Real assets are physical, tangible assets such as gold or real estate
  - Financial assets are paper (electronic) claims on some issuer (e.g. corporation or government)
  - Type of financial assets investors are mainly interested in are marketable securities
- Investment refers in general to financial assets and in particular to marketable securities.
  - Marketable securities are financial assets that are easily traded on the organized exchanges
  - Impersonal trading

# Why Do We Invest?

The purpose is to increase one's wealth

- Wealth = current income or funds + present value of all income in the future
- We are concerned with monetary wealth

Get a return on the money, do not hold cash

- Opportunity cost
- Inflation
- Purchasing power diminishes

Protect yourself from inflation, taxes, etc. and **MAKE MONEY!!!**



# One Classification of Financial Assets

## Assets with random cashflows:

- **Equity** (share, common stock)
- Type of financial asset that **enables the holder to receive** dividend payments, after creditors and preference shareholders are paid, and any capital gain (loss) that may arise at the disposal of the asset.
- Equity holders are **residual claimants** of a company
- **Shares are irredeemable**, thus having an indefinite life
- A share represents the **unit of ownership** in the company
- **Not known** if investor will receive dividend, as dividends are paid out of earnings

## Assets with known cashflows

- Fixed income securities (Money Market Instruments, Bonds)
- Characteristics: coupon rate, principal amount, time to maturity
- Bond is a promise made by a bond issuer to make regular coupon payments and repay a principal amount at the maturity date to the bondholder.
- A failure to fulfill that promise results in a default of a bond

## Assets with contingent cashflows

- Derivative securities: forwards, futures, options and swaps
- Cashflows are dependent on the price movements of the underlying assets

# Asset classes and subcategories

Equities	Fixed Income	Cash	Alternative Assets
<b>UK Equities</b> <ul style="list-style-type: none"> <li>- Large capitalisation</li> <li>- Mid capitalisation</li> <li>- Small capitalisation</li> <li>- Micro capitalisation</li> <li>- Growth</li> <li>- Value</li> <li>- Blend (Value and Growth)</li> <li>- Preference shares</li> <li>- Options and futures</li> </ul> <b>Other Developed Markets</b> <ul style="list-style-type: none"> <li>- North America</li> <li>- Europe</li> <li>- Japan</li> <li>- Options and futures</li> </ul> <b>Emerging Markets</b> <ul style="list-style-type: none"> <li>- Africa</li> <li>- Asia ex Japan</li> <li>- Emerging Europe</li> <li>- Latin America</li> <li>- Middle East</li> <li>- Options and futures</li> </ul>	<b>UK Fixed Income</b> <ul style="list-style-type: none"> <li>- UK Treasury bonds</li> <li>- Municipal</li> <li>- Corporate</li> <li>- Mortgage-backed</li> <li>- Asset-backed</li> <li>- Options and futures</li> </ul> <b>High Yield</b> <b>Convertible Securities</b> <b>Other Developed Markets</b> <ul style="list-style-type: none"> <li>- North America</li> <li>- Europe</li> <li>- Japan</li> <li>- Options and futures</li> <li>- Interest rate swaps</li> </ul> <b>Emerging Markets</b> <ul style="list-style-type: none"> <li>- Africa</li> <li>- Asia ex Japan</li> <li>- Emerging Europe</li> <li>- Latin America</li> <li>- Middle East</li> <li>- Options and futures</li> </ul>	<b>Cash</b> <ul style="list-style-type: none"> <li>- Physical holdings</li> <li>- Bank balance</li> <li>- UK Treasury bills</li> <li>- Municipal notes</li> <li>- Commercial papers</li> <li>- Certificates of deposit</li> <li>- Repurchase agreement</li> <li>- Banker acceptances</li> <li>- Non UK instruments</li> </ul>	<b>Commodities</b> <ul style="list-style-type: none"> <li>- Commodity trading advisors (CTAs)</li> <li>- Physicals: Agricultural, metal and oil</li> <li>- Options and futures</li> </ul> <b>Hedge Funds</b> <ul style="list-style-type: none"> <li>- Event driven</li> <li>- Relative value</li> <li>- Market neutral</li> <li>- Long - short</li> <li>- Global macro</li> </ul> <b>Private Equity</b> <ul style="list-style-type: none"> <li>- Leveraged Buyouts</li> <li>- Venture Capital</li> <li>- Non UK</li> </ul> <b>Real Estate</b> <ul style="list-style-type: none"> <li>- Residential</li> <li>- Commercial</li> <li>- REITs (Real Estate Investment Trusts)</li> </ul> <b>Art</b>

## UK Equity

Rationale	Risks and Concerns
Ownership claim	Residual Claim
High returns	High Standard Deviation
Rational Pricing (Efficient market place)	Long Term Cycles
Sector / Style Potential	

## UK Fixed Income

Rationale for Investment	Risks and Concerns
Senior claim	Lower returns than equity
Low risk	Interest rate risk
Higher return than cash	Inflation risk
Portfolio diversifier (Low correlation)	Credit risk
	Reinvestment risk
	Prepayment risk (Callable)

## Non UK equity and fixed income (including emerging markets)

Rationale for Investment	Risks and Concerns
Larger opportunity set	High standard deviation
Higher return potential	Rising and unstable correlations
Portfolio diversifier (Low correlation with UK)	High investment costs
Irrational (Inefficient) pricing: Possibility to beat the market	Currency risk
	Political risk
	Liquidity risk

## High yield fixed income

Rationale for Investment	Risks and Concerns
High return	Issued to finance leveraged buyouts or ex-investment grade bond consequently downgraded
Lower risk than equity	Credit risk
Irrational (Inefficient) pricing: Possibility to beat the market	Liquidity risk
Claim senior to equity	

# Convertible preference shares and convertible bonds

Rationale for Investment	Risks and Concerns
Equity-debt hybrid	Prepayment risk (Callable)
Claim senior to equity	Claim junior to bond
Portfolio diversifier (Low correlation with bonds)	Complicated valuation



## Cash equivalents

Rationale for Investment	Risks and Concerns
Safe heaven in periods of negative financial returns	Low return
Low standard deviation	Reinvestment risk
Portfolio diversifier (Low correlation)	Inflation risk
High liquidity	Credit exposure
	Costs and attention

## Alternative investments: Commodities

Rationale for Investment	Risks and Concerns
Portfolio diversifier (Low correlation)	High standard deviation (Commodity Trading Advisers, CTAs)
Inflation hedge	Poor performance in periods of low inflation
Intrinsic utility	Illiquid assets
	Storage costs

## Alternative investments: Hedge Funds

Rationale for Investment	Risks and Concerns
Possibility to beat the market (Alpha potential)	Fund collapse: Long-Term Capital Management (LTCM)
Broad opportunity set	Return measurement ambiguous
Portfolio diversifier (Low correlation)	High annual and performance fees

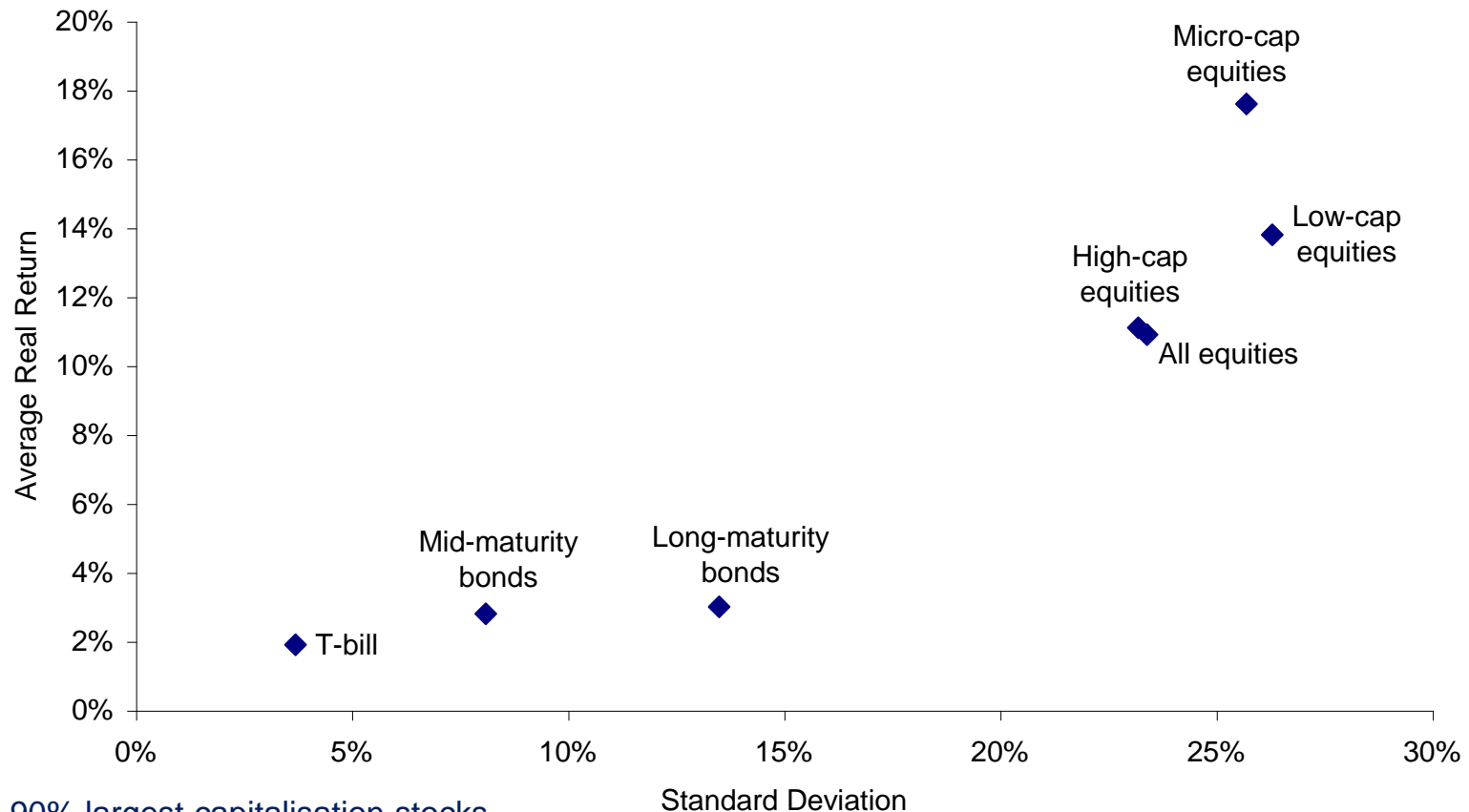
## Alternative investments: Private Equity

Rationale for Investment	Risks and Concerns
High returns	Irregular cash flows
Portfolio diversifier (Low correlation) Irrational (Inefficient) pricing: Possibility to beat the market	High standard deviation
	Returns measurement

## Alternative investments: Real Estate

Rationale for Investment	Risks and Concerns
<ul style="list-style-type: none"><li>Inflation hedge</li><li>Higher return than bonds</li><li>Low standard deviation</li><li>Portfolio diversifier (Low correlation)</li><li>Irrational (Inefficient) pricing: Possibility to beat the market</li></ul>	<ul style="list-style-type: none"><li>Poor performance in periods of low inflation</li><li>Bubble price movement: (REITs share price <math>\neq</math> Net asset value)</li><li>Liquidity risk</li></ul>

# UK financial market real returns and risks: 1955 – 2000



High cap: 90% largest capitalisation stocks

Low cap: Next 9% largest stocks

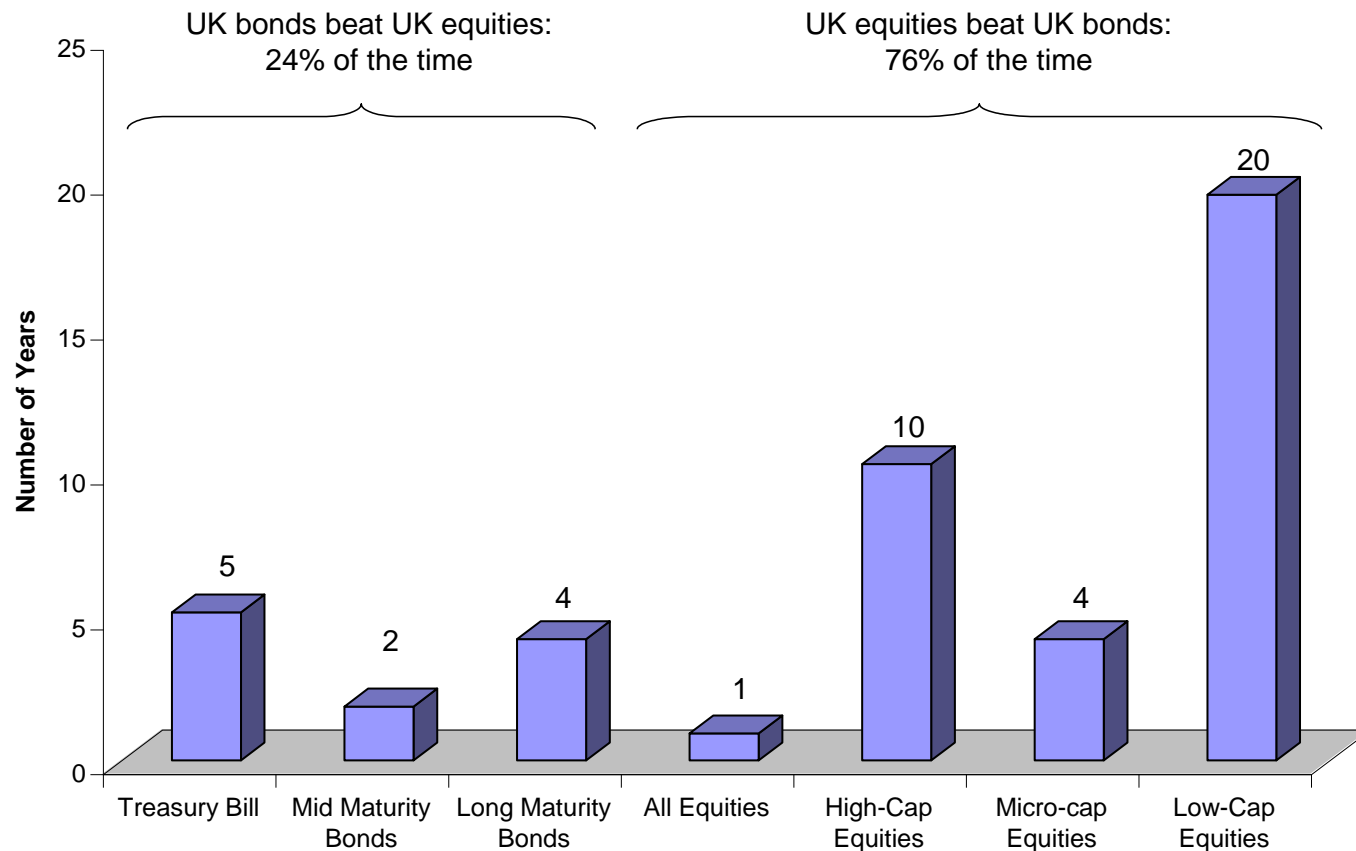
Micro cap: 1% smallest stocks

Market capitalisation = Number of stocks \* Share price

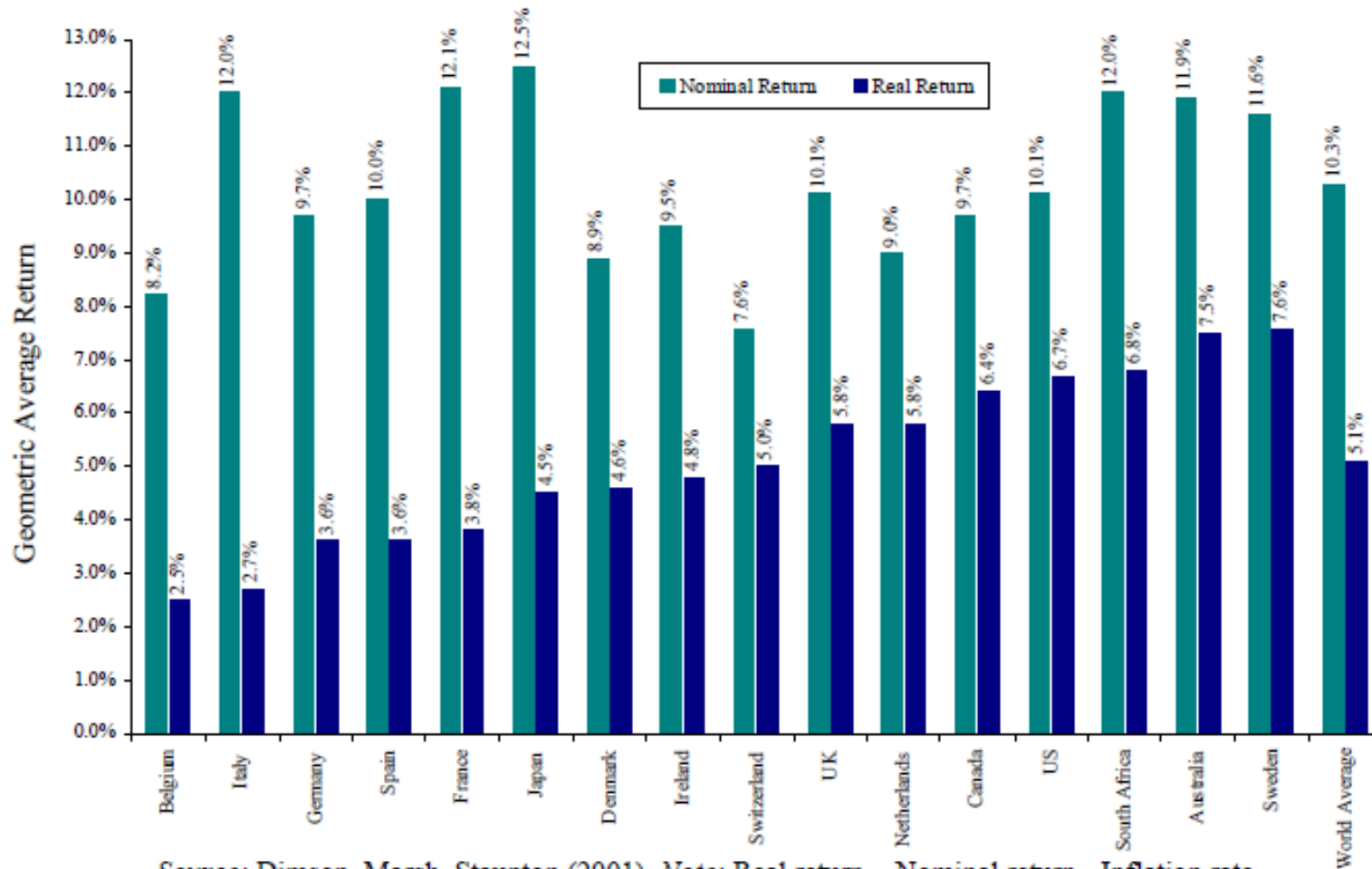
Source: Dimson and Marsh, 2001

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# Number of years each UK asset class performed the best (1955 – 2000)



# Nominal and Real Equity Returns: 1900 - 2000



Source: Dimson, Marsh, Staunton (2001). Note: Real return  $\approx$  Nominal return - Inflation rate



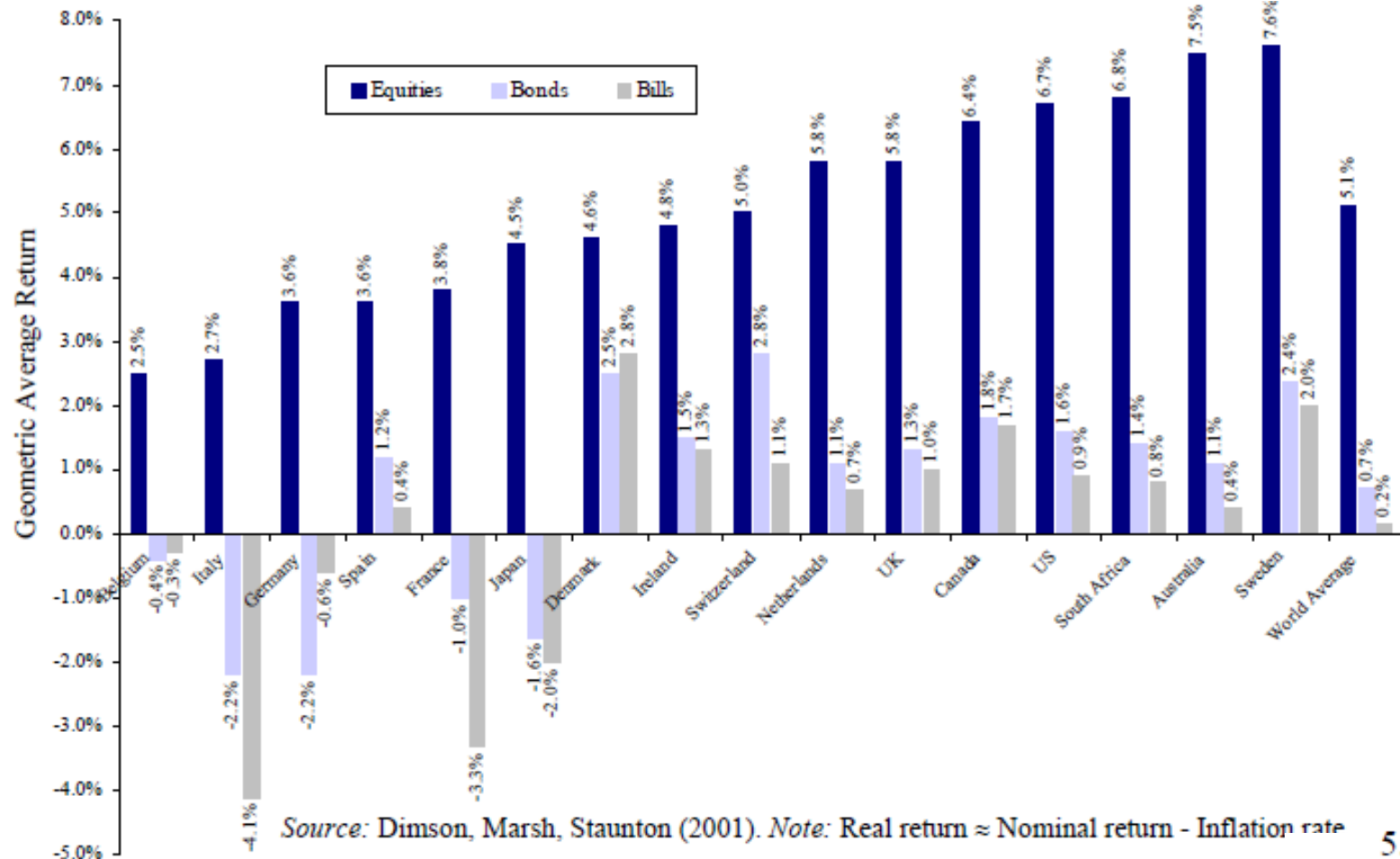
# Real Equity Returns Around the World: 1900 - 2000

Country	Geometric Mean (%)	Arithmetic Mean (%)	Standard Deviation (%)	Minimum Return (%)	Minimum Year	Maximum Return (%)	Maximum Year
Australia	7.5	9.0	17.7	-34.2	1974	53.5	1983
Belgium	2.5	4.8	22.8	-40.9	1947	100.5	1940
Canada	6.4	7.7	16.8	-32.0	1974	55.2	1933
Denmark	4.6	6.2	20.1	-28.4	1974	106.1	1983
France	3.8	6.3	23.1	-37.5	1947	66.1	1954
Germany	3.6	8.8	32.3	-89.6	1948	155.9	1949
Ireland	4.8	7.0	22.2	-54.3	1974	69.9	1977
Italy	2.7	6.8	29.4	-72.9	1945	120.7	1946
Japan	4.5	9.3	30.3	-84.0	1946	119.6	1952
Netherlands	5.8	7.7	21.0	-34.9	1941	101.6	1940
South Africa	6.8	9.1	22.8	-52.2	1920	102.9	1933
Spain	3.6	5.8	22.0	-43.3	1977	98.9	1986
Sweden	7.6	9.9	22.8	-43.0	1918	89.5	1905
Switzerland*	5.0	6.9	20.4	-37.8	1974	56.2	1985
United Kingdom	5.8	7.6	20.0	-57.1	1974	96.7	1975
United States	6.7	8.7	20.2	-38.0	1931	56.8	1933

\* Swiss equities are from 1911.

Source: Dimson, Marsh, Staunton (2001). Note: Real return  $\approx$  Nominal return - Inflation rate

# Real Returns on Major Asset Classes: 1900 - 2000



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# Real Returns on Major Asset Classes: 1900 - 2000

Country	Equities (%)		Bonds (%)		Bills (%)	
	Arithmetic Mean	Standard Deviation	Arithmetic Mean	Standard Deviation	Arithmetic Mean	Standard Deviation
Australia	9.0	17.7	1.9	13.0	0.6	5.6
Belgium	4.8	22.8	0.3	12.1	0.0	8.2
Canada	7.7	16.8	2.4	10.6	1.8	5.1
Denmark	6.2	20.1	3.3	12.5	3.0	6.4
France	6.3	23.1	0.1	14.4	-2.6	11.4
Germany*	8.8	32.3	0.3	15.9	0.1	10.6
Ireland	7.0	22.2	2.4	13.3	1.4	6.0
Italy	6.8	29.4	-0.8	14.4	-2.9	12.0
Japan	9.3	30.3	1.3	20.9	-0.3	14.5
The Netherlands	7.7	21.0	1.5	9.4	0.8	5.2
South Africa	9.1	22.8	1.9	10.6	1.0	6.4
Spain	5.8	22.0	1.9	12.0	0.6	6.1
Sweden	9.9	22.8	3.1	12.7	2.2	6.8
Switzerland**	6.9	20.4	3.1	8.0	1.2	6.2
United Kingdom	7.6	20.0	2.3	14.5	1.2	6.6
United States	8.7	20.2	2.1	10.0	1.0	4.7

\*Bond and bill statistics for Germany exclude the years 1922-23.

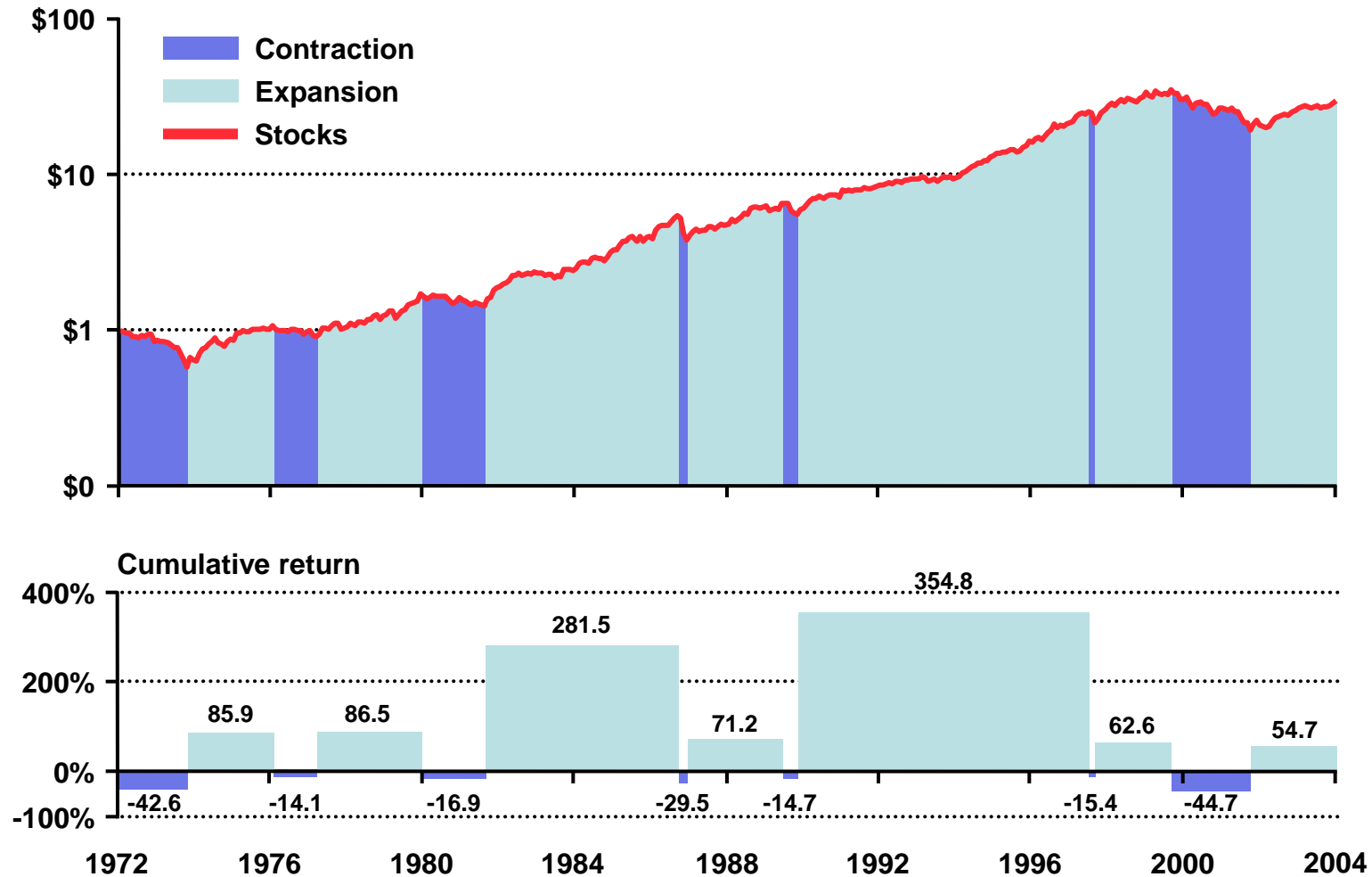
\*\* Swiss equities are from 1911.

Source: Dimson, Marsh, Staunton (2001). Note: Real return  $\approx$  Nominal return - Inflation rate


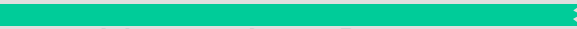

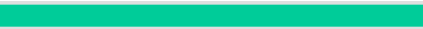























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# Stock market contractions and expansions

1972–2004

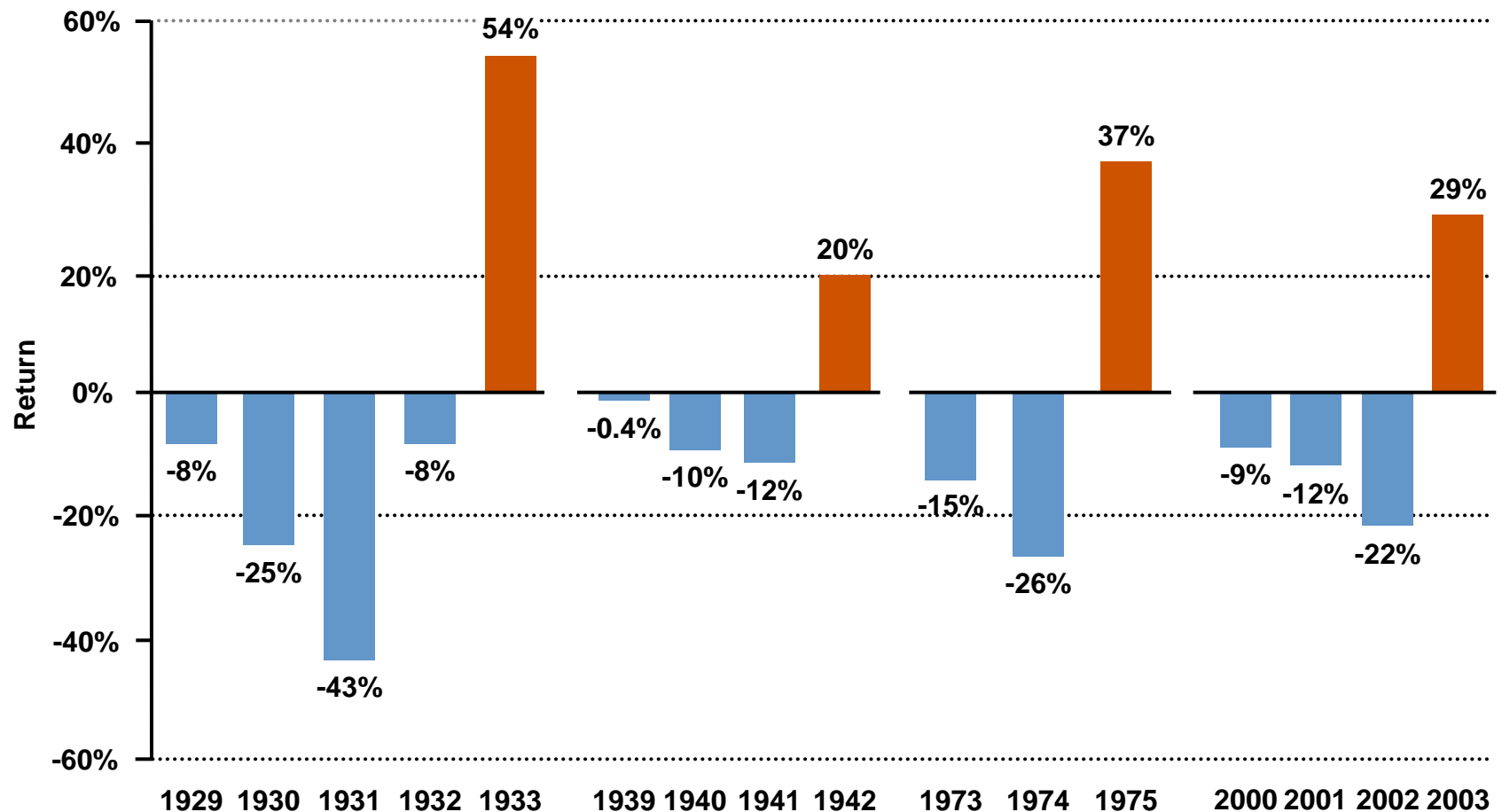


# Market downturns and recoveries

1926–2004		Downturn		Recovery	
34 months	-83.4%		Sept 1929 – June 1932		151 months
6 months	-21.8%		June 1946 – Nov 1946		35 months
7 months	-10.2%		Aug 1956 – Feb 1957		5 months
5 months	-15.0%		Aug 1957 – Dec 1957		7 months
6 months	-22.3%		Jan 1962 – June 1962		10 months
8 months	-15.6%		Feb 1966 – Sept 1966		6 months
19 months	-29.3%		Dec 1968 – June 1970		9 months
21 months	-42.6%		Jan 1973 – Sept 1974		21 months
14 months	-14.1%		Jan 1977 – Feb 1978		5 months
20 months	-16.9%		Dec 1980 – July 1982		3 months
3 months	-29.5%		Sept 1987 – Nov 1987		18 months
5 months	-14.7%		June 1990 – Oct 1990		4 months
2 months	-15.4%		July 1998 – Aug 1998		3 months
25 months	-44.7%		Sept 2000 – Sept 2002		

# Periods of consecutive negative stock returns

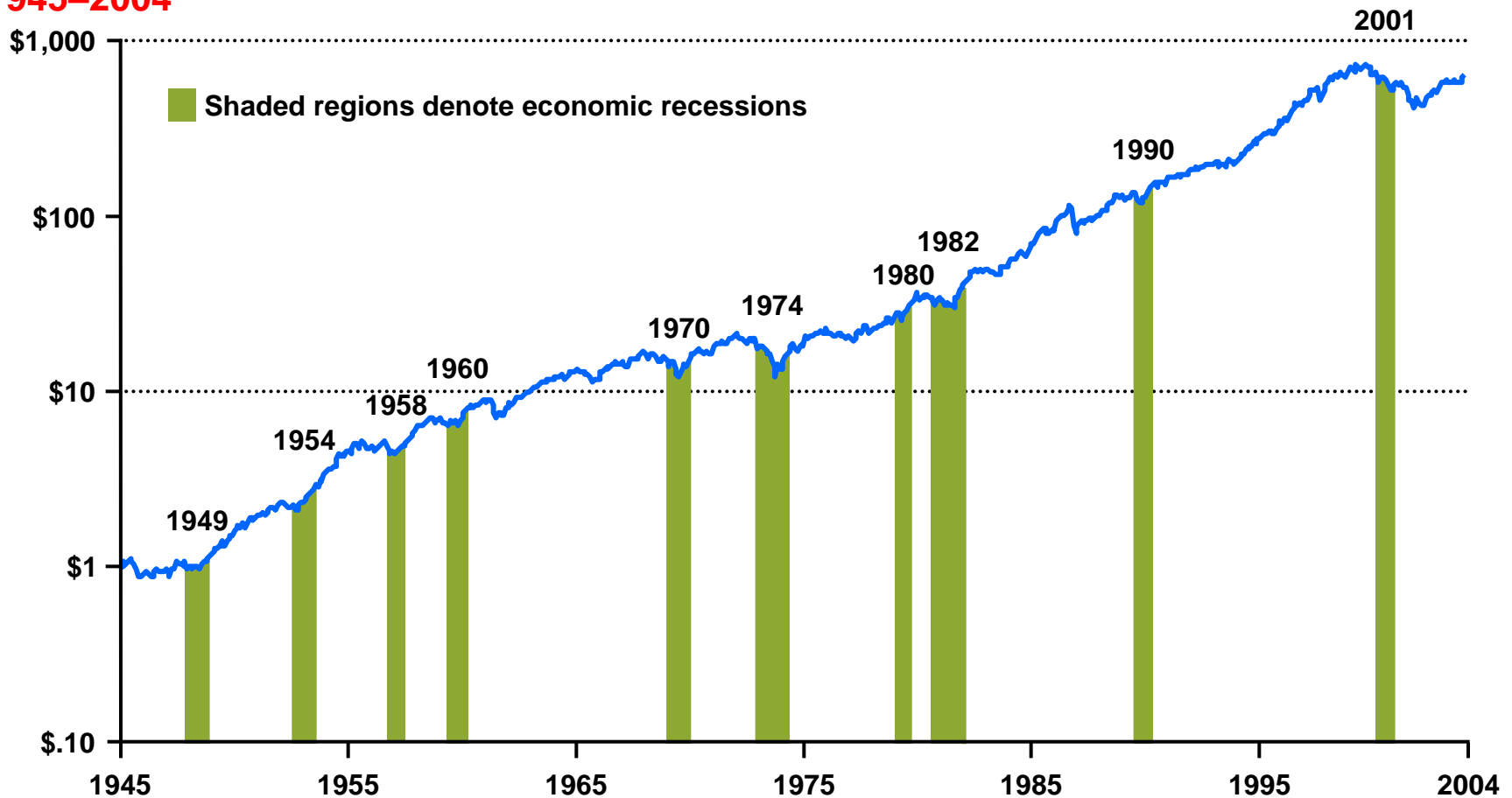
1926–2004



Average stock market return is 10.4%.

# Stock performance during recessions

1945–2004

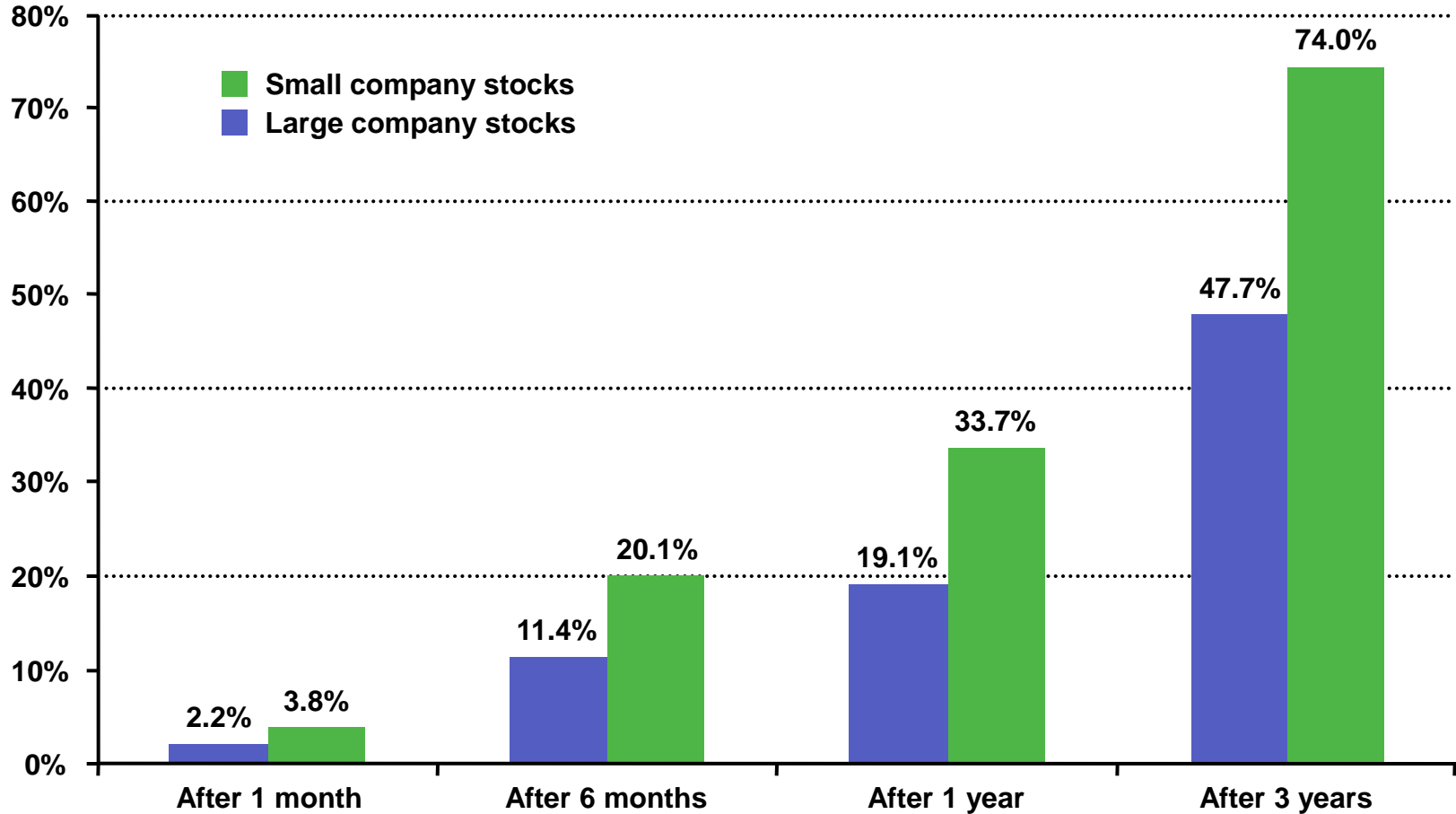


Hypothetical value of \$1 invested at year-end 1945. Assumes reinvestment of income and no transaction costs or taxes.

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# Stock performance after recessions

1945–2004



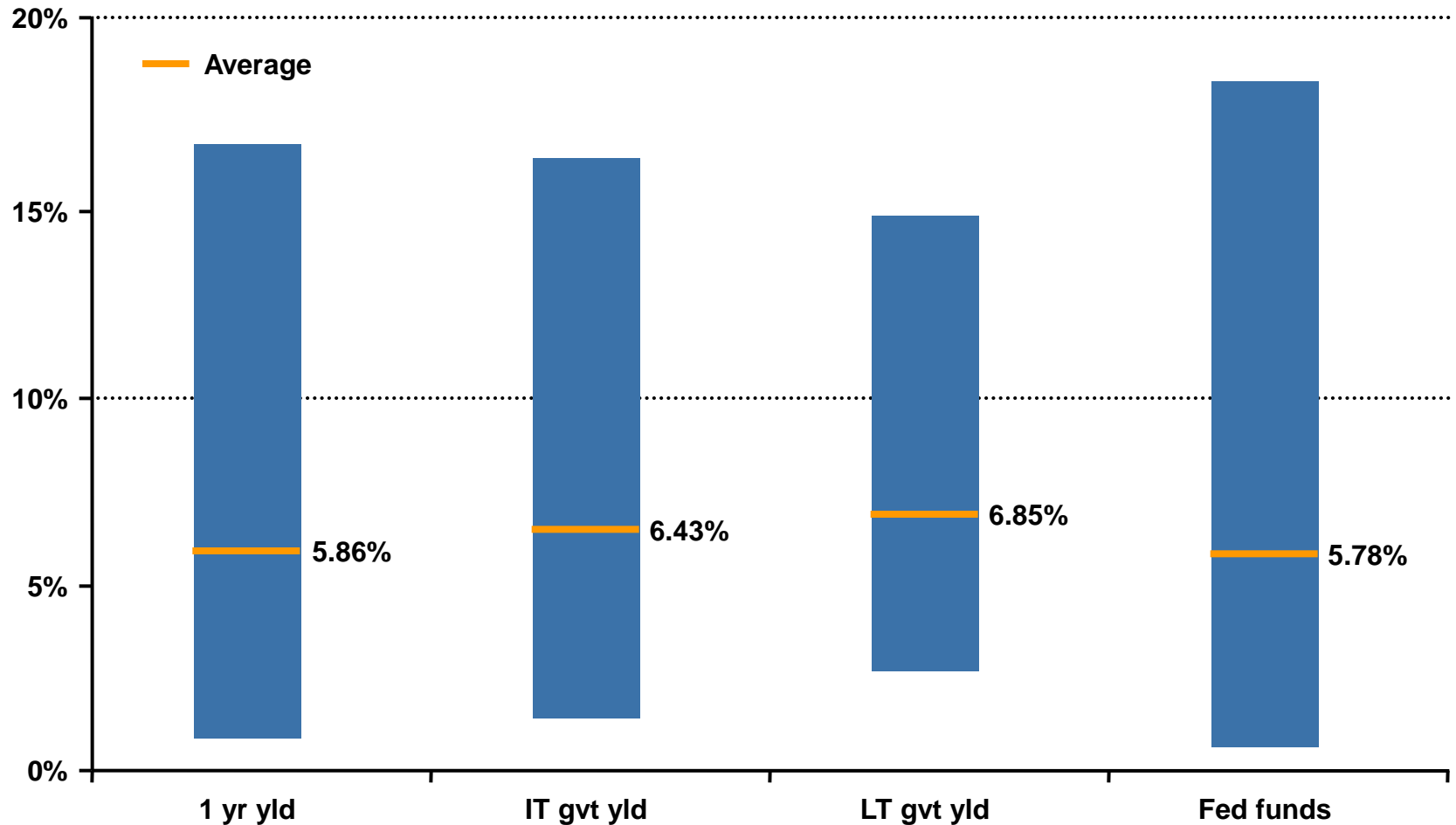
Cumulative returns of large and small stocks after recessions 1945–2004

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# History of interest rates

July 1954–December 2004

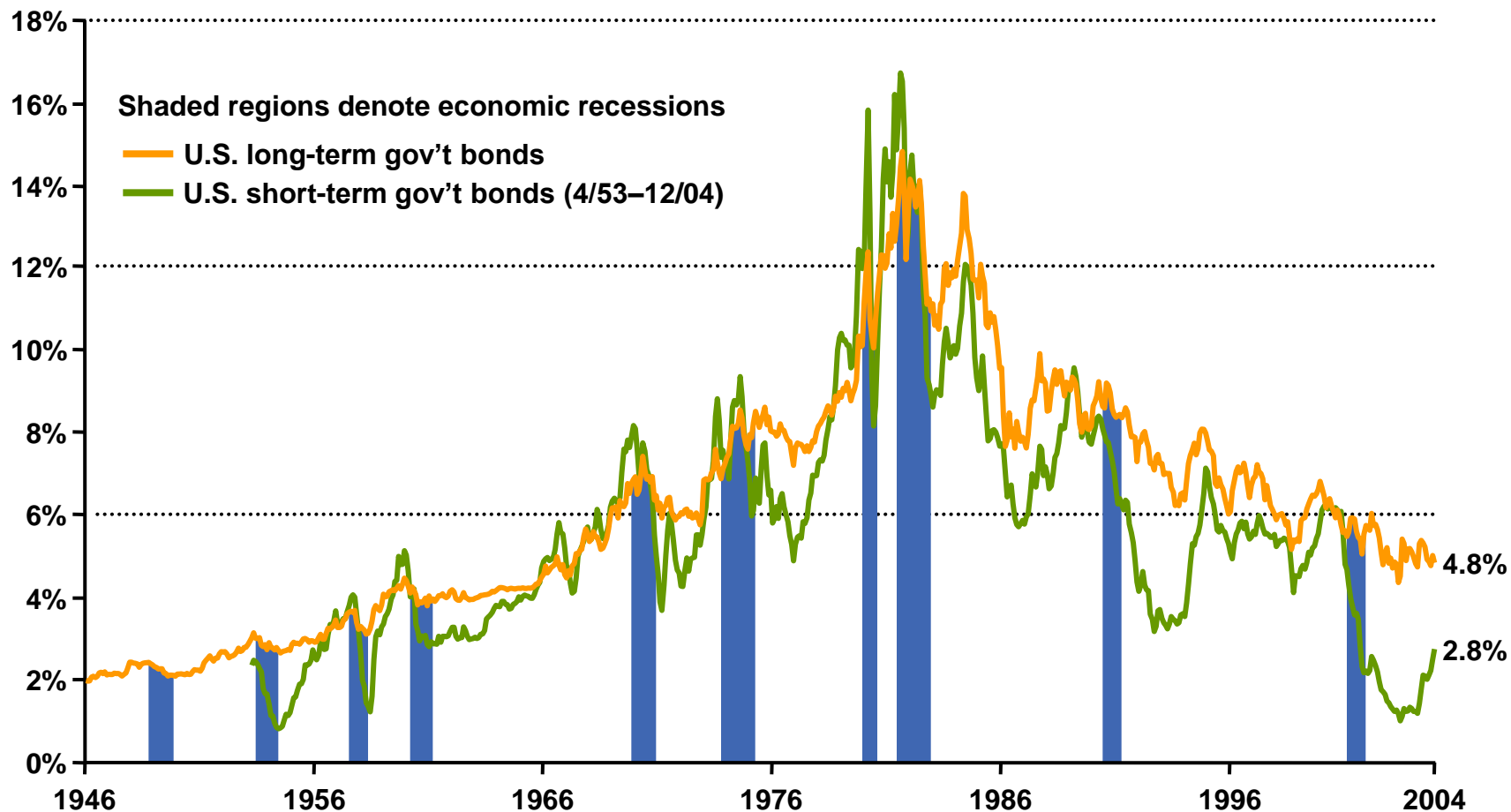


Each bar shows the range of yield for each bond over the time period July 1954 to December 2004.

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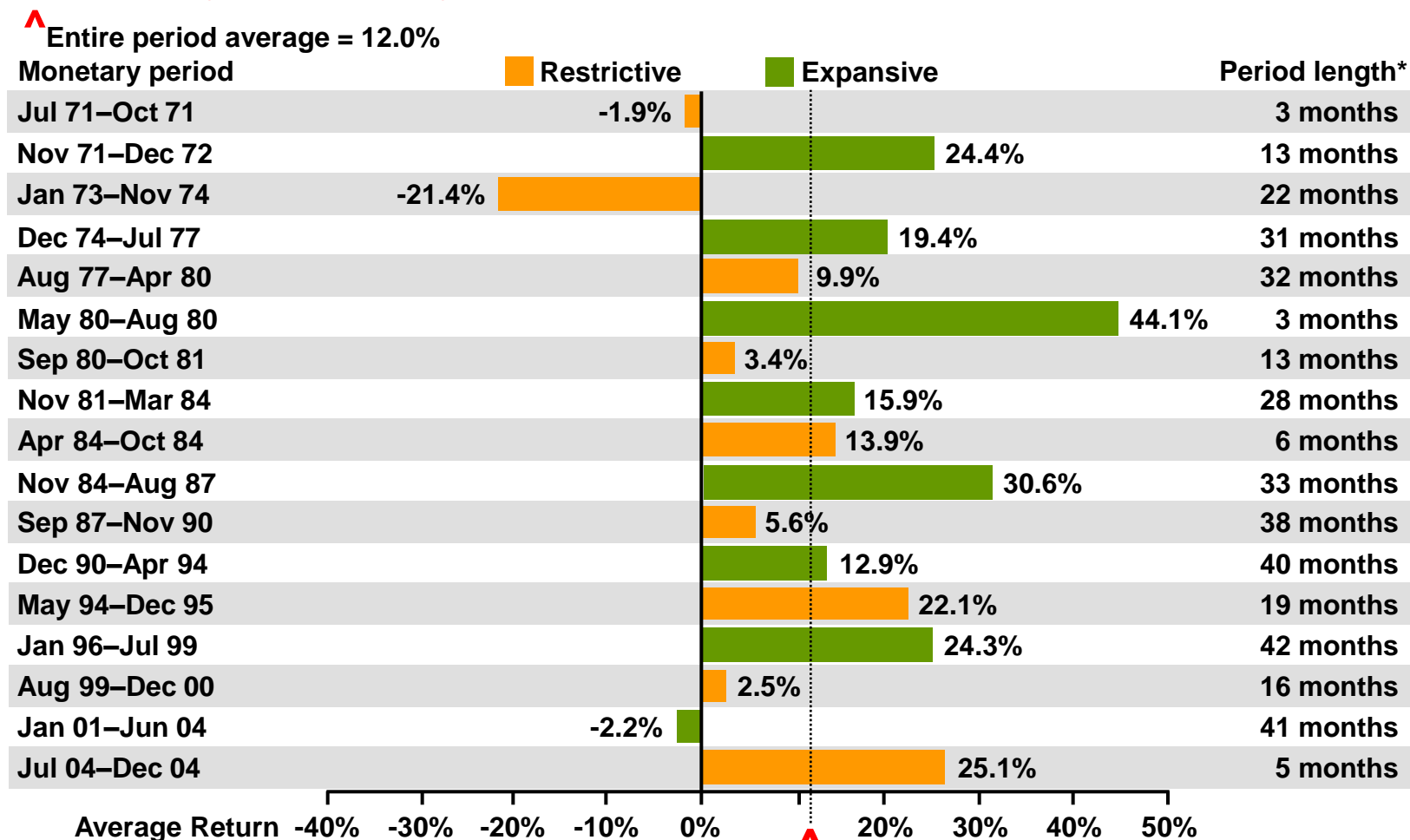
# Bond yields during recessions 1946–2004

January 1946 through December 2004



# Stock returns and monetary policy

Annualized monthly returns, July 1971–December 2004

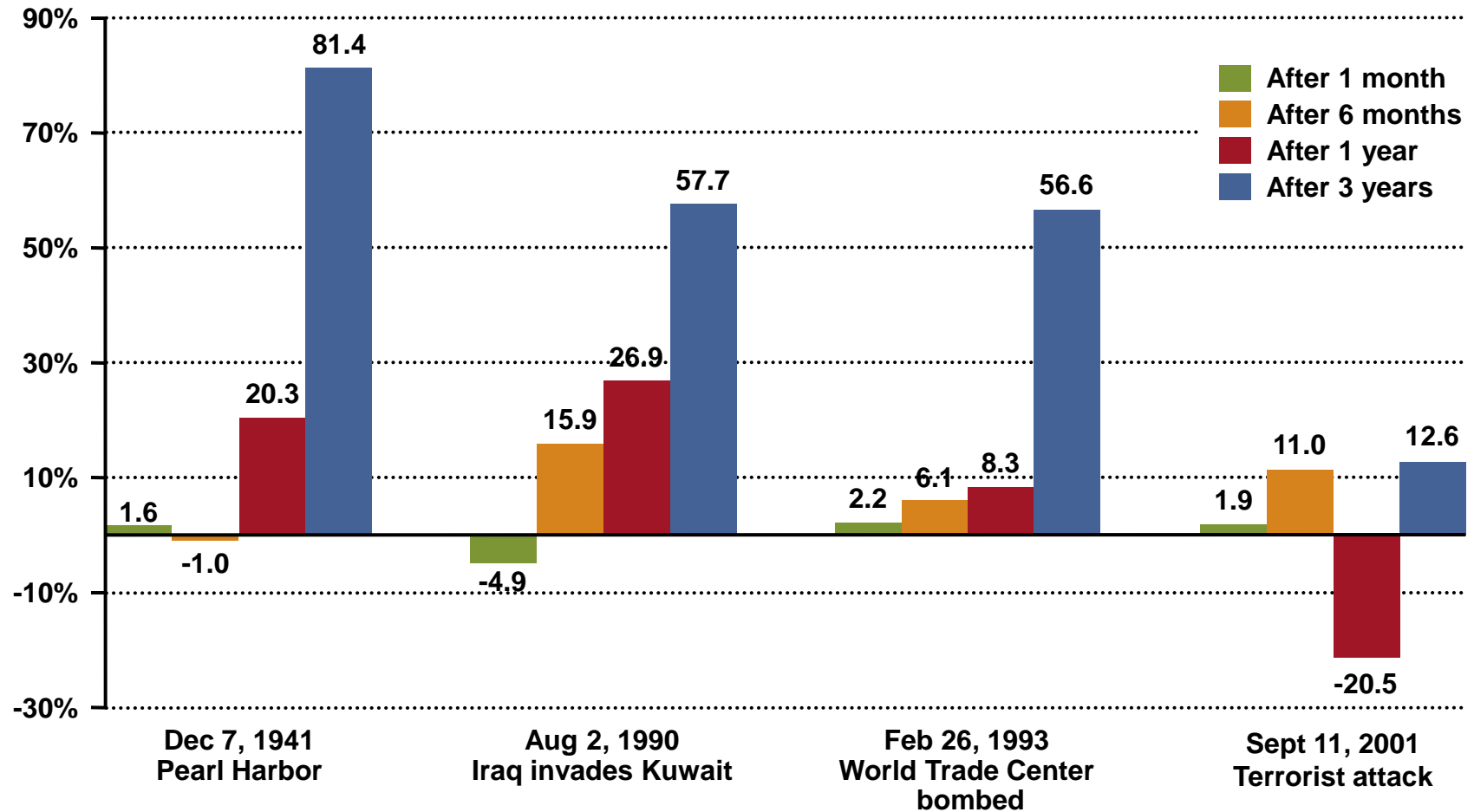


\*Period length and calculation exclude the month of initial change in policy to measure “pure” monetary policy environment.

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# U.S. market recovery after tragedy

## Cumulative return of the S&P 500 after tragic events



Monthly data is assumed. Returns reflect the percentage change in the index level from the end of the month that the event occurred to 1 month, 6 months, 1 year, and 3 years after.

# Money Market

A segment of the financial market in which financial instruments with **high liquidity** and **very short maturities** are traded.

The money market is used by participants as a means for **borrowing** and **lending** in the **short term**, from several days to just under a year.

Money market securities consist of **negotiable certificates of deposit (CDs)**, **bankers acceptances**, **U.S. Treasury bills**, **commercial paper**, **municipal notes**, **federal funds** and **repurchase agreements (repos)**.

## Certificate of Deposit (CD)

Promissory note issued by a bank.

It is a time deposit that **restricts** holders from withdrawing funds on demand. Although it is still possible to withdraw the money, this action will often incur a penalty.

### Example

You purchase a \$10,000 CD with an interest rate of 5% compounded annually and a term of one year.

At year's end, the CD will have grown to \$10,500 ( $\$10,000 \times 1.05$ ).

# Bankers Acceptances

A short-term debt instrument issued by a firm that is guaranteed by a commercial bank and as part of commercial transaction.

Banker's acceptances are traded at a discount from face value on the secondary market.

Banker's acceptances are regularly used financial instruments in international trade.

The date of maturity typically ranges between 30 and 180 days from the date of issue.

However, banks or investors often trade the instruments on the secondary market before the acceptances reach maturity

# Commercial Paper

An unsecured, short-term debt instrument issued by a corporation, typically for the financing of accounts receivable, inventories and meeting short-term liabilities.

Maturities on commercial paper rarely range any longer than 270 days.

The debt is usually issued at a discount, reflecting prevailing market interest rates.



# Repurchase Agreements (REPO)

A repurchase agreement is also known as a repo, RP, or sale and repurchase agreement.

Is the sale of securities together with an agreement for the seller to buy back the securities at a later date.

Repurchase price: should be greater than the original sale price, the difference effectively representing interest, sometimes called the repo rate.

The party that originally buys the securities effectively acts as a lender.

The original seller is effectively acting as a borrower, using their security as collateral for a secured cash loan at a fixed rate of interest.

# Repo

Almost equivalent to a **spot rate** combined with a **forward contract**.

The **spot sale** results in **transfer of money to the borrower** in exchange for **legal transfer of the security to the lender**.

The **forward contract** ensures **repayment of the loan to the lender** and **return of the collateral of the borrower**.

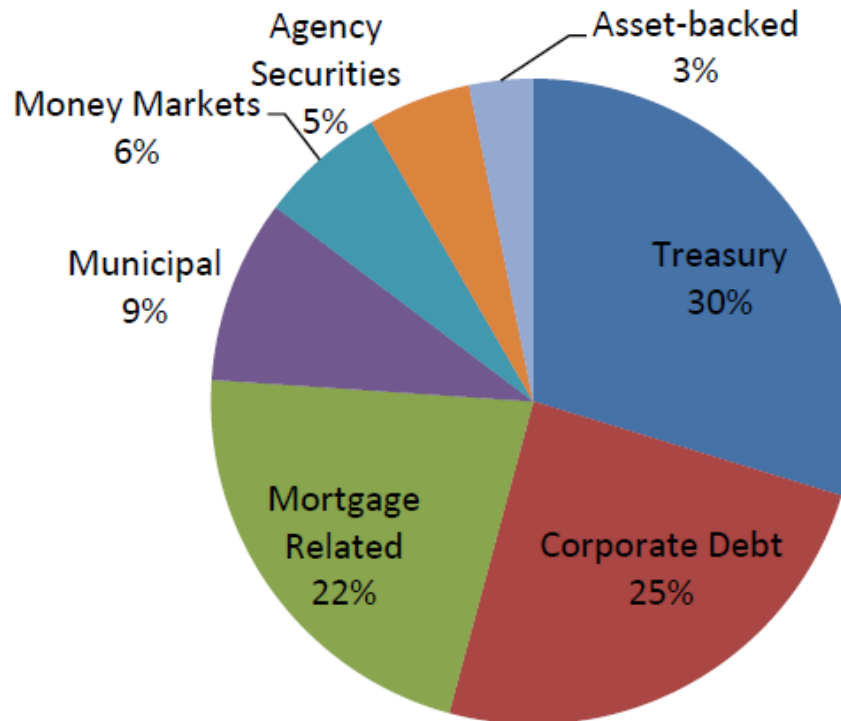
The difference between the **forward price** and the **spot price** is effectively the **interest on the loan**.

The settlement date of the **forward contract** is the **maturity date** of the loan.

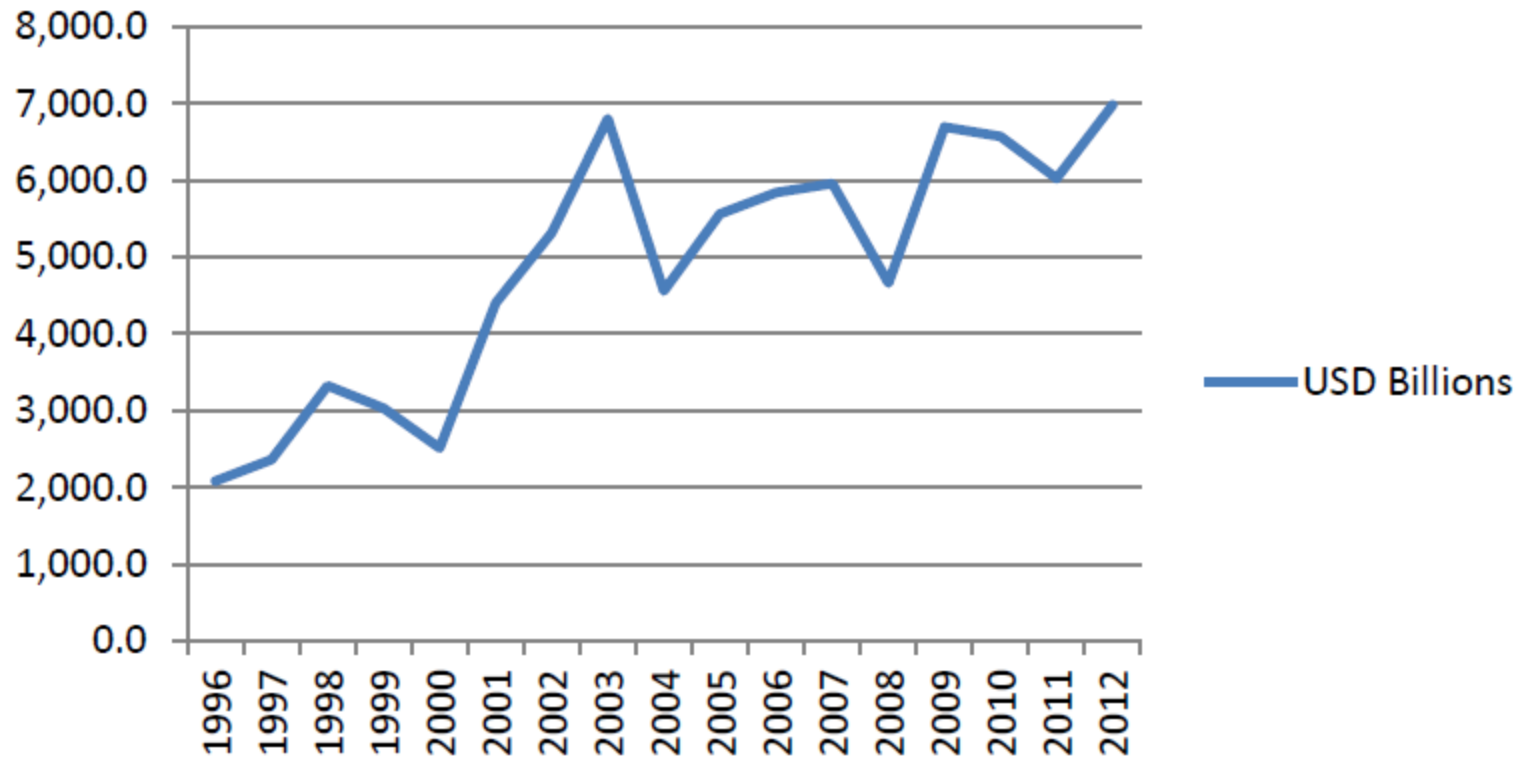
# Bond Market

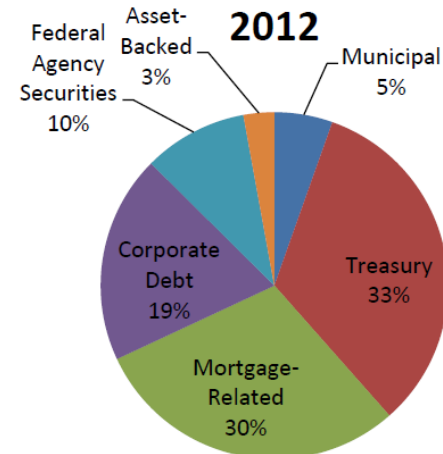
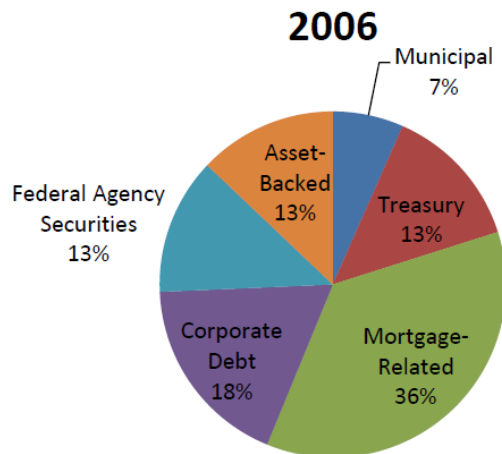
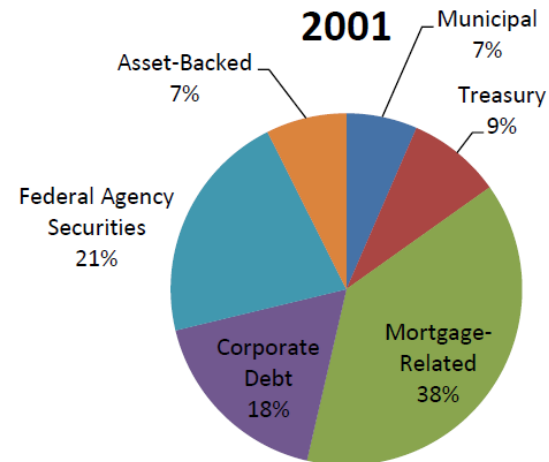
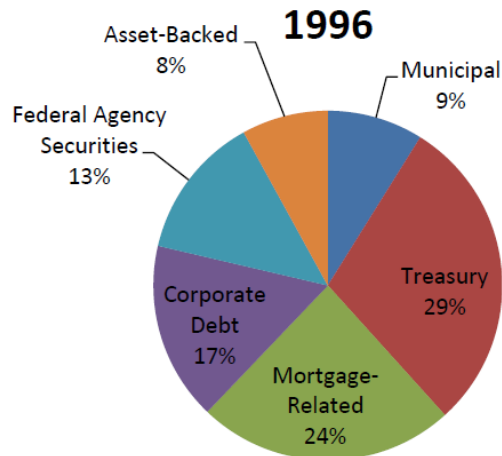
The bond market (also debt market or credit market) is a financial market where participants can issue new debt, known as the primary market, or buy and sell debt securities, known as the secondary market.

U. S. bond market size is Q4 2013 (in billions)



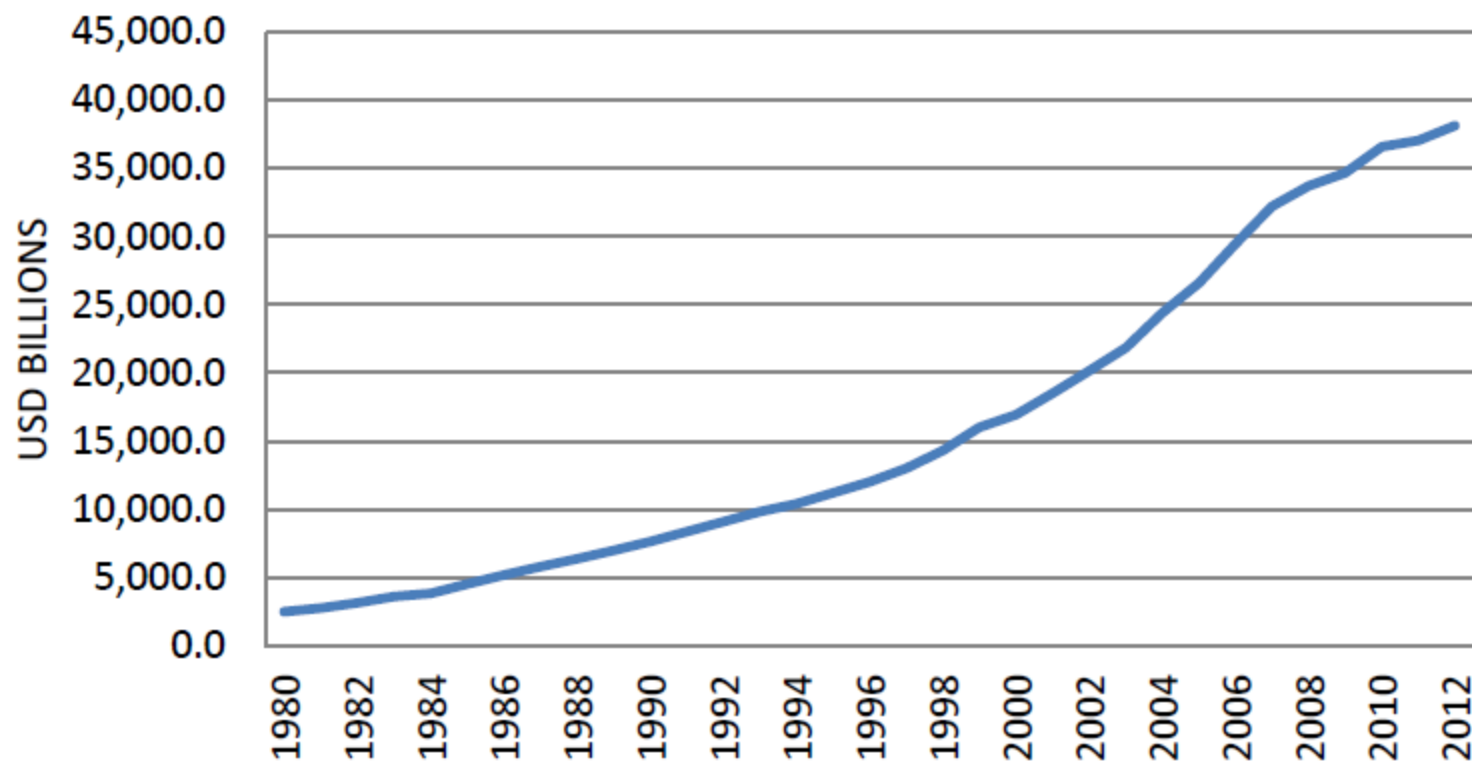
## Issuance in the US Bond Markets

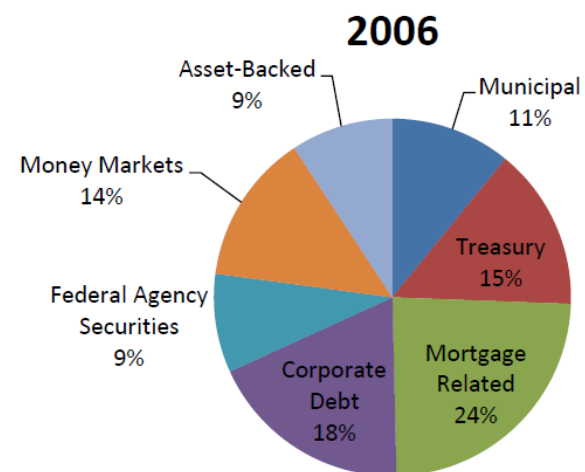
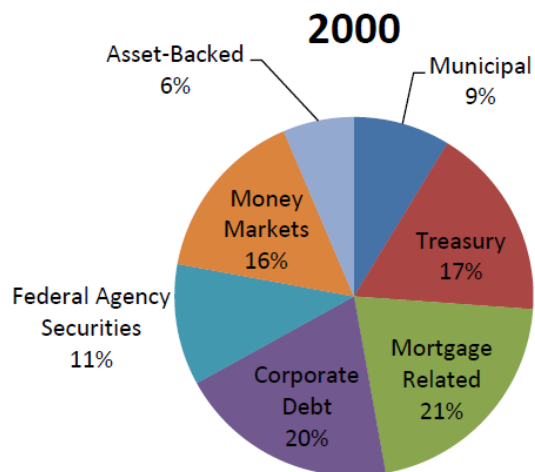
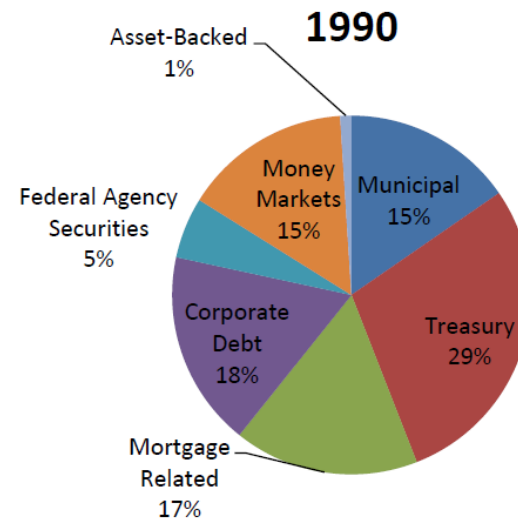
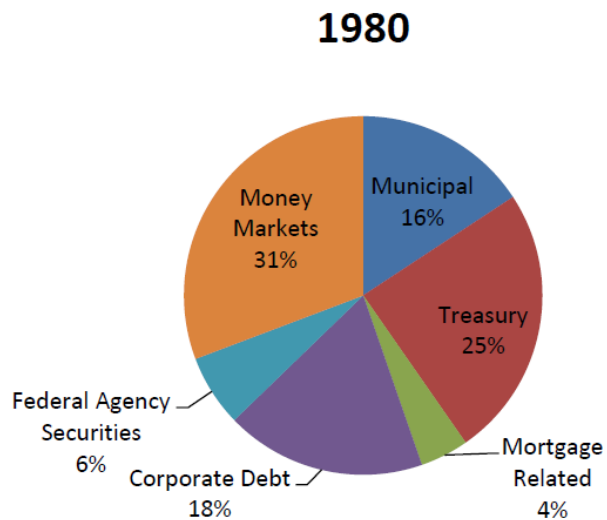


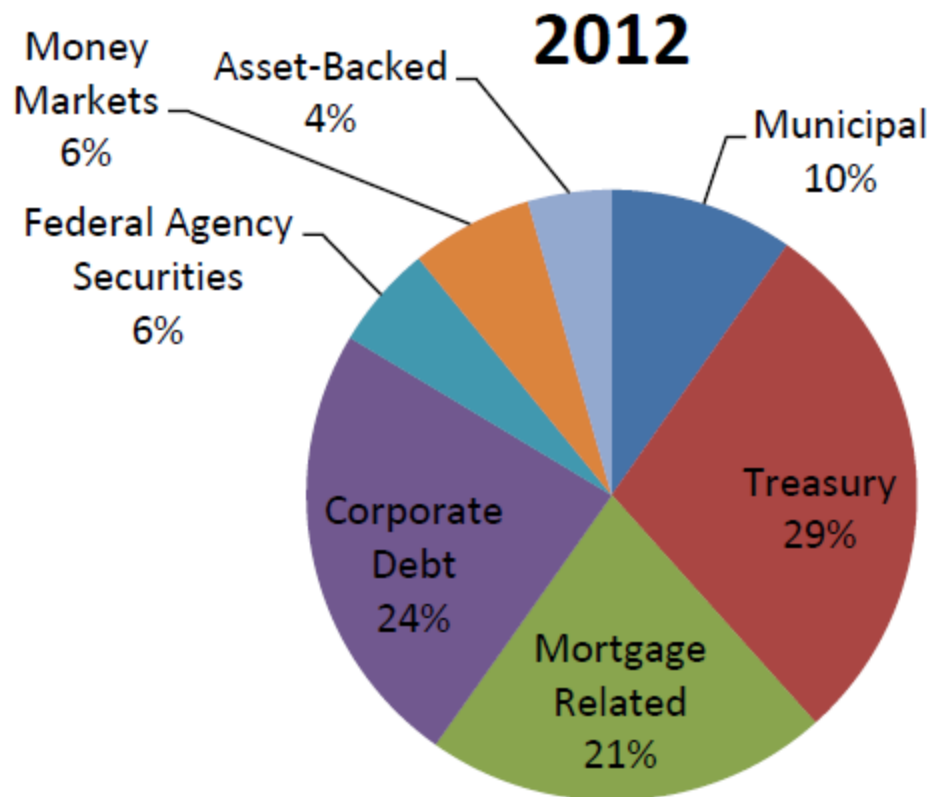


Source: SIFMA (Bloomberg, Dealogic, Thomson Reuters, U.S. Treasury, Fannie Mae, Freddie Mac, Ginnie Mae)

## Outstanding US Bond Market Debt

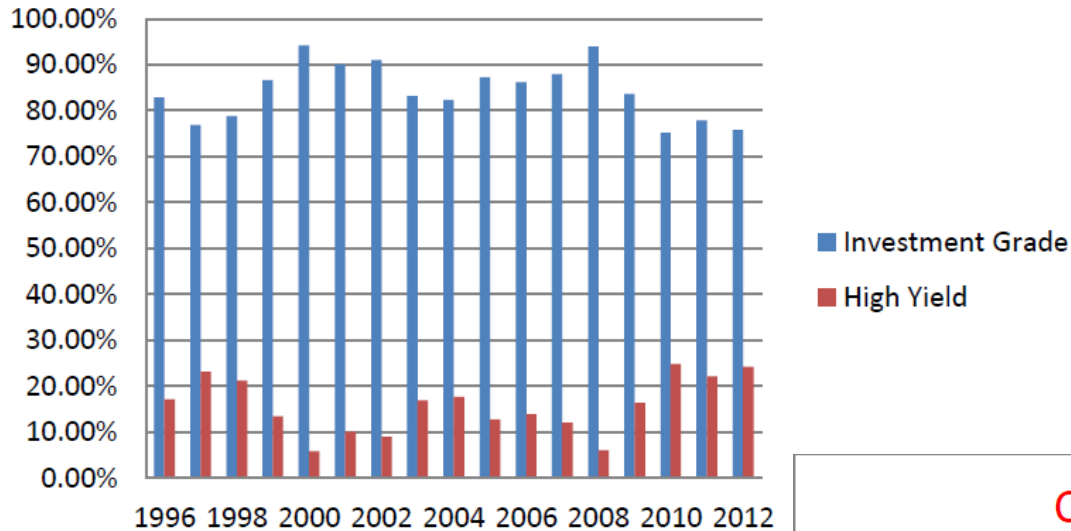








## Investment Grade vs. High Yield



## Callable & Non-Callable

