
Credit as an Investment

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The Issues

- Why invest in credit?
- How to invest in credit?

What is credit?

- The most fundamental problem in finance is getting your money back after you give it to someone else to invest
- Emergent historical solution has been bifurcation into equity and debt claims
 - Equity: No promise of repayment, but a share in profits; exit by way of sale of share interest
 - Debt: Explicit promise to repay; exit by maturation

What is credit?

- Risk of not-performing on the explicit promise to repay
- History
 - Take collateral
 - Shift to government
 - Restrict availability
 - Diversify
 - Within banking sector

Credit: the new world

- Quantification of credit risk
 - Merton et al
- Explicit isolation of credit risk
 - Banking products
 - Credit derivatives
- Secondary market trading
 - Single name
 - Synthetic pools
 - Tranched synthetic pools
- Diversification of credit exposure out of the banking sector

Why invest in credit?

- Credit is liquid
 - ISDA: CDS market of \$26 trillion notional
- Credit pricing becoming more transparent
 - TRACE
 - MarketAxess

Credit: An asset class?

- Large, liquid, transparent market
- Ability to create and manage diversified portfolios
- Ability to measure risk and return very finely

The investment risk space

- Big risks

- equities
- commodities
- currencies
- real estate

- Fine risks

- credit
- mortgage prepayment
- interest rates

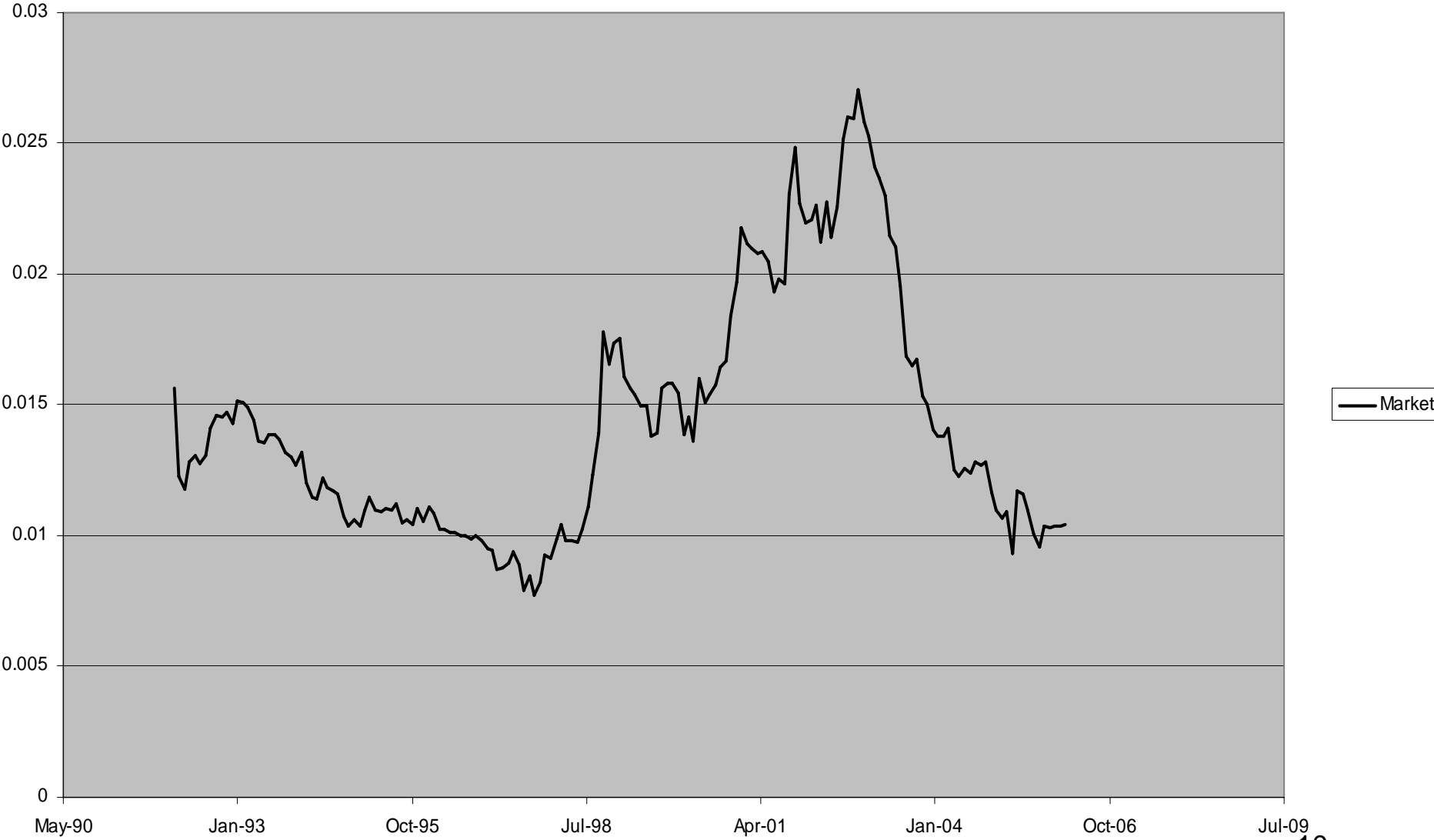
The characteristic of the fine risks is that:

- we can measure the risks and expected returns very accurately;
- we can construct portfolios with very explicit risk and return profiles.

Credit risk and return

- MKMV perspective
 - Expected spread =
$$\text{promised spread} - \text{EDF} * \text{LGD}$$
 - Unexpected loss =
$$\text{sqrt}[\text{EDF} * (1 - \text{EDF})] * \text{LGD}$$
- Credit return =
$$\text{promised_spread} * \text{return_interval} - \text{credit_duration} * \text{expected_spread_change}$$
- Credit standard deviation =
$$\text{credit_duration} * \text{std_dev_spread}$$

Ex ante modeled standard deviation of market portfolio of credit



Recap

- Investors like certainty of explicit promises
- Unfortunately borrowers don't always keep their promises
- Amazing ability in new world of credit to:
 - Measure those risks very accurately
 - Price and trade those risks
 - Create portfolios with very well defined risks and returns
 - Shift those risks to those best able to bear them

How to invest in credit?

- As investors we want more than just being able to measure risk and return well ...
- We want attractive risk and return

How can we invest in credit to get attractive risk and return?

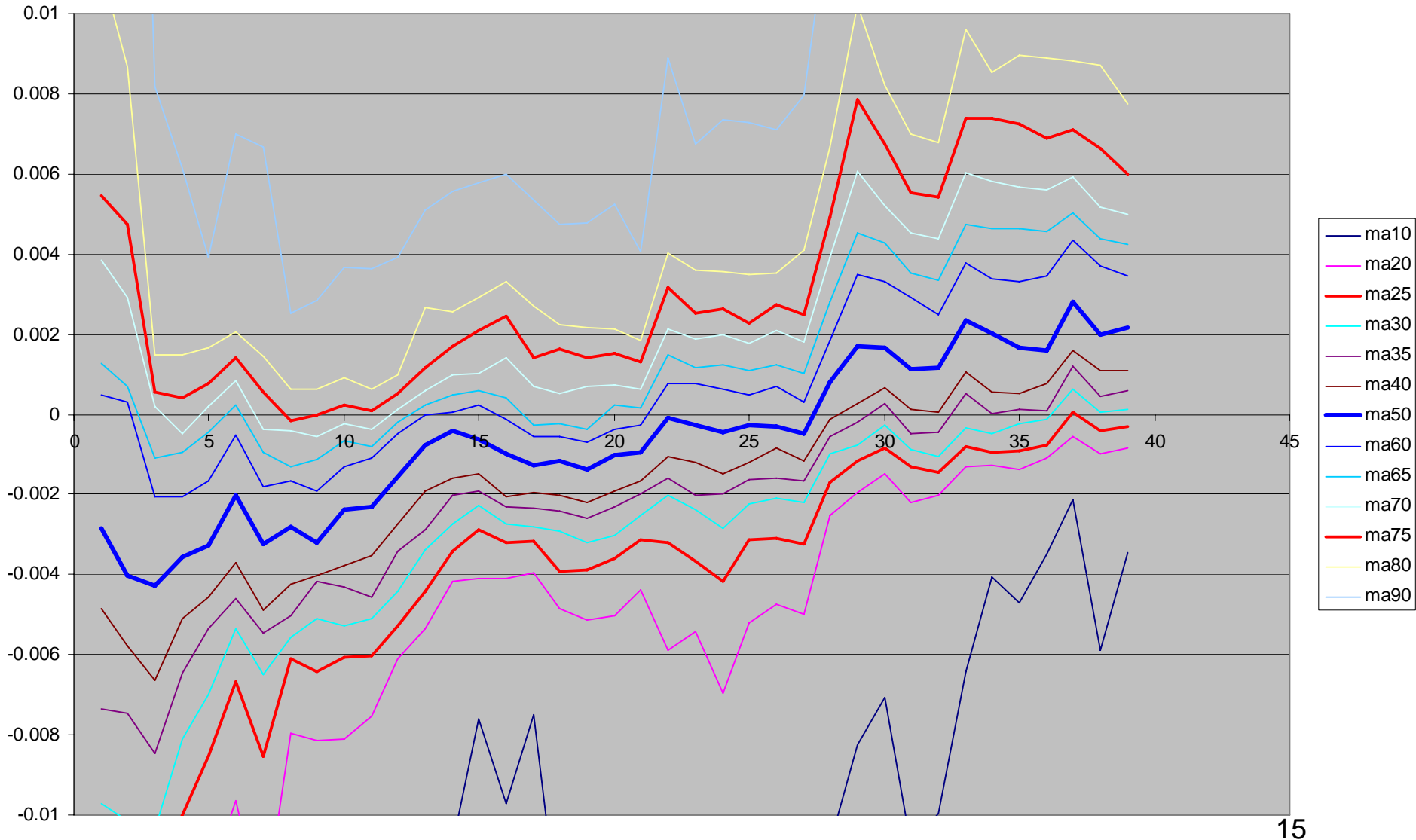
Three problems of credit

- Asset selection
- Large cross-sectional variation in individual asset risks
- Dynamic variation in
 - Individual credit risks
 - Aggregate credit risk

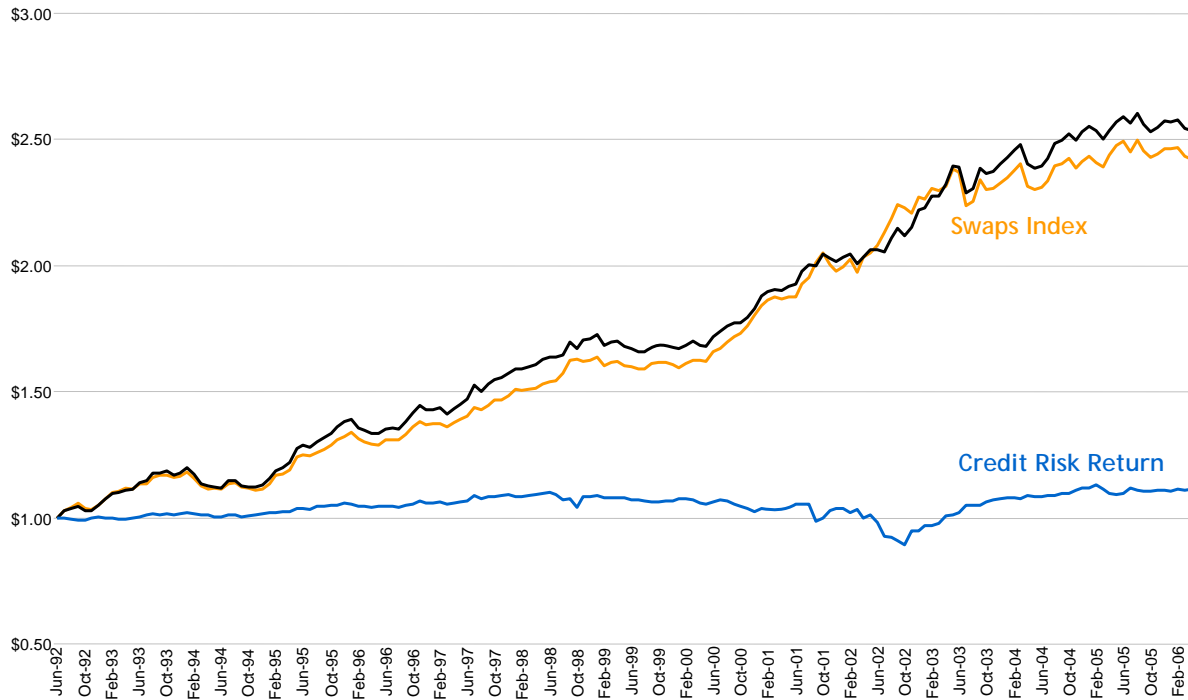
Asset selection

- Two findings
 - Return for risk in individual credits (Sharpe ratio) meets or exceeds Sharpe for other broad markets (equities, term risk in Treasuries, currencies)
 - The aggregate average return to risk in credit underperforms other broad markets
- How can these both be true?

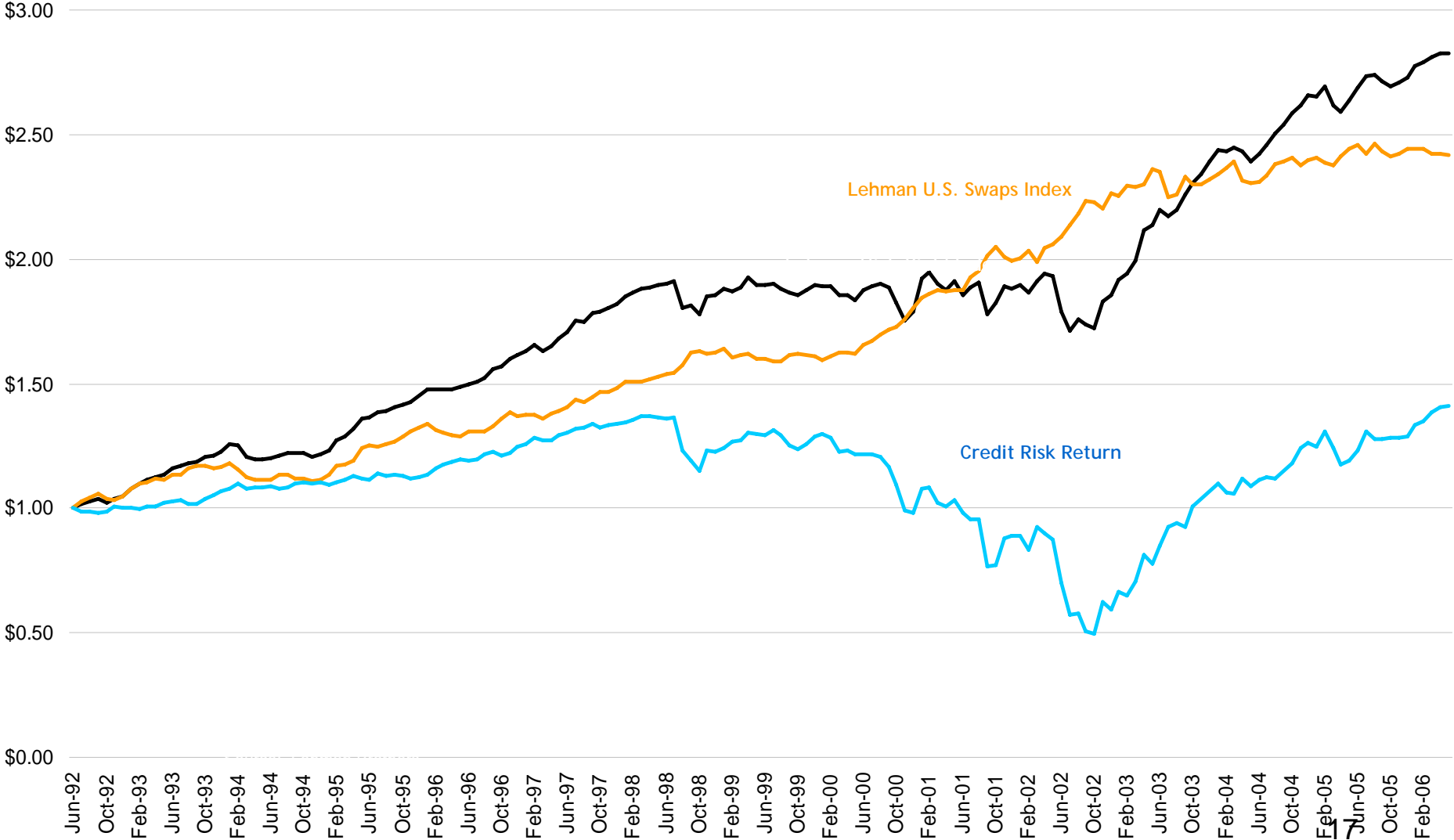
Deviation of spreads from model spreads, assuming Sharpe ratio of 0.50



Cumulative return for investment grade



Cumulative return for the high yield



Adverse selection in credit issuance

- Contradiction: aggregate level underperformance and generally satisfactory level of credit prices
- Resolution: when issuers find attractive pricing, they do more issuance:
 - Telecoms
 - Power utilities
- Implication: As an investor, you cannot trust to “market efficiency” in pricing
 - Need to be able to independently assess risk and thus adequacy of return

Large cross-sectional differences in risk

- In many portfolios there are differences in default probability on the order of 100:1, or even 1000:1, at any given moment in time
- Diversification does not work unless the risks are about the same order of magnitude

Managing cross-sectional risk differences

- Must have dramatically different holding amounts in order to hold dramatically different risks
- Low holding amounts with high risks; high holding amounts with low risks

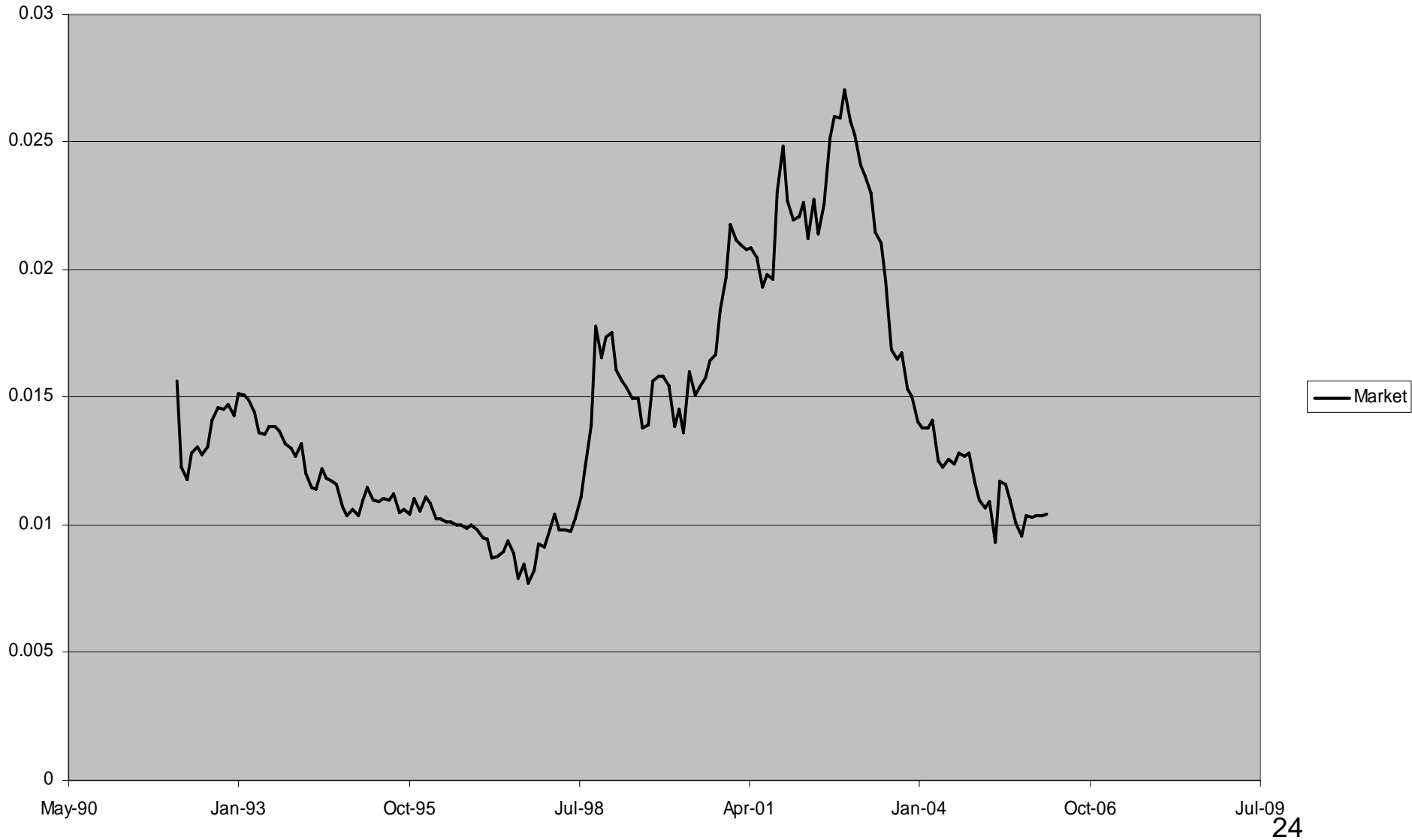
Dynamic variation in credit risk

- Individual
 - Default probability changes over time
 - Ford, General Motors, Worldcom, Enron
- Aggregate
 - Over the credit cycle, we typically see average differences of about 5:1 from peak to trough

Dealing with individual credit changes

- Portfolio management requires:
 - close monitoring
 - dynamic adjustment in holding amounts
- “Active” diversification as well as passive diversification

Dynamic variation in aggregate credit risk



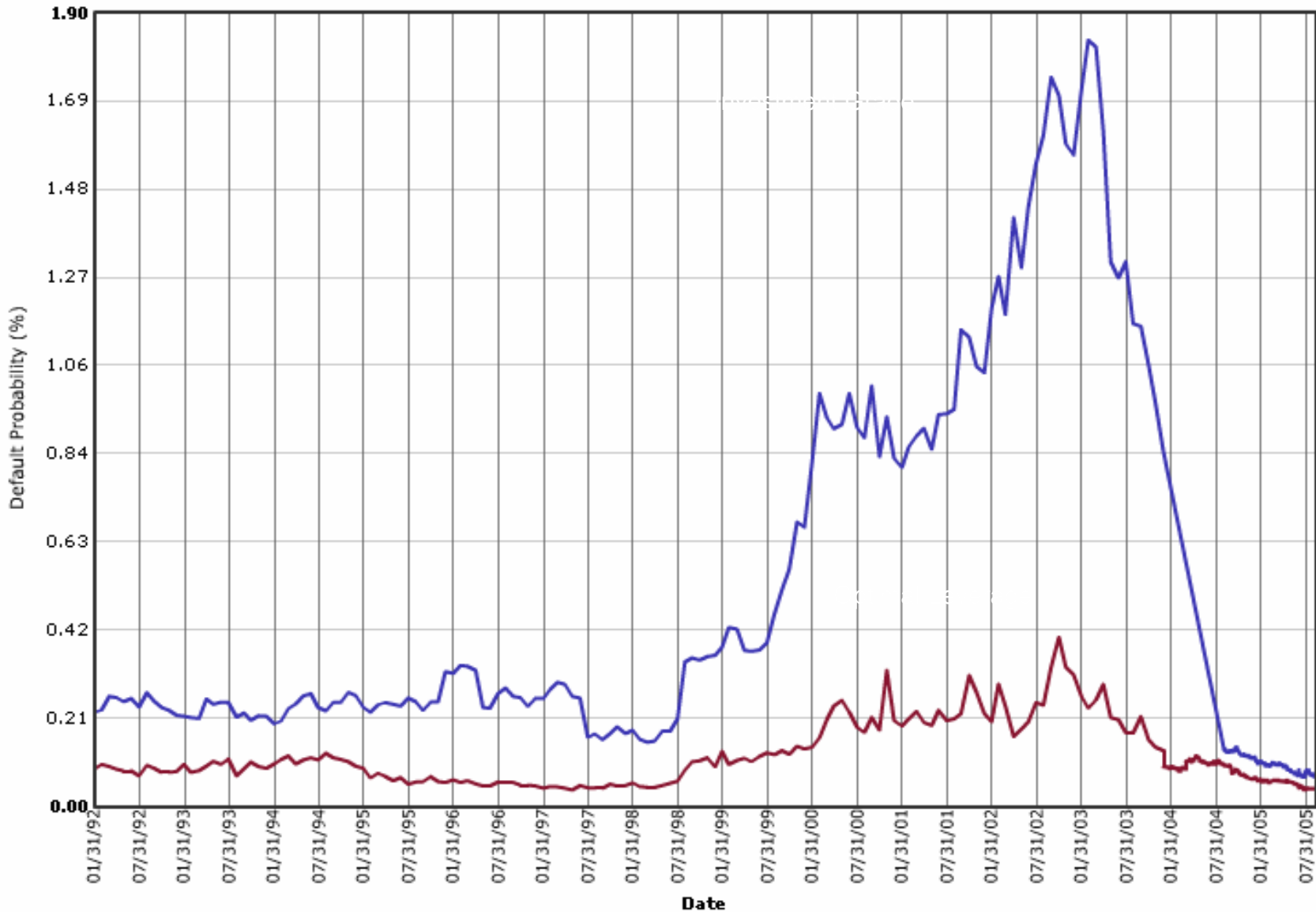
Why does aggregate credit risk change?

- Aggregate increases in
 - Volatility
 - Market leverage
- Firms, in general, work to maintain stable default probabilities at medium term horizons
 - In the short term, however, they often move leverage in the “wrong” direction when there is a shock
- A sequence of external shocks can cause aggregate leverage to increase while simultaneously raising volatility

Should dynamic variation in aggregate credit risk matter to investors?

- Investors generally want a stable, predictable return profile
 - Particularly true of institutional investors who often have to service fixed or quasi-fixed obligations
- Managing individual risks appropriately will reduce, but not eliminate, aggregate variation

Aggregate market weighted default probability (blue) versus risk managed default probability (red)



Credit market timing fallacy

- Fallacy:

You should only invest in credit when spreads are high, as you only make money in credit when spreads go down

- Reality:

Spreads levels predict primarily risk

Large possible losses during high spread periods

Difficult or impossible to time turning points in credit cycle

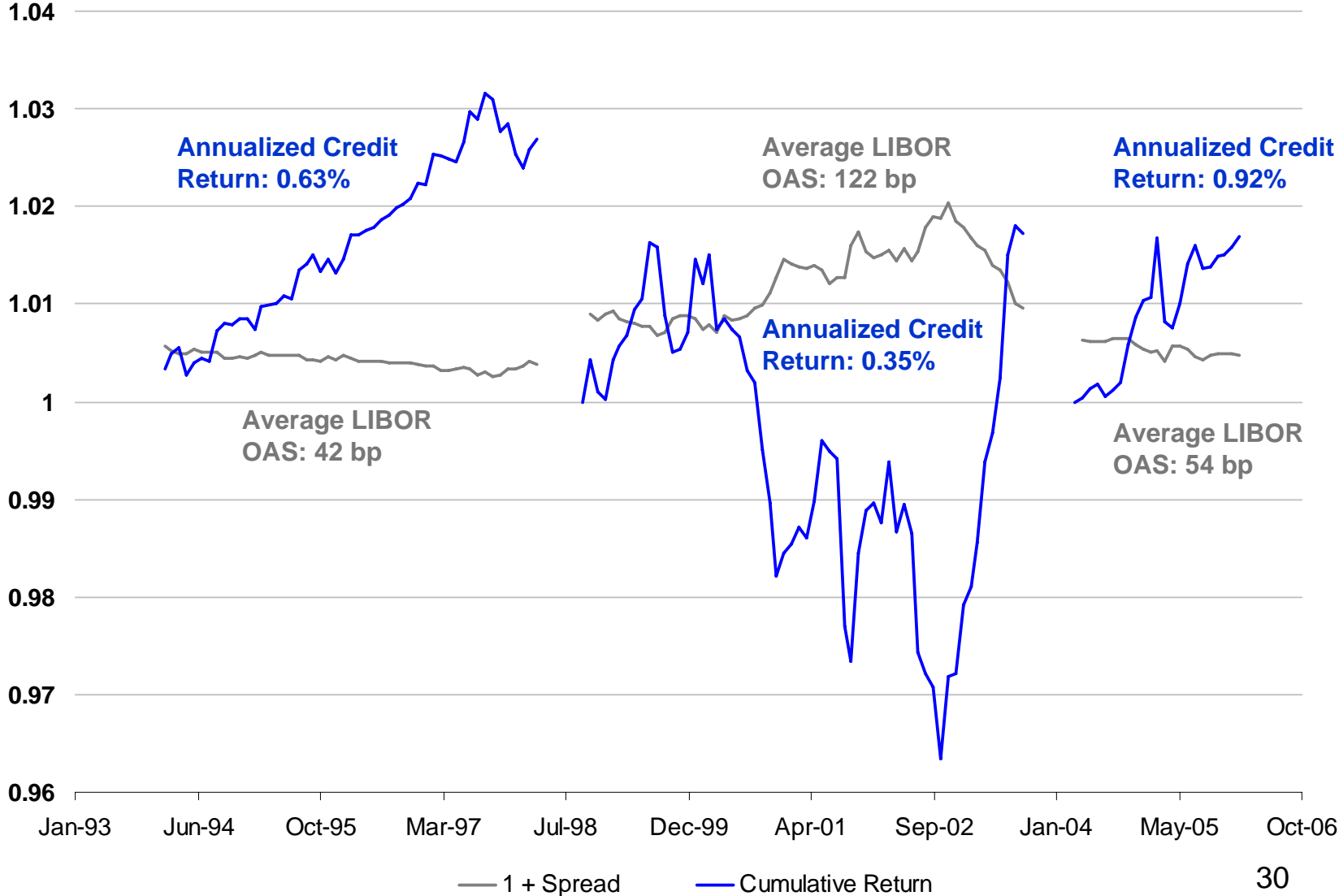
Significant opportunity costs to being out of market

High spreads \neq high returns

- Returns during low spread periods are often better than returns during high spread periods because of heightened risk during high spread periods

▪ Period	Average LIBOR OAS	Annualized Credit Return
▪ Jan '94 – Mar '98	42 bp	0.63%
▪ Oct '98 – Aug '03	122 bp	0.35%
▪ Apr '04 – Jan '06	54 bp	0.92%

High spreads \neq high returns

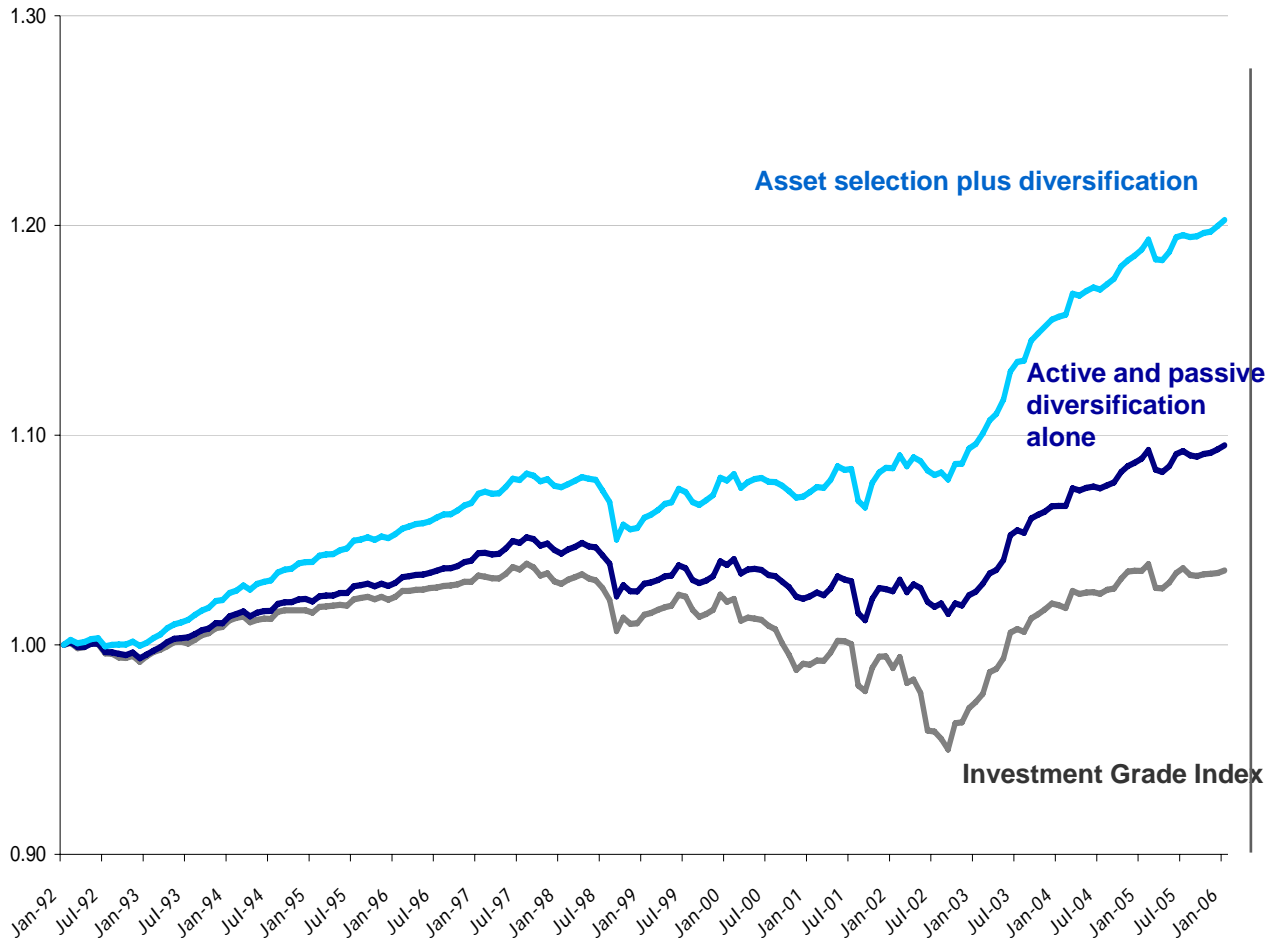


Recap

- New world of credit ...
 - Liquidity
 - Transparency
 - Risk transfer via well-diversified portfolios
- ...Makes good portfolio management feasible
 - Asset selection
 - Matching weights inversely to risks
 - Active monitoring and management of holding amounts to equalize weighted risk contributions (active diversification)
 - Diversification across entities (passive diversification)

Good portfolio management does not rely on market timing

Producing attractive return-to-risk



- An actively and passively diversified portfolio has significantly less risk and more return than the investment grade index
- Offsets the effect of adverse selection
- Good asset selection can further boost return without increasing risk significantly:
 - 100bp over investment grade index; 130bp over LIBOR
 - Significantly less risk than the investment grade index