The Equity Risk Premium, the Liquidity Premium, and Other Market Premiums

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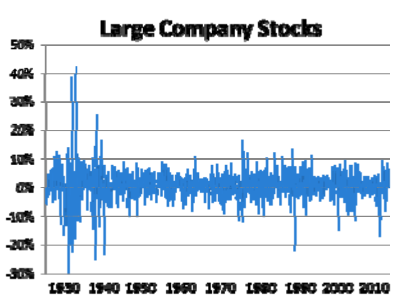
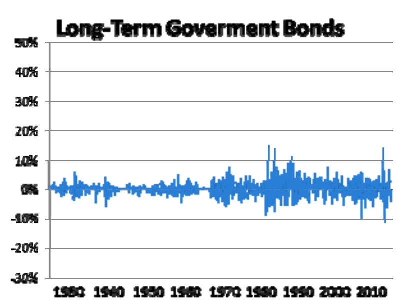
What is the Equity Risk Premium?

- Stocks are riskier than Bonds
- Investors demand an ERP to induce stock investments
- Bonds have gotten riskier recently





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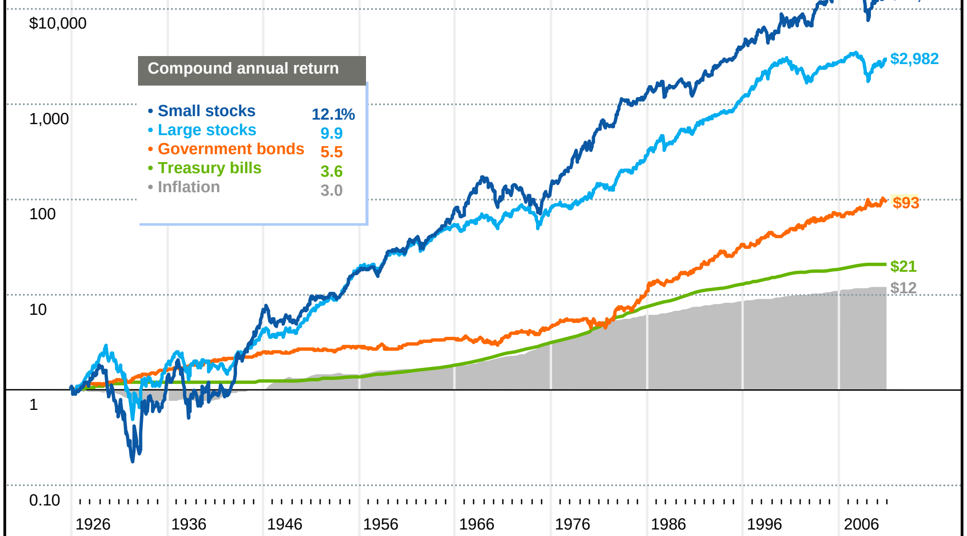
Stocks, Bonds, Bills, and Inflation 1926–2010



• **Past performance is no guarantee of future results.** Hypothetical value of $1 invested at the beginning of 1926. Assumes reinvestment of income and no transaction costs or taxes. This is for illustrative purposes only and not indicative of any investment. An investment cannot be made directly in an index. 3/1/2011

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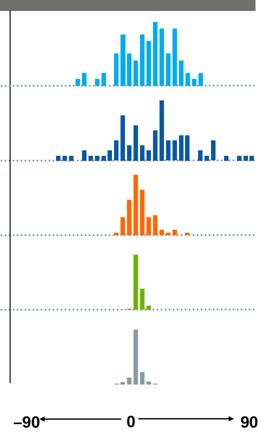
Summary statistics 1926–2010

	Compound annual return	Arithmetic annual return	Risk (standard deviation)
Large stocks	9.9%	11.9%	20.4%
Small stocks*	12.1%	16.7%	32.6%
Government bonds	5.5%	5.9%	9.5%
Treasury bills	3.6%	3.7%	3.1%
Inflation	3.0%	3.1%	4.2%

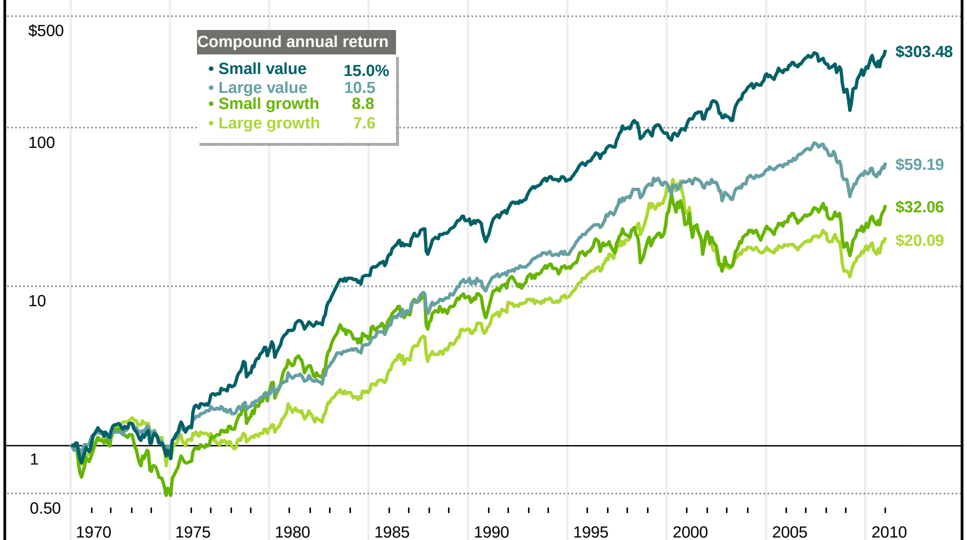


• **Past performance is no guarantee of future results.** *The 1933 small company stock total return was 142.9%. This is for illustrative purposes only and not indicative of any investment. An investment cannot be made directly in an index. 3/1/2011

U.S. Stock and Bond Premiums 1926-2010

Compound Annual Returns	
Equity Risk Premium (Stocks – LT Gov't Bonds)	4.4%
Horizon Premium (LT Gov't – UST Bills)	1.9%
Default Premium (LT Corp – LT Gov't)	0.4%
Real Interest Rate (UST Bills - Inflation)	0.6%

Growth and Value Investing
1970–2010



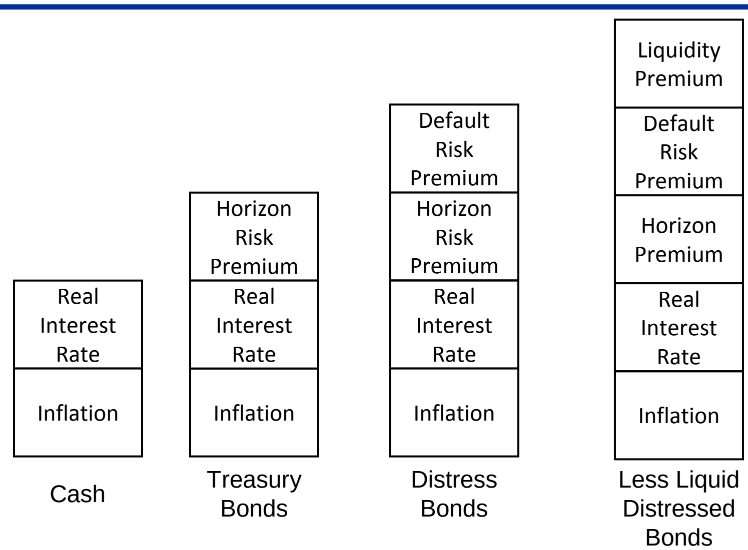
• **Past performance is no guarantee of future results.** Hypothetical value of $1 invested at the beginning of 1970. Assumes reinvestment of income and no transaction costs or taxes. This is for illustrative purposes only and not indicative of any investment. An investment cannot be made directly in an index. 3/1/2011

Explaining Long Run Returns

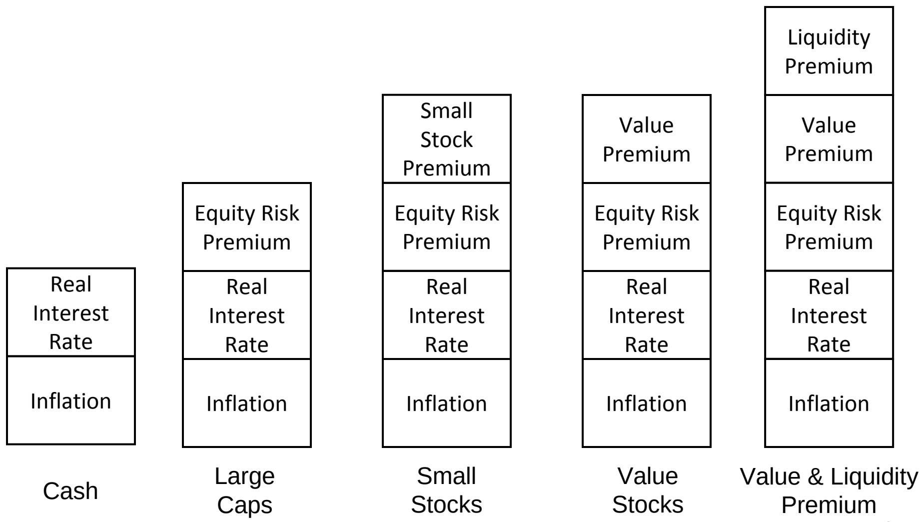
Expected Return Premiums for Stocks
- The Equity Risk Premium (Market or Beta Risk)
- Small Stock Premium
- Value/Growth Premium
- Liquidity Premium

Expected Return Premiums for Bonds
- Horizon Premium
- Default Premium
- Liquidity Premium

Stacking the Bond Premiums



Stacking the Equity Premiums



What is Meant by Liquidity?

Liquidity in the Financial System
- High Savings Rates
- Low Interest Rates
- Easy Access to Capital

Liquidity in Trading
- Low Transactions Costs
- High Trading Volume
- Low price impact for Large orders

Liquidity in Valuation
- Pay extra price for liquid securities
- Extra expected returns for less liquid securities

Liquidity and Valuation

Liquid securities
- Easier to trade with lower market impact costs
- Higher priced for same set of cash flows
- Desired for rapid turnover investors

Less Liquid securities
- More difficult to trade
- Lower priced for same set of cash flows
- Higher expected returns, great for longer term investors

What is the Liquidity Premium?
- More Liquid assets are priced at a premium
- Less Liquid assets are priced at a discount,
  thus having higher return

The Data

Up to 3500 U.S. stocks, 1972-2010
- Size measured by year-end capitalization,
  value measured by E/P ratios, momentum
  measured by previous year returns
- Liquidity measured by trading activity
- Matrixes independently sorted into quartiles
  with equally weighted returns in each cell
- Annual rebalancing

We Show Liquidity Premium for Stocks
- vs. Size
- vs. Value
- vs. Momentum

Liquidity vs. Size

U.S. Equity Annual Return Quartiles
1972-2010

Liquidity (Low → High)

Size		1	2	3	4	All
Small	1	18.17%	17.46%	13.51%	6.16%	14.73%
	2	16.87%	15.15%	11.68%	6.52%	12.74%
	3	15.15%	14.36%	12.87%	9.56%	13.16%
Large	4	12.49%	11.48%	11.55%	9.87%	11.68%
	All	16.22%	14.48%	12.60%	8.79%	

Liquidity dominates size as a return predictor

Source: Ibbotson, Roger, Zhiwu Chen, and Wendy Hu, "Liquidity as an Investment Style" , April 2011.

Liquidity vs. Value/Growth

U.S. Equity Annual Return Quartiles
1972-2010

Liquidity (Low → High)

		1	2	3	4	All
Value	1	20.82%	17.98%	17.02%	12.53%	17.71%
	2	15.74%	14.93%	13.54%	12.45%	14.45%
	3	13.97%	12.46%	10.69%	8.04%	11.22%
Growth	4	11.93%	11.85%	7.88%	3.88%	8.37%
	All	16.22%	14.48%	12.60%	8.79%	

Both liquidity and value predict returns

Source: Ibbotson, Roger, Zhiwu Chen, and Wendy Hu, "Liquidity as an Investment Style" , April 2011.

Liquidity vs. Momentum

U.S. Equity Annual Return Quartiles
1972-2010

Liquidity (Low → High)

Momentum		1 (Low)	2	3	4 (High)	All
High	1	17.41%	15.74%	12.96%	11.02%	14.52%
	2	17.18%	15.77%	12.86%	9.47%	14.73%
	3	15.29%	14.45%	13.74%	9.38%	13.76%
Low	4	14.31%	10.64%	9.83%	5.59%	8.90%
	All	16.22%	14.48%	12.60%	8.79%	

Both liquidity and momentum predict returns

Source: Ibbotson, Roger, Zhiwu Chen, and Wendy Hu, "Liquidity as an Investment Style" , April 2011.

Liquidity Regressions on Fama & French Factors
1972-2010

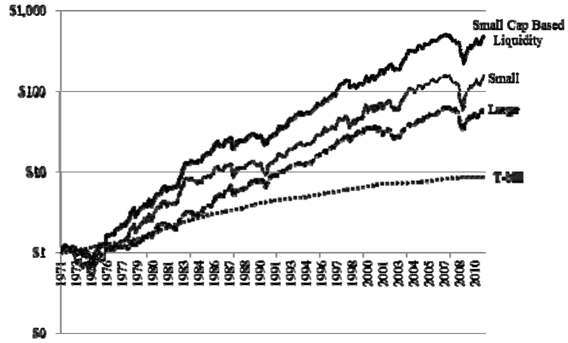
	Annualized Alpha	Market M-RF	Size SMB	Value VMG	Momentum HML	RSQ
Long/Short Liquidity Factor (column 1-4)	**4.16%***	-0.40	-0.22	+0.41	+0.16	51.6%
Low Liquidity Long Portfolio (R-RF) (column 1)	**1.94%***	+0.79	+0.55	+0.38	+0.04	94.4%

Liquidity can be expressed as long only or as a long/short factor.

*Statistically significant at 5% level.

Source: Ibbotson, Roger, Zhiwu Chen, and Wendy Hu, "Liquidity as an Investment Style" , April 2011.

Small-Cap Liquidity Portfolio

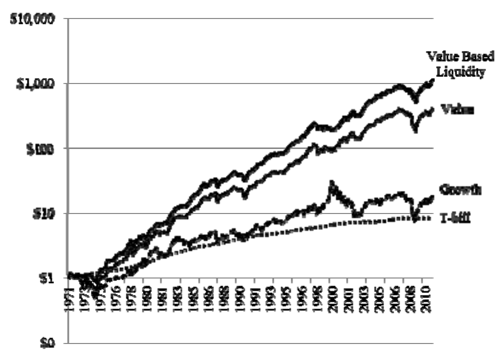


Annualized Alpha	Market M-RF	Size	Value	Momentum	RSQ
3.04%*	0.77	0.81	0.45	0.03	89.4%

*Statistically significant at 5% level.

Source: Ibbotson, Roger, Zhiwu Chen, and Wendy Hu, "Liquidity as an Investment Style" , April 2011.

Value-Based Liquidity Portfolio



Annualized Alpha	Market M-RF	Size	Value	Momentum	RSQ
5.91%*	0.76	0.50	0.55	-0.03	85.8%

*Statistically significant at 5% level.

Source: Ibbotson, Roger, Zhiwu Chen, and Wendy Hu, "Liquidity as an Investment Style" , April 2011.

Two Reasons for Investing in Liquidity

Less Liquid stocks trade at a discount to more liquid stocks

- Buying Less Liquid stocks means that the same cash flows can be bought cheaper

Liquidity is mean reverting

- Stocks move in and out of favor; as liquidity rises (falls), valuations rise (fall), creating high (low) networks

Liquidity Stock Migration

Stock Quartile Weights One Year After Liquidity Portfolio Formation (1972-2010)

	Weights	1 Low Liquidity	2	3	4 High Liquidity
Initial Portfolio	1 Low Liquidity	**74.9%**	19.4%	4.3%	1.5%
	2	20.7%	**50.6%**	22.5%	6.2%
	3	3.0%	25.3%	**49.4%**	2.32%
	4 High Liquidity	0.5%	4.4%	24.2%	**70.9%**

Most stocks stay in initial quartile, but many migrate.

Source: Ibbotson, Roger, Zhiwu Chen, and Wendy Hu, “Liquidity as an Investment Style” , April 2011.

Returns from Liquidity Migration

Stock Returns One Year After Quartile Portfolio Formation (1972-2010)

Initial Portfolio (Rows)

Returns	1 Low Liquidity	2	3	4 High Liquidity
1 Low Liquidity	**10.0%**	33.5%	71.8%	138.5%
2	-1.39%	**11.0%**	30.5%	83.4%
3	-9.2%	0.3%	**11.6%**	36.7%
4 High Liquidity	-24.1%	-13.5%	-0.3%	**13.5%**

As liquidity rises, valuations rise and returns are high

Source: Ibbotson, Roger, Zhiwu Chen, and Wendy Hu, "Liquidity as an Investment Style" , April 2011.

Conclusions

The Equity Risk Premium

- Stocks will outperform bonds over the long run
- The historical ERP of 4.4% is a reasonable expectation

There are many premiums in stock and bond markets

- Bonds: Horizon, Default, Liquidity
- Stocks: Size, Value, Momentum

Liquidity premiums in public equity markets

- As substantial as, and different from size, value, momentum
- Liquidity, like risk, should be managed to produce returns