

## 2003 Pensions Convention

1 - 3 June  
Grand Hotel, Brighton

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## The Equity Premium

Paul Bostock

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### The equity premium puzzle

In the 20<sup>th</sup> Century equities beat bonds and cash by 6% *pa*...  
Is this a good expectation? - Theory and intuition suggest not

Mehra and Prescott, "The Equity Premium Puzzle" 1985,  
theory suggested a premium less than 1/2 % *pa*...  
Is this a good expectation? - Data and intuition suggest not

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## Why this is important

This is all about comparing expectations for equities, bonds and cash

- Investment – Asset Valuation
- Pensions - Fund Valuation
- Issuers - Corporate Finance

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## The equity premium puzzle

Should we expect equities to out-perform cash and bonds?

- why (risks, costs) ?
- by how much ?
- we will construct the premium using answers to these questions

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## The equity what premium?

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## The total equity premium

the additional required rate of return  
that investors need to be offered  
to tempt them into buying equities instead of  
government bonds

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## ~~The equity cost premium~~

the piece of the required rate of return that investors need to be offered  
to tempt them into buying equities instead of government bonds...

that is attributable to cost

Investors require similar returns after costs, not before costs

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## The equity risk premium

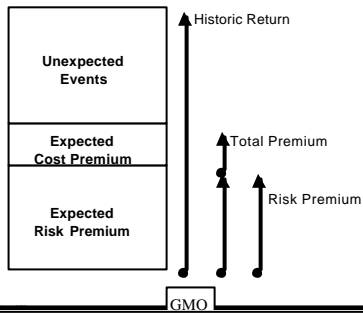
the piece of the required rate of return that investors need to be offered to  
tempt them into buying equities instead of government bonds...

that is attributable to risk

Not transaction costs, not taxes

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## The different "Equity Premia"



## What can we learn from history?

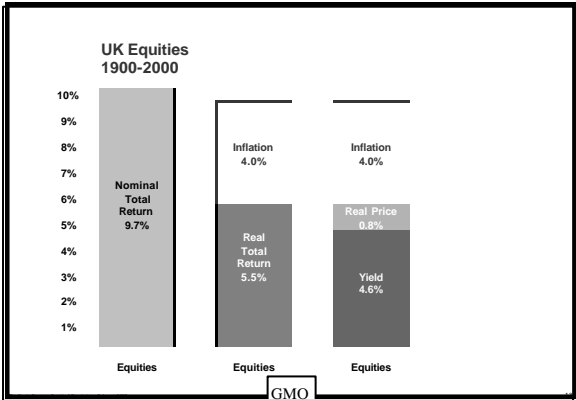
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## How did things look in 1900?

USA	UK
Zero inflation	Zero inflation
0.1% 1890-1900,	0.5% 1890-1900,
-0.5% 1870-1900	-0.7% 1870-1900
Cash 4.3%	Cash 4.0%
Bonds 2.9%	Bonds 2.8%
Equities yield 3.8%	Equities yield 6.3% (?data)
Expect 5-6% return	Expect 6-7% return
Pop. 76m	Pop. 41m
President W McKinley	Queen Victoria

PM Marquess of Salisbury

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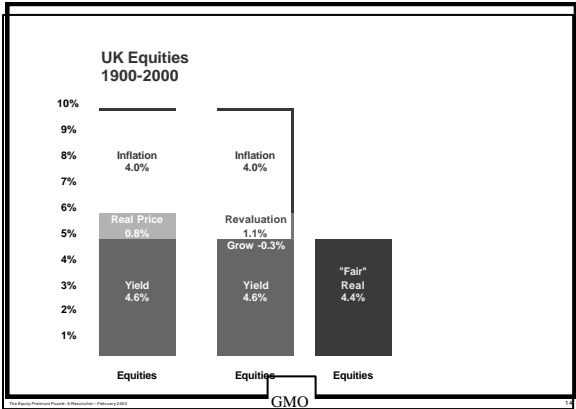
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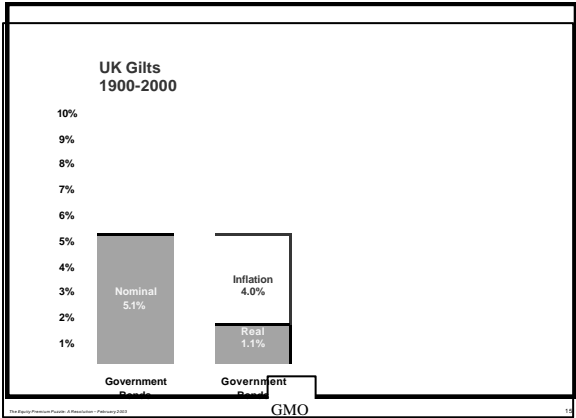
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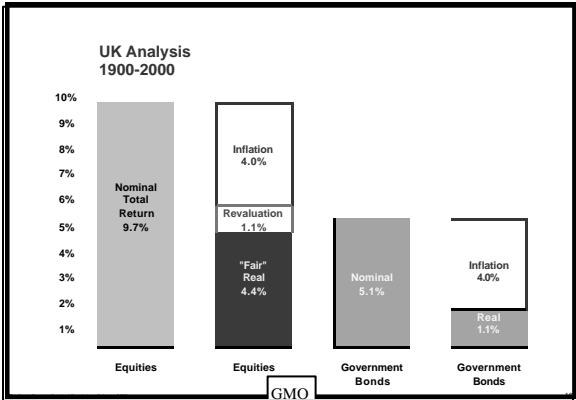
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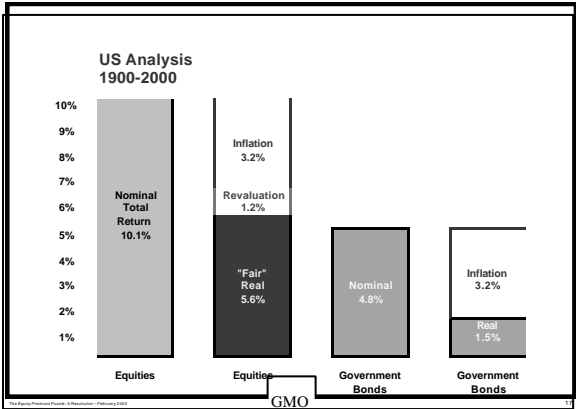
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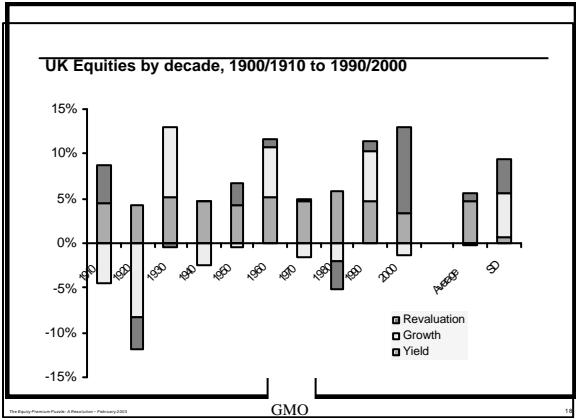
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## Historic risk premium

In the longer term, return is dominated by income.

...

Has everyone adopted market value too zealously?

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## The best of the historic estimates...

Author(s)	Total Premium % <i>pa</i>
Best, Byrne 2001	2.1±1.3 over bonds
Wilkie 1995 (UK)	2.8±2.0 over bonds 4.0±2.0 over cash
Bernstein 1997	3.0±0.8 over bonds
Siegel 1990	2.0±0.5 over bonds
Arnett, Bernstein 2002	2.4±1.0 over 10y bonds
Fama, French 2000	3.4±1.0 over cash
Best Estimate	2.7±1.0 over bonds

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## Historic returns are an unreliable guide

Historic return is not expected return

1. historic return is dominated by the unexpected
2. historic return has been highly volatile
3. historic return is backward looking
4. historic return measure the total premium
5. if the true premium falls, historic returns rise

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## A new assessment

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## Comparing cash and shares...

Cash



Shares



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## Comparing cash and shares...

is much easier in smaller steps

Cash



Govt. Bonds



Corp. Bonds



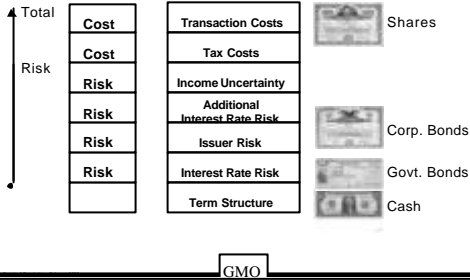
Shares



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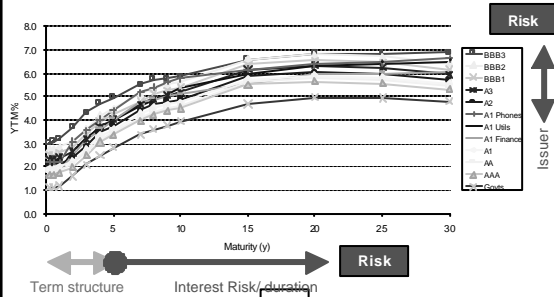


## The new approach

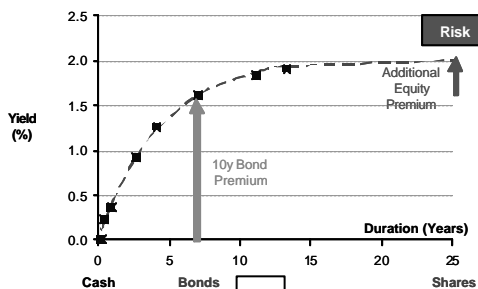


## Risk Premium: Interest Rates and Issuers

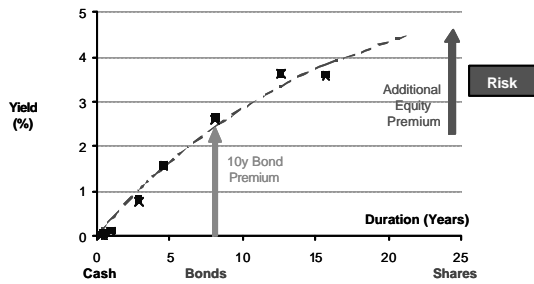
Dec 31<sup>st</sup> 2002



## US average yields 1982-2002: Differences by duration



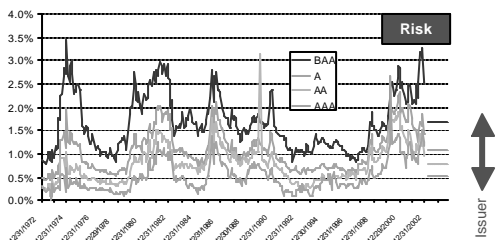
### US yields 2002: Differences by duration



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### ...and US issuer risk

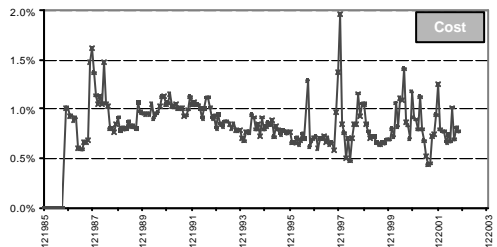
#### US yield spreads over governments



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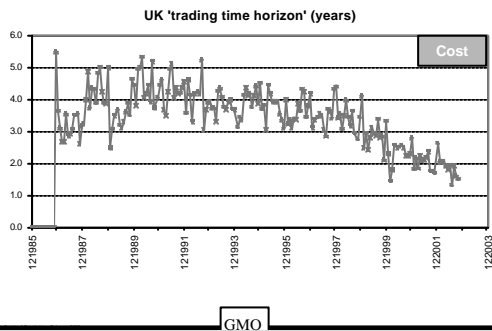
### Transaction cost analysis

#### UK average spread



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# Transaction cost analysis : Amortise forever! ...or...




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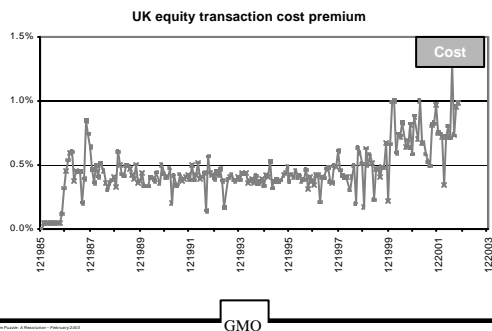
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## Transaction cost analysis : UK results




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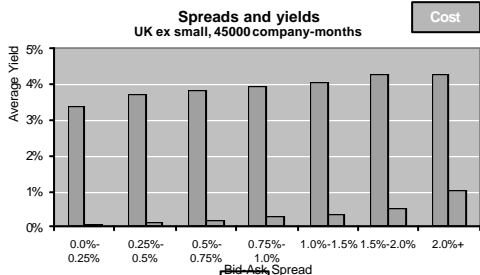
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## UK transaction costs: The market really pays a premium




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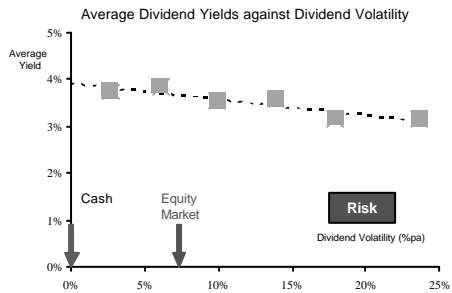
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## A premium for dividend volatility?



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## Collecting Results: US TOTAL premium "by construction"...

Shares	Transaction Costs	0.5±0.2	
	Tax	0.0±0.0	
	Additional Duration	0.3±0.4	
Corp. Bonds	Income Volatility	0.0±0.1	
Govt. Bonds	Issuer Risk	1.4±0.4	
	Duration	0.3±0.4	
Cash	Term Structure	0.0±0.1	

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## Collecting results: US TOTAL premium, risk premium, etc "by construction"...

	Longer
Total Premium v. Bonds	2.2±0.6
Risk Premium v. Bonds	1.7±0.6

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**Collecting results : UK TOTAL premium**  
**"by construction"...**

**Shares**

Transaction Costs	1.0±0.5
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Tax	0.1±0.1
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Additional Duration	0.2±0.3
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**Corp. Bonds**

Income Volatility	0.0±0.1
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**Govt. Bonds**

Issuer Risk	1.5±0.5
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Duration	0.9±0.3
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**Cash**

Term Structure	0.0±0.1
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**Collecting results : UK TOTAL premium, risk premium, etc**  
**"by construction"...**

	Longer
Total Premium v. Bonds	2.8±0.8
Risk Premium v. Bonds	1.7±0.6

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**Does this tell us anything about markets? USA Dec 2002...**

	Dec 2002
Total Premium v. Bonds	4.7±1.1
Risk Premium v. Bonds	4.1±1.1

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## Does this tell us anything about markets?

Required US equity returns Dec 2002

Long Bonds (ex term structure) 3.6% + Total Premium 4.7% = 8.3%

*cf*

Expected US return Dec 2002 (ex. mean reversion)

real growth 1.5% + inflation 2.2% + yield 1.8% = 5.5%

The expected equity return is (way) below the required level.

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## Further work

Is each component fairly priced, theoretically?

What about a more realistic time horizon?

What about real v nominal analysis?

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## Summary

A new framework for comparing required returns across assets

Resolution of the puzzle – the measurement was wrong

Some predictions about the future

- History unlikely to be repeated; expect 2-3% premium, not 6%
- UK around fair value, US highly over-valued

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## The Equity Premium

Paul Bostock

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