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Financial Economics

Past, present and future (?)

Charles Cowling
September 2008

Agenda

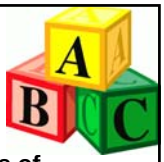
- The key theories
- The key papers
- The key applications
- The key players
- …what does the future hold?

The key theories

Phelim Boyle's "magnificent seven" :

- The no-arbitrage principle
- Mean-variance portfolio selection
- Capital structure irrelevance
- The capital asset pricing model (CAPM)
- Equilibrium
- The Black-Scholes-Merton option pricing formula
- Portfolio selection in continuous time

The key theories



My ABC guide to the building blocks of financial economics:

A) Are there any “free lunches”?
B) Basic relationship between risk and reward
C) Cash flow pricing

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Are there any “free lunches”?

No!
No!
No!

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Are there any “free lunches”?

Futures market

What is the price today to buy 100 bottles of fine wine (or 100 ICI shares) for delivery in 1 year ?

= Current price + Cost of borrowing

NOT - the expected price in 1 year !!

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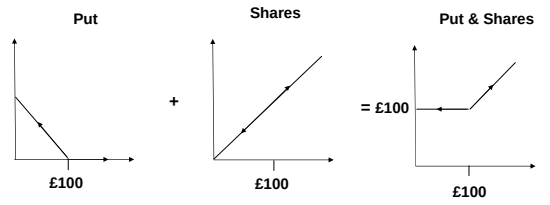
Are there any “free lunches”?

Put option - Right to Sell at a fixed price
Call option - Right to Buy at a fixed price



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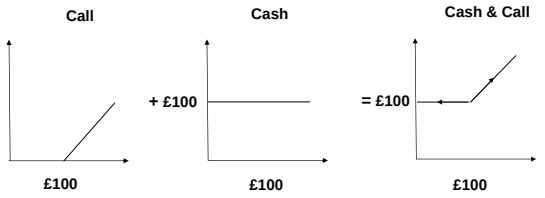
Are there any “free lunches”?



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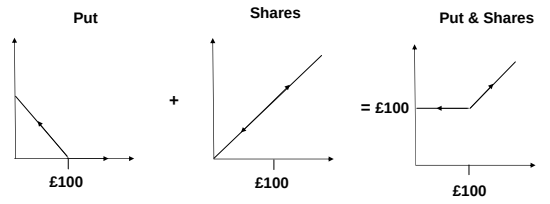

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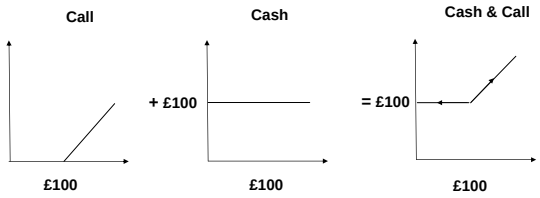

➔ Put – Call parity

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Are there any "free lunches"?

No!

The law of one price
or
No arbitrage

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Basic relationship between risk and reward

More Risk ↔ **More Reward**

Less Risk ↔ **Less Reward**

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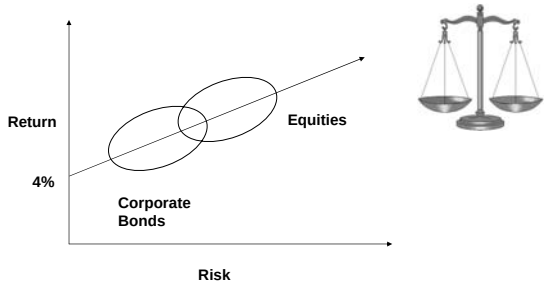
Basic relationship between risk and reward



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Basic relationship between risk and reward

Also applies over time:

Expect ever increasing return from equities over the long term

➔ Equities are increasingly risky over the long term *(check out the prices of equity put options)*

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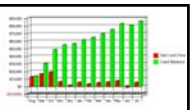
Cash flow pricing



There are no free lunches:

➔ Identical cash flows have identical market prices

Basic relationship between risk and reward:

➔Markets price cash flows by reference to the risk attached to the cash flow, the higher the risk the higher the discount rate. e.g £100 of equities = £100 of bonds

Not linked to a simple expected return:

➔ Must be risk adjusted

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The Key Papers

- **Risk and reward in corporate pension funds** – *Treynor (1972)*
- **The Pricing of Options and Corporate Liabilities** – *Black, Scholes (1973)*
- **Theory of Rational Option Pricing** – *Merton (1973)*
- **Corporate pension funding policy** – *Sharpe (1976)*
- **The tax advantages of pension fund investment in bonds** – *Black (1980)*
- **Taxation and Corporate Pension Policy** – *Tepper (1981)*
- **Pension funding and corporate valuation** – *Miller, Merton, Scholes (1981)*
- **What are corporate pension liabilities?** – *Bulow (1982)*
- **The financial theory of defined benefit pension schemes** - *Exley, Mehta, Smith (1997)*
- **Pensions, funding and risk** - *Chapman, Gordon, Speed (2001)*

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The Key Papers

- **Pension fund asset valuation and investment** – *Dyson, Exley (1995)*
- **On the risks of stocks in the long run** - *Bodie (1995)*
- **Actuaries and derivatives** – *Kemp (1997)*
- **The price of actuarial values** - *Gordon (1999)*
- **Pensions, funding and risk** - *Chapman, Gordon, Speed (2001)*
- **Reinventing pension actuarial science**– *Bader, Gold (2002)*
- **Note on the relationship between pension assets and liabilities**– *Speed, Bowie, Exley, Jones, Mounce, Ralston, Spiers, Williams (2003)*
- **Pension fund asset allocation**– *Bianco, Cooper (2003)*
- **Pension deficits – an unnecessary evil** – *Bader (2004)*
- **Through the Looking Glass: Adventures in Pension Land –** *Belt (2006)*

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The Key Applications

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The Key Applications

- DB liabilities : Pricing vs Funding
- M&As
- Investment strategies
- PPF
- Transfer Values
- DC schemes

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The Key Players

- Actuaries
- Trustees
- Members
- Employers
- Shareholders
- Analysts
- Fund managers
- Accounting Standards Boards
- Government / tPR / PPF

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What does the future hold?

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What does the future hold?

- Investment de-risking
- Changing accounting standards
- Extension of Solvency II
- Merger of pensions and insurance regulations
- Future of DB
- Changing Actuarial Profession

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