



*A way to learn
A way to earn*

Is Equal Share Really Fair?

Dave Gaskell

Rolling Stocks Investment Club

rolling.stocks@bigfoot.com

A little bit about Rolling Stocks

Rolling Stocks

Investment Club

- Formed in May 1998
- Six originating members
 - Richard W pretty experienced
 - Chris B slightly less so
 - Dave G, Kit P, Adrian B and Geoff O all interested novices
 - Geoff liked llamas !
- All IT professionals
- All worked in UK Rail (rolling stock, geddit??)
- Came together during Railtrack's Y2k project
- Still six members
 - Four of the originals
 - Two new members in 2002
- Monthly subs £100-£250 (min £25)
- Meet in a pub in Crewe (Brocklebank)
- Current net assets of £55,471
- Currently 23 holdings in portfolio
- Current profit of £1,976

A little bit about Terrington Traders

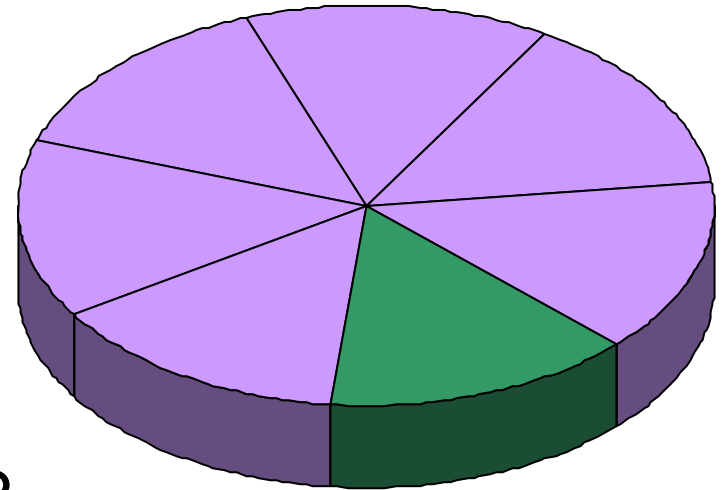
- Formed in May 2008
- Three originating members
- All live in same village in North Yorkshire (Terrington)
- Still three members (same three!)
- Meet in our homes - rotating
- Monthly subs £100 each
- Current Net Assets = £2100.84
- Current Profit = 84p
- Up on FTSE by 36% since club started !!!
- One current holding, BP, purchased this week

Outline

- Intro
- Overview of Equal Share System
- Overview of Unit Value System
- Summary of Performance measures
- Two Useful Metrics
- Summary

Equal Share Approach

- No matter how big the pie....
...all have equal share
- When new members join...
...they put in same amount



Can anyone think of a weakness?

- What if the slice is too much for the new member?
- What if an existing member wants to put more in?
- What if an existing member wants to take some out?

Equal Share - Illustration

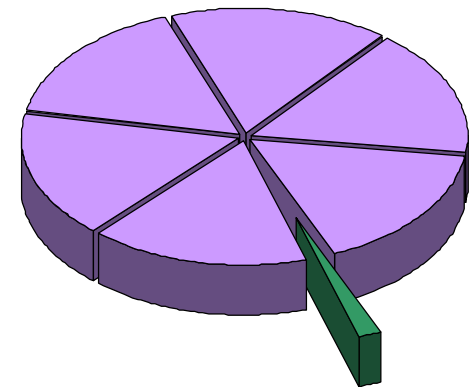
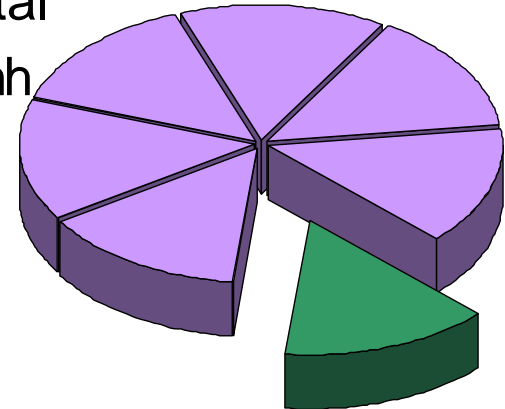
Consider a club worth £60,000 and with 6 members

A new member would need £10,000 to join !!

Would you really want to refuse new members.....
.....even if they were willing to put in £1000 or £2000?

There is another way!!

£60k total
£10k each



Unit Value System (UVS)

Needs a bit more mathematics:

$$E = hf = hc/\lambda, \quad eV_0 = hf - W, \quad E = mc^2, \quad E^2 = p^2c^2 + m^2c^4, \quad \Psi(x,t) = \int_{-\infty}^{\infty} A(k) e^{i(kx - \omega t)} dk,$$

$$p = h/\lambda, \quad \Psi(x,t) = e^{i(kx - \omega t)} \int_{-\infty}^{\infty} A(k) e^{i(kx - \omega t)(\omega - \omega_0) / (\omega - \omega_0)} dk, \quad V = \left(\frac{d\omega}{dk} \right)_{k_0}, \quad E = p^2/2m,$$

$$\Psi(x,t) = e^{i(kx - \omega t)} \int_{-\infty}^{\infty} A(k) e^{i(kx - \omega t)(\omega - \omega_0) / (\omega - \omega_0)} dk, \quad V = \left(\frac{d\omega}{dk} \right)_{k_0}, \quad \hbar \omega e^{i(kx - \omega t)} = \frac{\hbar^2 k^2}{2m} e^{i(kx - \omega t)}$$

$$E = \hbar^2 k^2 / 2m, \quad E = \hbar \omega = \hbar^2 k^2 / 2m, \quad m_{rel} = \frac{m}{\sqrt{1 - v^2/c^2}}, \quad \frac{\hbar^2}{2m} \frac{\partial^2 \Psi}{\partial x^2} = \hbar \frac{\partial \Psi}{\partial t}$$

$$\frac{\partial^2 \psi}{\partial x^2} + \frac{2m(E - V)}{\hbar^2} \psi = 0, \quad k^2 = \frac{2m(E - V)}{\hbar^2}, \quad \lambda = \frac{h}{\sqrt{2m(E - V)}}, \quad E = \frac{1}{2} k^2 \lambda^2$$

Unit Value System – The Set Up

Consider a club worth
£60,000 and with 6 members

Set a starting Unit Value

Alex wants to join and has £1000

The status after Alex joins:

Total Assets = £60,000

Member Value = £10,000

UV = 100p

Total Units = 60,000

Member Units = 10,000

Alex Units = 1,000

*(UV=100p so £1000 buys
1000 units)*

Total Assets = £61,000

UV = 100p

Total Units = 61,000

Member Units = 10,000

Alex Units = 1,000

**Q: How many units does each
Q: How many units does the club
Q: How many units does Alex buy?
have?**

UVS – Next Month (Part 1)

From previous

Last Total	=	£61,000
Total Units	=	61,000
Member Units	=	10,000
Alex Units	=	1,000

Assume assets go up 20%

New Total = £73,200

Calculate new Unit Value

$$\text{New UV} = \frac{\text{Total Assets}}{\text{Total Units}}$$
$$= 73200 \div 61000$$
$$= 120\text{p}$$

Calculate Member Allocations

(No.Units x Unit Value)

Member Alloc. = £12,000

Alex Alloc. = £1,200

UVS – Next Month (Part 2)

Members put in £100 subs

Alex puts in £200

Status at the end of the month:

How Easy Was That !!

Asset Total = £73,200
Total Units = 61,000
Member Units = 10,000
Alex Units = 1,000
Unit Value = 120p

£100 buys 83.333?units
(Subs ÷ Unit Value)

£200 buys 166.666 units

Units:

Alex = 1,166.666

Others = 10,083.333

Value:

Alex = £1,400.00

Others = £12,100.00

Equal Share v Unit Value System

Equal Share Approach

- Simple to implement and manage
- Complete Lack of Flexibility:
 - New member joining – pay and catch up
 - Can't increase or reduce monthly subscription
 - Everyone must or nobody can
 - Can't handle one-off top-ups
 - Everyone must or nobody can
 - Can't handle people withdrawing some funds
 - Everyone must or nobody can

Equal Share v Unit Value System

Unit Value Approach

- **Completely Flexible**
 - New members can join at any level
 - Everyone can have different monthly sub amounts
 - Can allow individuals to put extra in at any time
 - Can allow individuals to take some out
- **Needs a bit more maths....but**
 - ✓ Easy in a spreadsheet
 - ✓ Most Treasurer software packages handle it (COW, TTT, etc.)
 - ✓ Once done for a month or two – it's easy.

Measuring Performance

Let's focus on investment performance,

So we

1. Invest in the club – monthly subs
2. Make investment decisions
3. Buy/sell shares (or other alternatives)
4. Measure performance

Performance Measures

Total Assets

- The sum....
Total Assets = Total Assets

	Total Asset
Jan-08	£66,323.91
Feb-08	£70,421.36
Mar-08	£70,786.74
Apr-08	£75,360.92
May-08	£77,543.30
Jun-08	£77,791.66
Jul-08	£76,144.04
Aug-08	£71,894.98
Sep-08	£71,938.18
Oct-08	£74,899.59
Nov-08	£72,287.66

But....

- Club A has £20,000
- Club B has £10,000
- Is Club A doing twice as well as B?
- What about profit?

Performance Measures

Profits

- Profit = Total Assets – Cash In

	Total Asset	Cash In	Profit
Jan-08	£66,323.91	£33,000.00	£33,323.91
Feb-08	£70,421.36	£34,000.00	£36,421.36
Mar-08	£70,786.74	£35,000.00	£35,786.74
Apr-08	£75,360.92	£36,000.00	£39,360.92
May-08	£77,543.30	£37,000.00	£40,543.30
Jun-08	£77,791.66	£38,000.00	£39,791.66
Jul-08	£76,144.04	£39,000.00	£37,144.04
Aug-08	£71,894.98	£40,000.00	£31,894.98
Sep-08	£71,938.18	£41,000.00	£30,938.18
Oct-08	£74,899.59	£42,000.00	£32,899.59
Nov-08	£72,287.66	£43,000.00	£29,287.66

But....

- Club C has £10,000 profit
- Club D has £5,000 profit
- Is Club C doing twice as well as D?
- What if Club C has paid in £100,000, Club D £50000?

Performance Measures

Return On Investment

- $$\text{ROI} = \frac{\text{Profit}}{\text{Cash In}}$$

	Total Asset	Cash In	Profit	ROI
Jan-08	£66,323.91	£33,000.00	£33,323.91	101.0%
Feb-08	£70,421.36	£34,000.00	£36,421.36	107.1%
Mar-08	£70,786.74	£35,000.00	£35,786.74	102.2%
Apr-08	£75,360.92	£36,000.00	£39,360.92	109.3%
May-08	£77,543.30	£37,000.00	£40,543.30	109.6%
Jun-08	£77,791.66	£38,000.00	£39,791.66	104.7%
Jul-08	£76,144.04	£39,000.00	£37,144.04	95.2%
Aug-08	£71,894.98	£40,000.00	£31,894.98	79.7%
Sep-08	£71,938.18	£41,000.00	£30,938.18	75.5%
Oct-08	£74,899.59	£42,000.00	£32,899.59	78.3%
Nov-08	£72,287.66	£43,000.00	£29,287.66	68.1%

But....

- Club E has 50% ROI
- Club F has 25% ROI
- Is Club E doing twice as well as F?
- What if Club E started 10 years ago and Club F 1 month ago?

Performance Measures

Time Weighted Return

- Unit Value

	Total Asset	Cash In	Profit	ROI	UV
Jan-08	£66,323.91	£33,000.00	£33,323.91	101.0%	805.257
Feb-08	£70,421.36	£34,000.00	£36,421.36	107.1%	846.81
Mar-08	£70,786.74	£35,000.00	£35,786.74	102.2%	843.087
Apr-08	£75,360.92	£36,000.00	£39,360.92	109.3%	887.741
May-08	£77,543.30	£37,000.00	£40,543.30	109.6%	903.731
Jun-08	£77,791.66	£38,000.00	£39,791.66	104.7%	896.428
Jul-08	£76,144.04	£39,000.00	£37,144.04	95.2%	867.359
Aug-08	£71,894.98	£40,000.00	£31,894.98	79.7%	807.567
Sep-08	£71,938.18	£41,000.00	£30,938.18	75.5%	796.82
Oct-08	£74,899.59	£42,000.00	£32,899.59	78.3%	818.546
Nov-08	£72,287.66	£43,000.00	£29,287.66	68.1%	779.073

But....

- Club G has Unit Value of 200p
- Club H has Unit Value of 100p
- Is Club G doing twice as well as H?

Performance Measures

Illustrative Example:-

- Clubs A and B start up. £1000 assets. $UV=100$
- Club A invests £1000 and trebles overnight
 - Assets = £3000, $UV = 300$
- Club B invests £1000 and drop by 66% overnight
 - Assets = £333, $UV = 33.33$
- Few months pass both clubs put £9000 in
 - Club A Assets = £12000, $UV = 300$
 - Club B Assets = £9333, $UV = 33.33$
- Club A shares halve in value, Club B's double
 - Club A Assets = £6000, $UV = 150$
 - Club B Assets = £18,666, $UV = 66.66$

Performance Measures

Money Weighted Return

- Internal Rate Of Return

	Total Asset	Cash In	Profit	ROI	UV	IRR
Jan-08	£66,323.91	£33,000.00	£33,323.91	101.0%	805.257	21.09%
Feb-08	£70,421.36	£34,000.00	£36,421.36	107.1%	846.81	22.04%
Mar-08	£70,786.74	£35,000.00	£35,786.74	102.2%	843.087	21.50%
Apr-08	£75,360.92	£36,000.00	£39,360.92	109.3%	887.741	22.46%
May-08	£77,543.30	£37,000.00	£40,543.30	109.6%	903.731	22.49%
Jun-08	£77,791.66	£38,000.00	£39,791.66	104.7%	896.428	21.81%
Jul-08	£76,144.04	£39,000.00	£37,144.04	95.2%	867.359	20.49%
Aug-08	£71,894.98	£40,000.00	£31,894.98	79.7%	807.567	18.13%
Sep-08	£71,938.18	£41,000.00	£30,938.18	75.5%	796.82	17.40%
Oct-08	£74,899.59	£42,000.00	£32,899.59	78.3%	818.546	17.75%
Nov-08	£72,287.66	£43,000.00	£29,287.66	68.1%	779.073	17.38%

- Takes timing of cash-flows into account
- More difficult to calculate
 - But Excel does it for you (XIRR function)

Two Useful Metrics

1. Would I have been better off putting my money in the bank?

- Use the Internal Rate Of Return
- Can compare directly against bank interest rate

2. Would our investment decisions have beaten a FTSE tracker?

- Use the Unit Value
- Can compare directly against FTSE (rebased)

Summary

Scheme	Good	Not good
UVS	Flexible	More work – valuation
Equal Share	Ease of use and maintain	Very restrictive

Use multiple metrics to measure performance

Club Links

- Rolling Stocks investment club:
<http://www.rollingstocks.co.uk/>



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