New thinking on performance evaluation

Robin Penfold

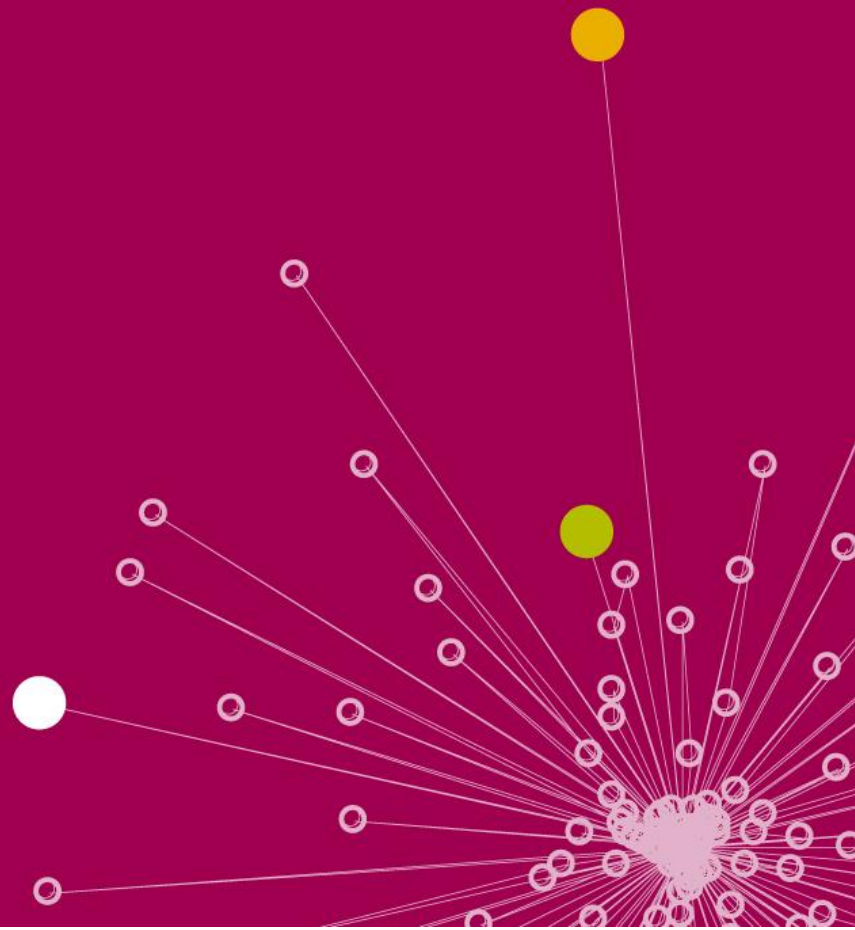
International Congress of Actuaries
Washington, DC | 30 March – 4 April 2014

TOWERS WATSON

Standard performance evaluation has a problem

- Why?
- How big is it?
- What can we do about it?

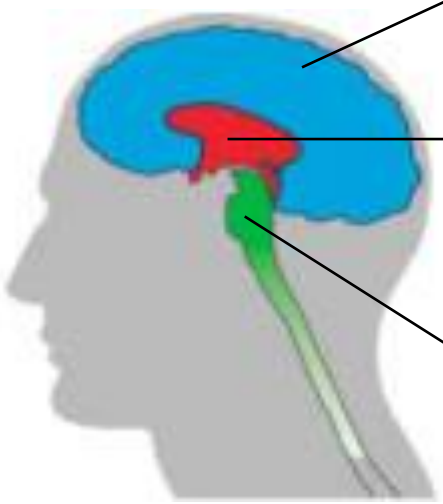
Why is there a problem?



TOWERS WATSON

We ‘lose our heads’ with underperformance

‘Induce downshift’



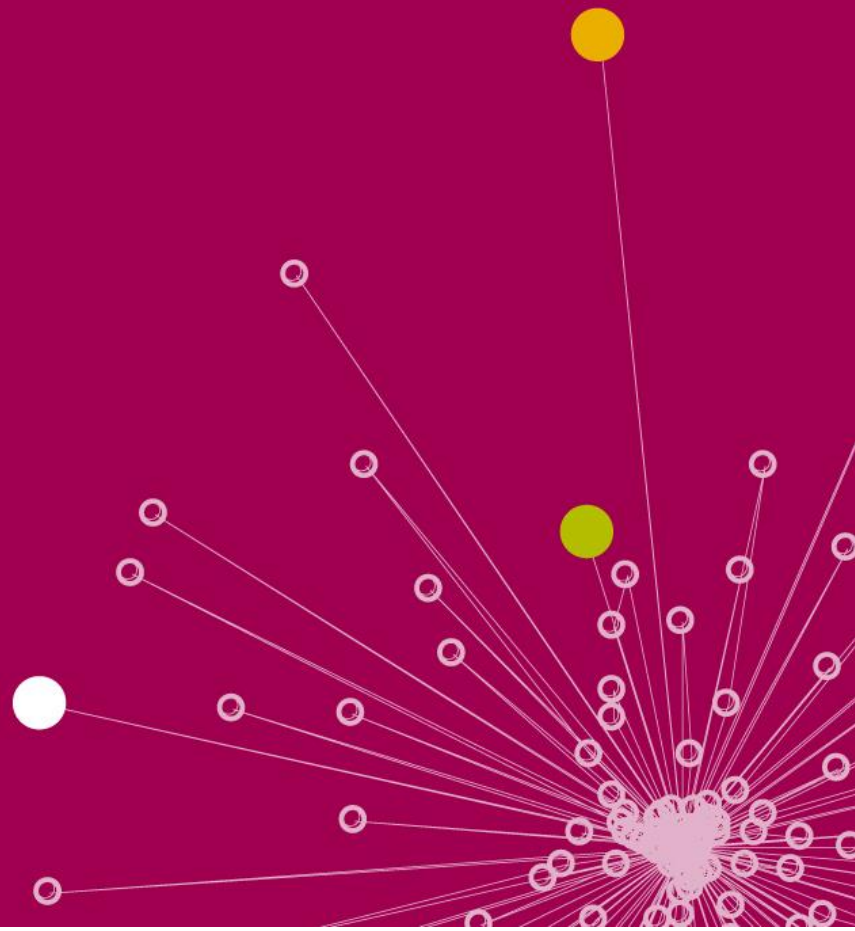
Hominid brain

Mammalian brain

Reptilian brain

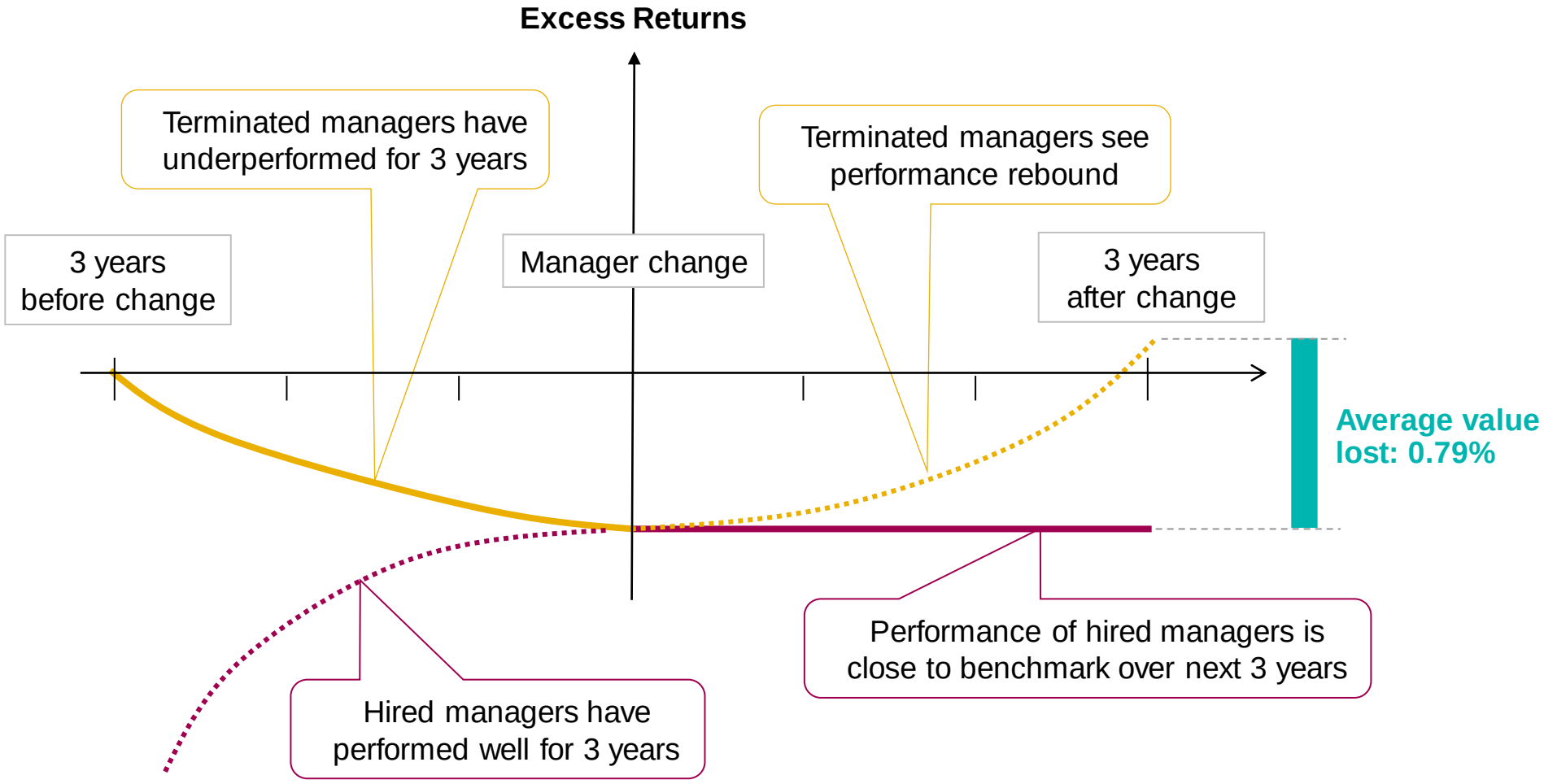
Source: Andrew Lo and Towers Watson

How big is the problem?



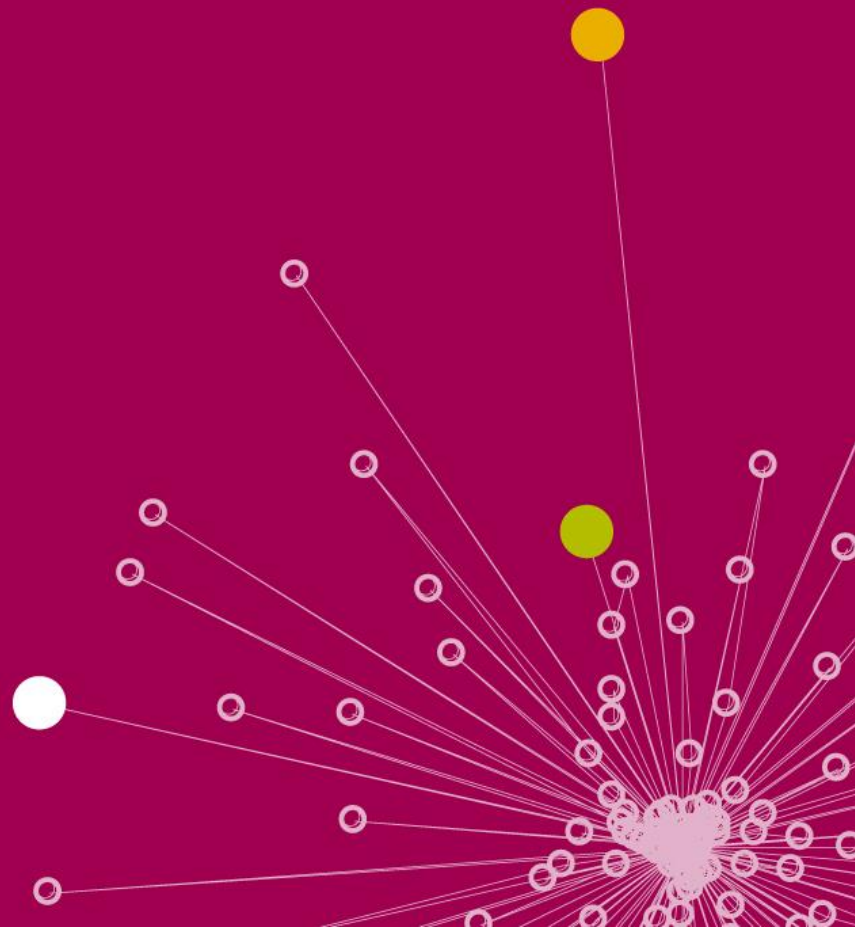
TOWERS WATSON

Round-trip transitions by US plan sponsors



Source: Goyal and Wahal, The Journal of Finance, August 2008. (<331 decisions)

What can we do about the problem?

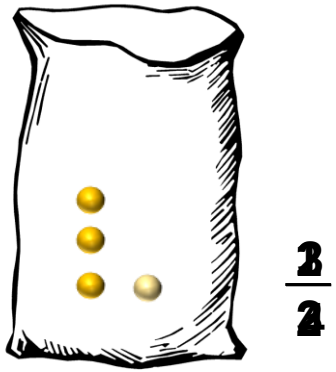


TOWERS WATSON

Why do we do this?

Rehearse a response before you experience the emotional stress

Ted, the precocious Bayesian updater



$$\frac{3}{4}$$

Illustration, via The Economist

Two types of managers

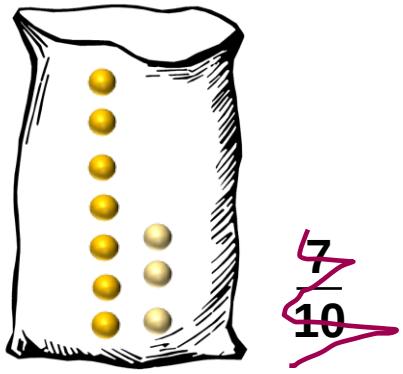
	Stars	Flops
Expected net excess return	**1% pa**	**-1% pa**
Tracking error	**3% pa**	**3% pa**

Deriving the expected alpha of Stars and Flops

- Sharpe's Arithmetic of Active Management
  - $\pi_s\{\boldsymbol{E}(\alpha_s) + c\} + (1 - \pi_s)\{\boldsymbol{E}(\alpha_f) + c\} = 0$
    - π_s – the proportion of Stars (eg 15%, partly from Barras et al)
    - *c* – the cost of investing (eg 0.67% a year, from French)
  - $\boldsymbol{E}(\alpha_f) = -\left[\frac{c+\pi_s \boldsymbol{E}(\alpha_s)}{(1-\pi_s)}\right]$ (ie -1.0% a year)

You, the Bayesian updater

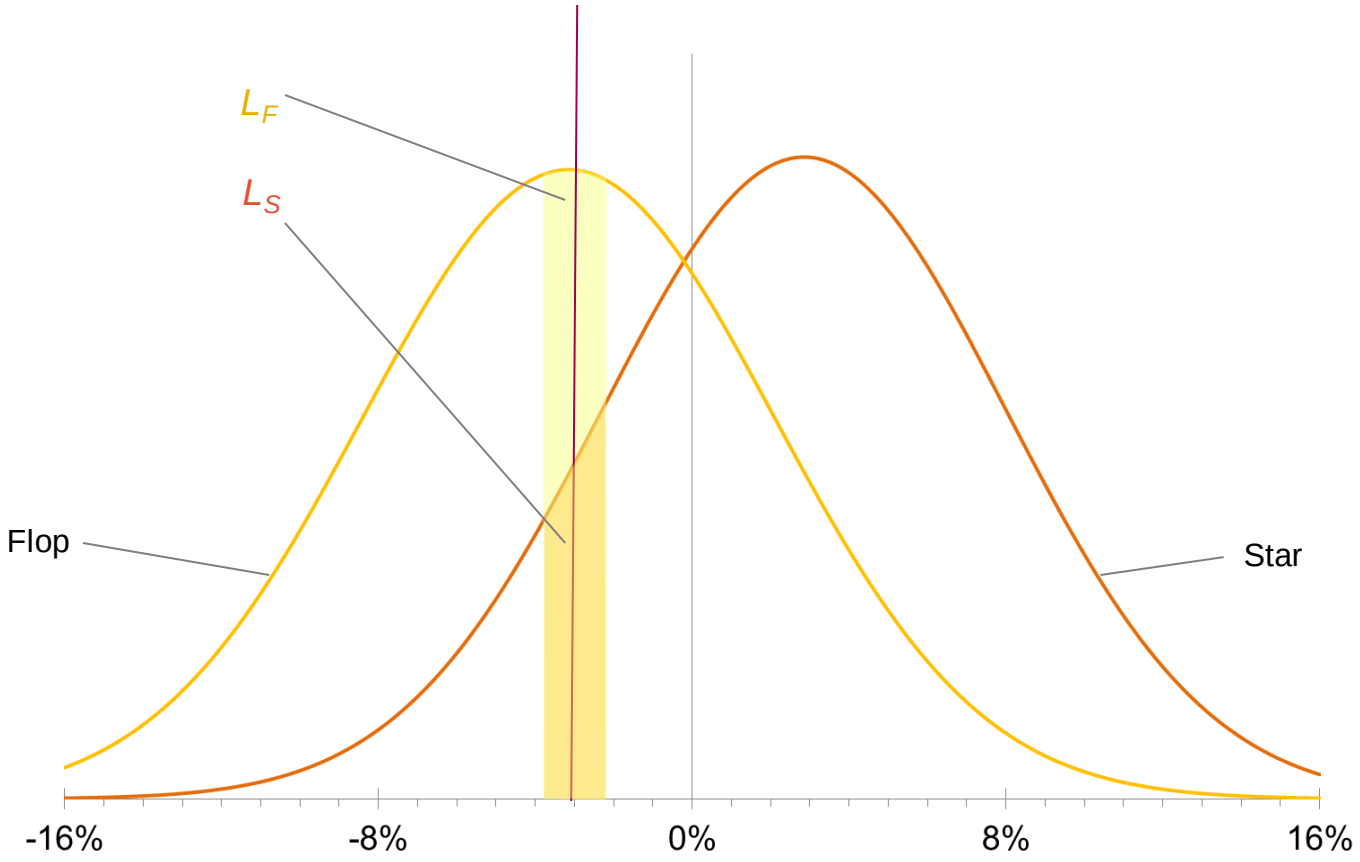
2014



More specifics

- **In 2011, annual expected excess return is:**
  - (70% of Star, at +1%) plus (30% of Flop, at -1%)
    - In other words, 0.4%
- **Last 3 years: manager underperformed by -1% pa**
  - In-line with what was expected of a Flop
  - Below the 1% pa that was expected from a Star

Bayesian updating, from P_O (70%) to P_N



$$P_N = \frac{L_S P_O}{L_S P_O + L_F (1 - P_O)} = 55\%$$

Did Stephen initially pick a Star?

- **Probably …**
  - 55% likelihood, not 70% likelihood
- **Lower expected outperformance**
  - (55% of +1%) plus (45% of -1%)
  - **0.1% pa** (not 0.4% pa)

Outcomes depend upon two factors

	50%	70%	90%
-6%	-1.0%	-1.0%	-0.8%
-5%	-1.0%	-0.9%	-0.6%
-4%	-0.9%	-0.8%	-0.3%
-3%	-0.8%	-0.6%	0.0%
-2%	-0.6%	-0.3%	0.4%
-1%	-0.4%	0.1%	0.6%
0%	0.0%	0.4%	0.8%
1%	0.3%	0.6%	0.8%
2%	0.5%	0.7%	0.9%
3%	0.7%	0.8%	0.9%
4%	0.8%	0.9%	0.9%
5%	0.9%	0.9%	0.9%
6%	0.9%	0.9%	0.9%

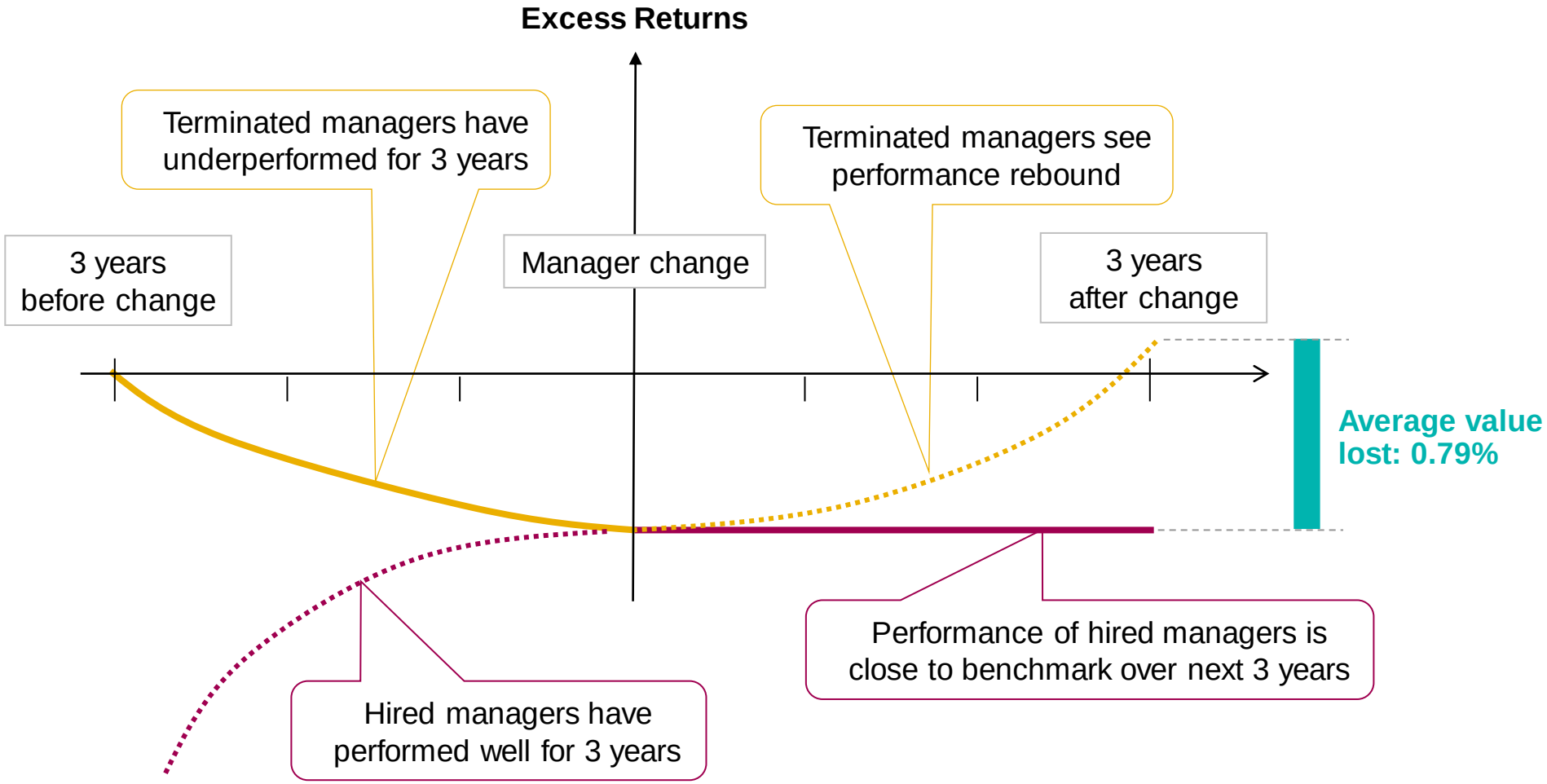
Replace

Retain

Investor's initial belief that Stephen picked a Star

Excess return of the manager in the last three years

Need to reflect mean-reversion of excess returns



Source: Goyal and Wahal, The Journal of Finance, August 2008. (<331 decisions)

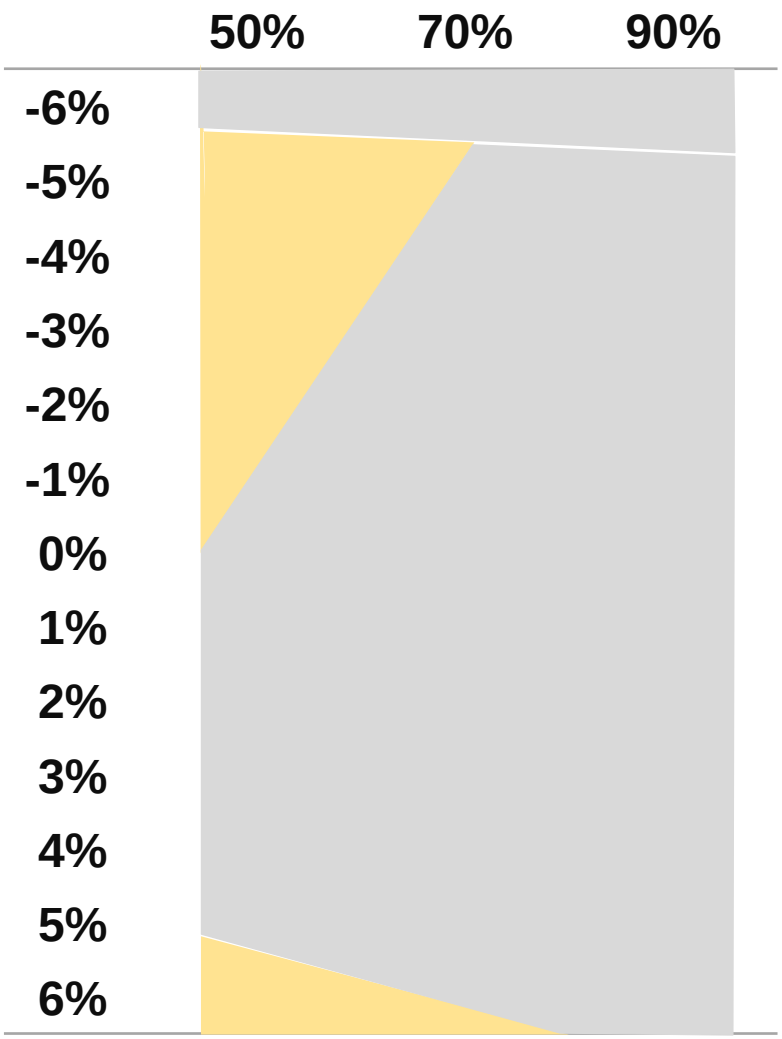
Example with mean reversion of excess returns

- **70% initial likelihood → 55% revised likelihood**
- **Expected excess return of a Flop this period:**
  - Still -1.0% pa, as it performed as expected last period
- **Expected excess return of a Star this period:**
  - Higher than before, given last period's disappointment
  - 1.0% pa → 1.3% pa
- **Expected excess return is 0.3% pa for next period**
  - Not 0.1% pa

Outcomes when excess returns mean-revert

	50%	70%	90%
-6%	0.0%	0.0%	0.2%
-5%	-0.2%	-0.1%	0.3%
-4%	-0.3%	-0.1%	0.4%
-3%	-0.4%	-0.1%	0.6%
-2%	-0.4%	0.1%	0.8%
-1%	-0.2%	0.3%	0.9%
0%	0.0%	0.4%	0.9%
1%	0.1%	0.5%	0.8%
2%	0.2%	0.5%	0.7%
3%	0.3%	0.4%	0.5%
4%	0.2%	0.3%	0.3%
5%	0.1%	0.1%	0.2%
6%	-0.1%	0.0%	0.0%

Outcomes when excess returns mean-revert



Hang tight (add)

Sufficient level of discomfort

Insufficient level of discomfort

Take profits (trim)

How does this approach help us?

- **Investors can rehearse their response to underperformance before they feel stressed**
  - Less likely to fire managers for performance reasons?
  - May trim a manager's portfolio if it performs very well
- **Describes what matters in manager evaluation**
  - Investor's belief on the mean-reversion of the manager's excess returns
  - Investor's confidence in its consultant

But this is only a (two-factor) model

- **Usual caveats apply**
  - Don’t fail the Derman test:
    - Believe “that someone can write down a theory that encapsulates human behaviour and thereby free you of the obligation to think for yourself ”
  - Use the model alongside other inputs
  - Recognise that the model is far better at providing a guide to sensitivities than stating ‘the answer’

Limitations of reliance

Towers Watson has prepared this presentation for general information and education purposes only.
No action should be taken based on this document as it does not include any detailed analysis into your own scheme specifics.

This document is provided to the recipients solely for their use, for the specific purpose indicated. This document is based on information available to Towers Watson at the date of the document and takes no account of subsequent developments after that date. It may not be modified or provided to any other party without Towers Watson's prior written permission. It may also not be disclosed to any other party without Towers Watson's prior written permission except as may be required by law. In the absence of our express written agreement to the contrary, Towers Watson accepts no responsibility for any consequences arising from any third party relying on this document or the opinions we have expressed. This document is not intended by Towers Watson to form a basis of any decision by a third party to do or omit to do anything.

Please note that investment returns can fall as well as rise and that past performance is not a guide to future investment returns.
Towers Watson is authorised and regulated by the Financial Conduct Authority.

Contact Details
Robin Penfold, Towers Watson
robin.penfold@towerswatson.com