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# **Modelling the Risk, Return and Resiliency of Future Dairy Farm Systems**

Mark Neal, Simon Cooper

Contributed presentation at the 60th AARES Annual Conference,  
Canberra, ACT, 2-5 February 2016

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Profitability. Sustainability. Competitiveness.

# Modelling the Risk, Return and Resiliency of Future Dairy Farm Systems

Mark Neal, Simon Cooper

# Resilience

- *What doesn't kill you makes you stronger*
- “...farming systems are probably too complex and variable in space and time for resilience models to provide specific, or even closely predictive, guidance to farmers”

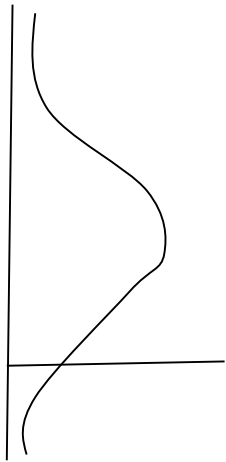
# To what? From what?

- Resilience of the farm business
- To financial shocks
  - Affecting solvency/liquidity
- Can be price, production, financial, institutional

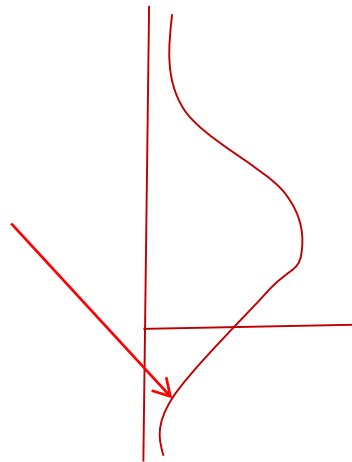
# To Bounce without Breaking

- Post-shock two year cash flow
- Bad year (1 in 10), followed by
- Distribution of all returns (or conditional)

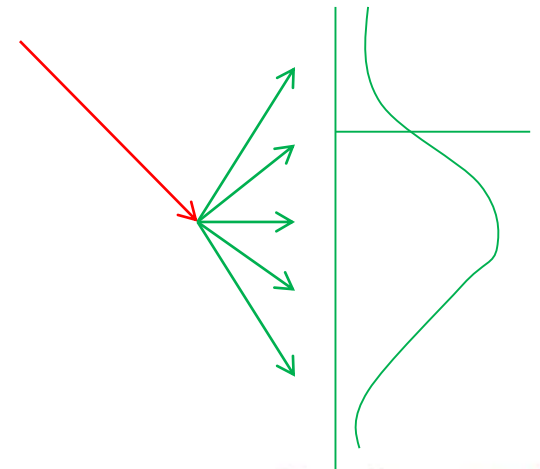
Return on assets ->



Cash surplus ->



Two-year cash surplus

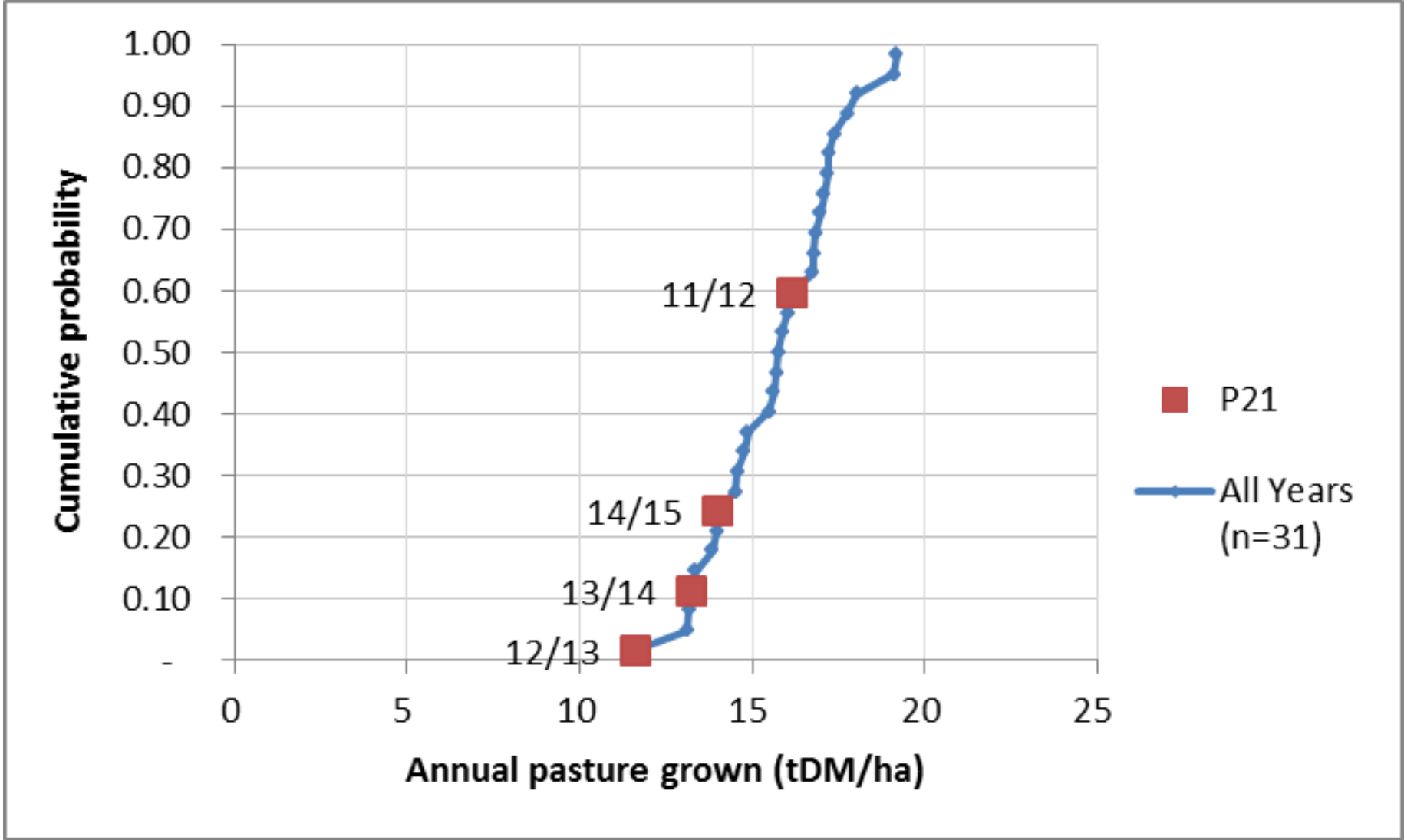


# Case study: Pastoral 21

- System change
  - Similar profit
  - Lower nitrate leaching
- Lower stocking rate
  - Higher per cow

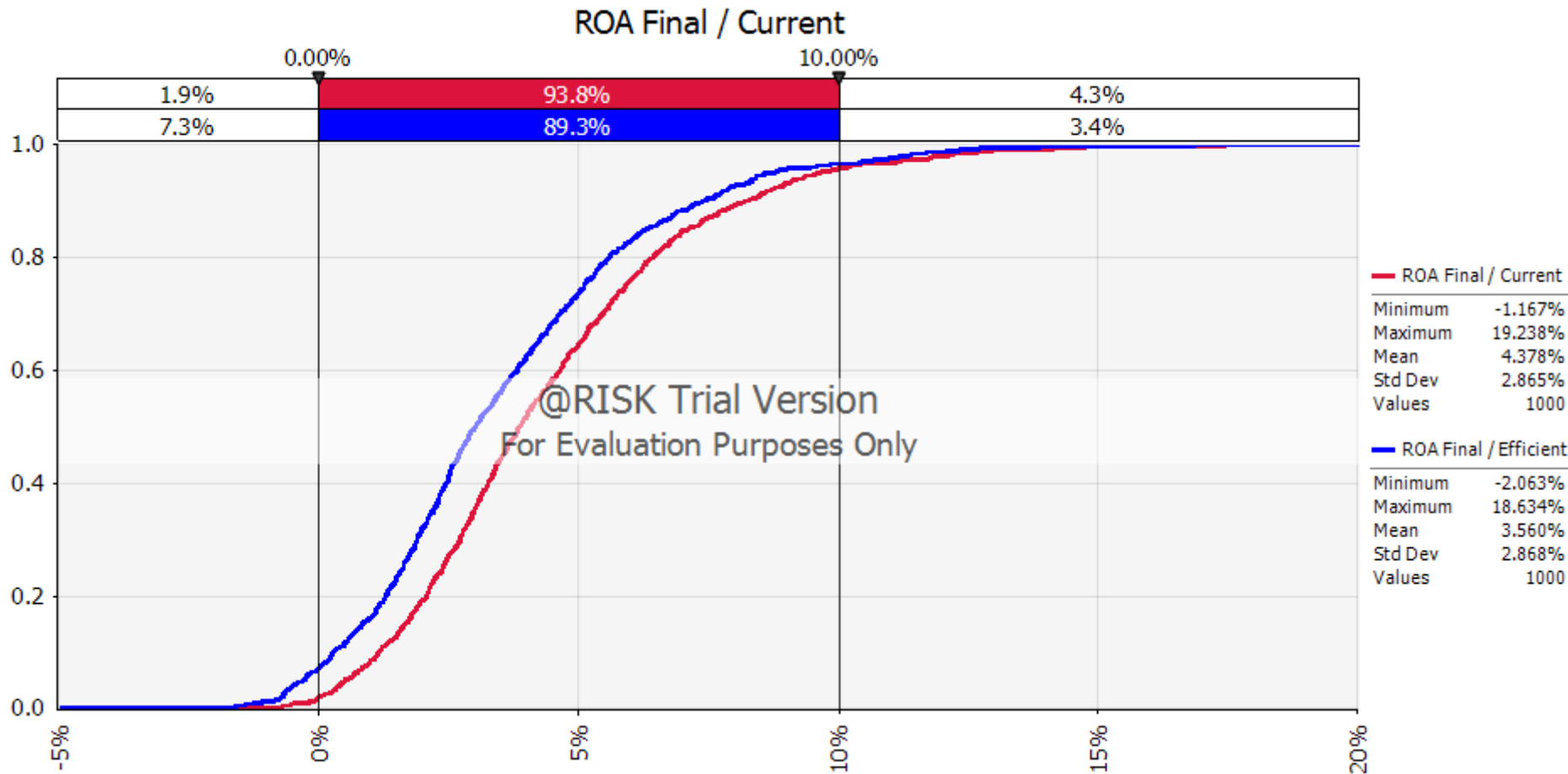


# Waikato Pasture Production



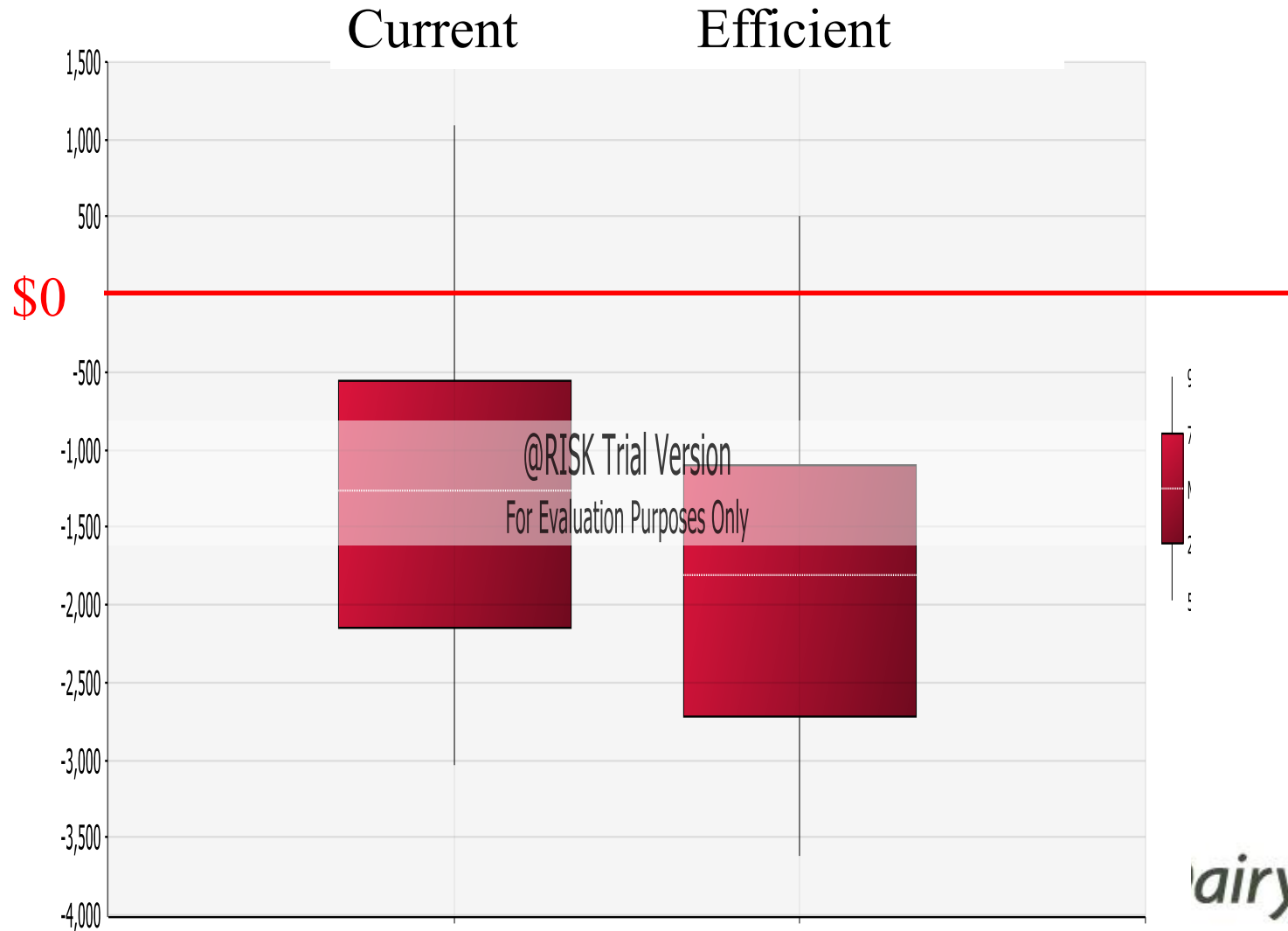


# CDF of ROA: Waikato



# Post-shock two year cash surplus

## Waikato



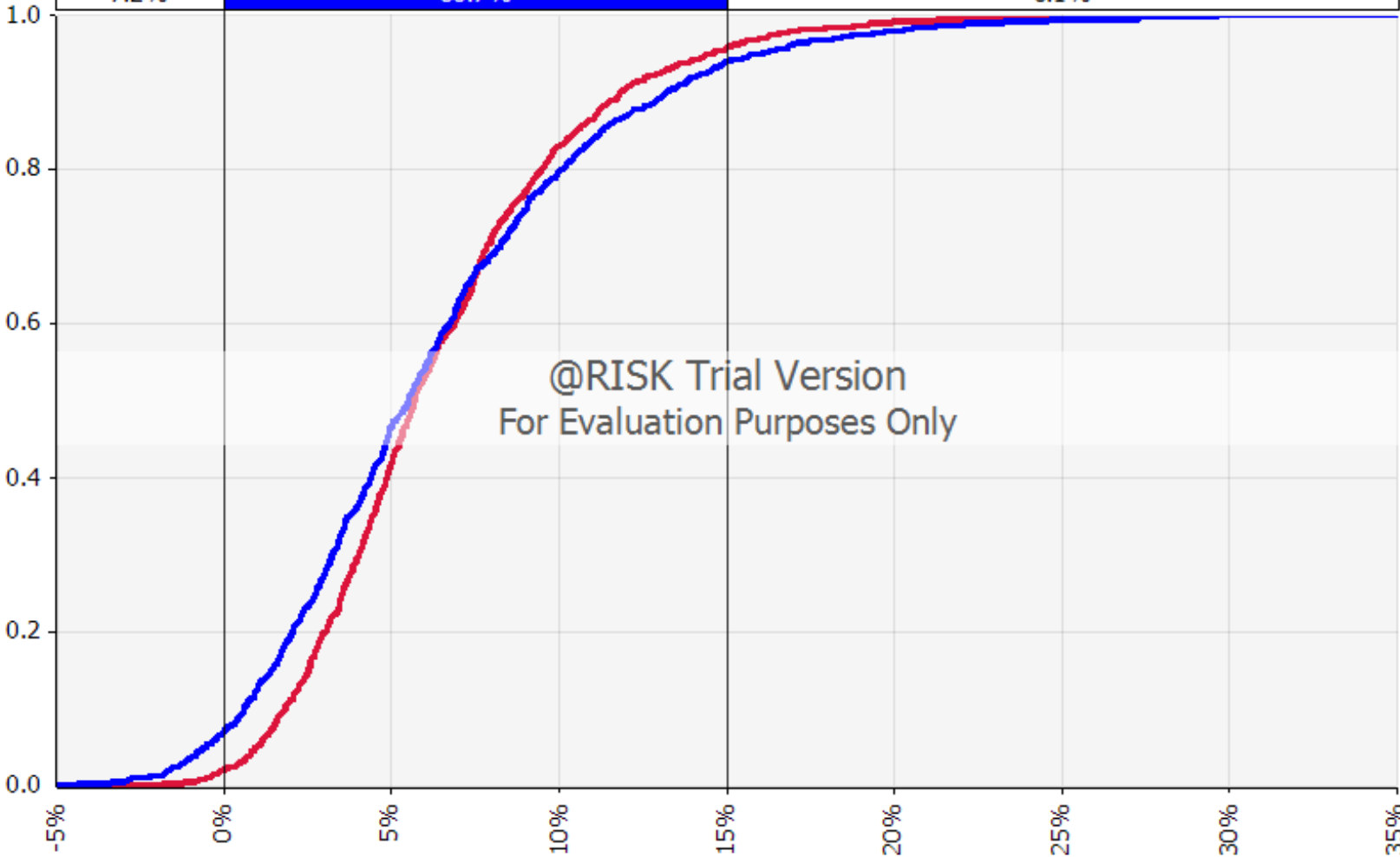
# CDF of ROA: Canterbury

ROA Final C / LSE

0.00%

15.00%

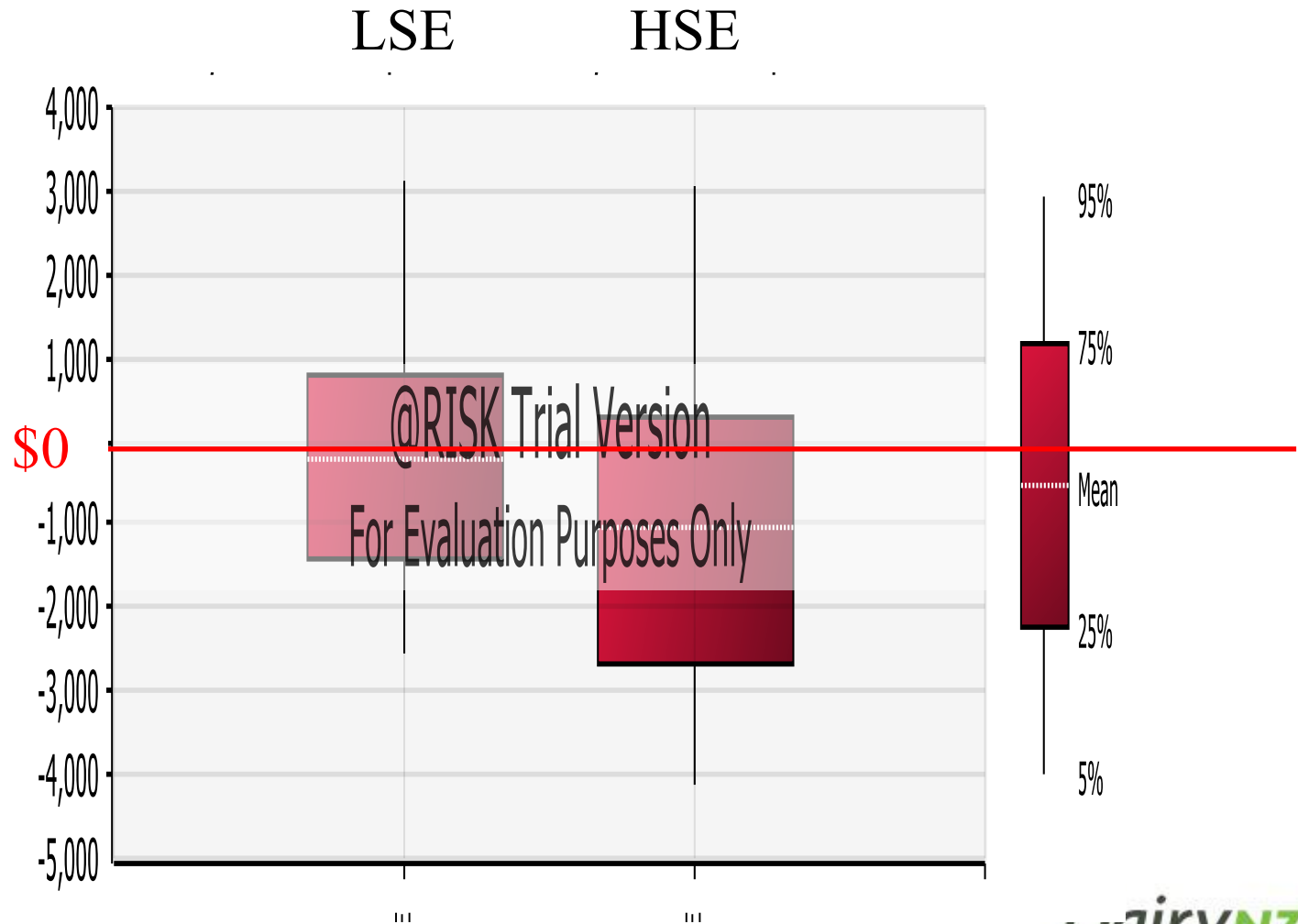
2.1%	93.8%	4.1%
7.2%	86.7%	6.1%



—	ROA Final C / LSE
Minimum	-2.148%
Maximum	28.984%
Mean	6.439%
Std Dev	4.191%
Values	1000
—	ROA Final C / HSE
Minimum	-4.513%
Maximum	33.274%
Mean	6.295%
Std Dev	5.197%
Values	1000

# Post-shock two year cash surplus

## Canterbury



# Conclusions

- Resilience with 2 year cash flow
  - Lower tail of cash flows...
  - Reduced profitability...
  - Compound to reduce resilience
- Monte Carlo
  - Ease of use...
  - Needs thought