

Dairy Revenue Risk Management

Milk Price Futures Presentation

Nigel Atherfold

November 2016

TDB
ADVISORY

Corporate
Finance &
Economics
Expertise

Disclaimer

- The information contained in this presentation reflects the views and opinions of TDB Advisory Limited and is provided for information only.
- TDB Advisory Limited is not a provider of an investment advisory service.
- Although the information provided in the presentation is, to the best of our knowledge and belief correct, TDB Advisory Limited, its directors, employees and related parties accept no liability or responsibility for any loss, damage, claim or expense suffered or incurred by any party as a result of reliance on the information provided and opinions expressed in this presentation, except as required by law. It is each user's responsibility to verify all information provided before making a final decision or commitment.
- The modeling outcomes presented represent expected outcomes and do not guarantee actual future outcomes. Note that historic outcomes are not necessarily an indication of future outcomes.

Contents

1. Background
2. Introduction
3. Context
4. Forecasting
5. Optimisation
6. What's the problem?
7. What do we want?
8. How can we achieve that?
9. Issues / considerations
10. Policy
11. What are the mechanics?
12. Summary

Background

- TDB Advisory
 - Treasury risk management
 - Corporate finance
 - Economic analysis
- NZDB / Fonterra
- Role within the dairy sector to date
 - Treasury risk management policy development
 - Execution of policy
 - Market commentary
 - Independent director
 - Advisory board member
 - Education – banks / farmers / associations

Introduction

- Risk management
 - More certainty around a particular outcome
 - Protect the downside
 - Probability x consequence
 - Used in conjunction with volume decisions to optimise revenue
 - Price x quantity
 - Profit is maximised where marginal revenue = marginal cost
 - Time to adjust

Introduction

- Risk management policies – applied to **material exposures** to variables that **cannot** be controlled or forecast
- **Commodities, by definition, cannot be controlled or forecast**
- Position of “least regret” – some protection on the way down and some participation on the way up

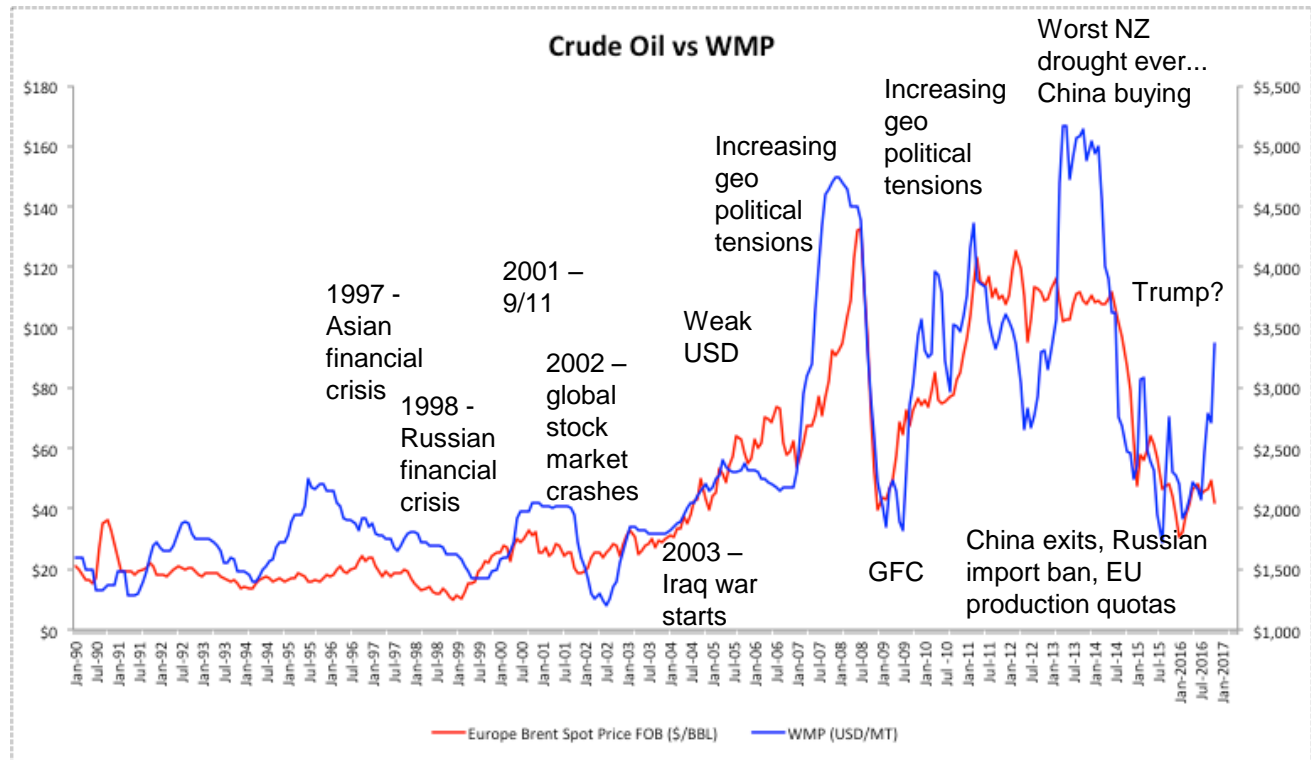
Introduction

- **Optimise not maximise** – that is, the risk versus return trade off
- Sufficient certainty against which to make some good production decisions

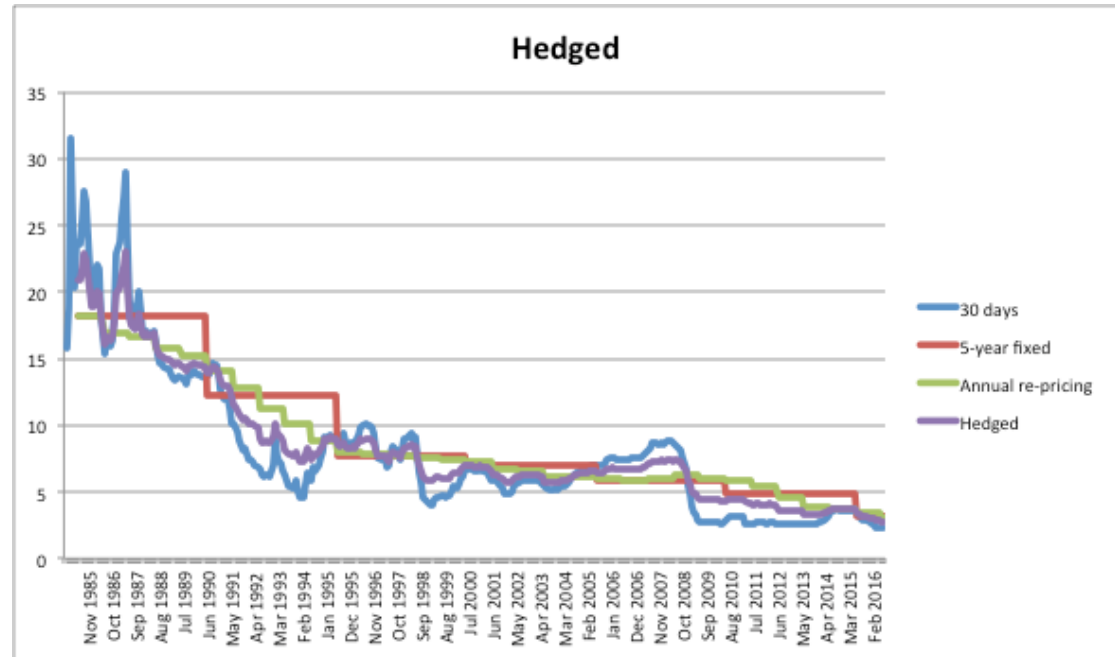
Context

- Total global milk production
 - 735 billion litres
- Total internationally traded milk
 - 65 billion litres
- Total internationally traded milk
 - < 10% of total production
 - ie. most countries' production is consumed domestically
- Total New Zealand milk production
 - 21 billion litres
- Total consumed domestically \approx 5%
- Total exported \approx 95%
- Total share of international trade \approx 30%
- Commodity markets = price taker

Forecasting - WMP



Optimisation - interest rate risk

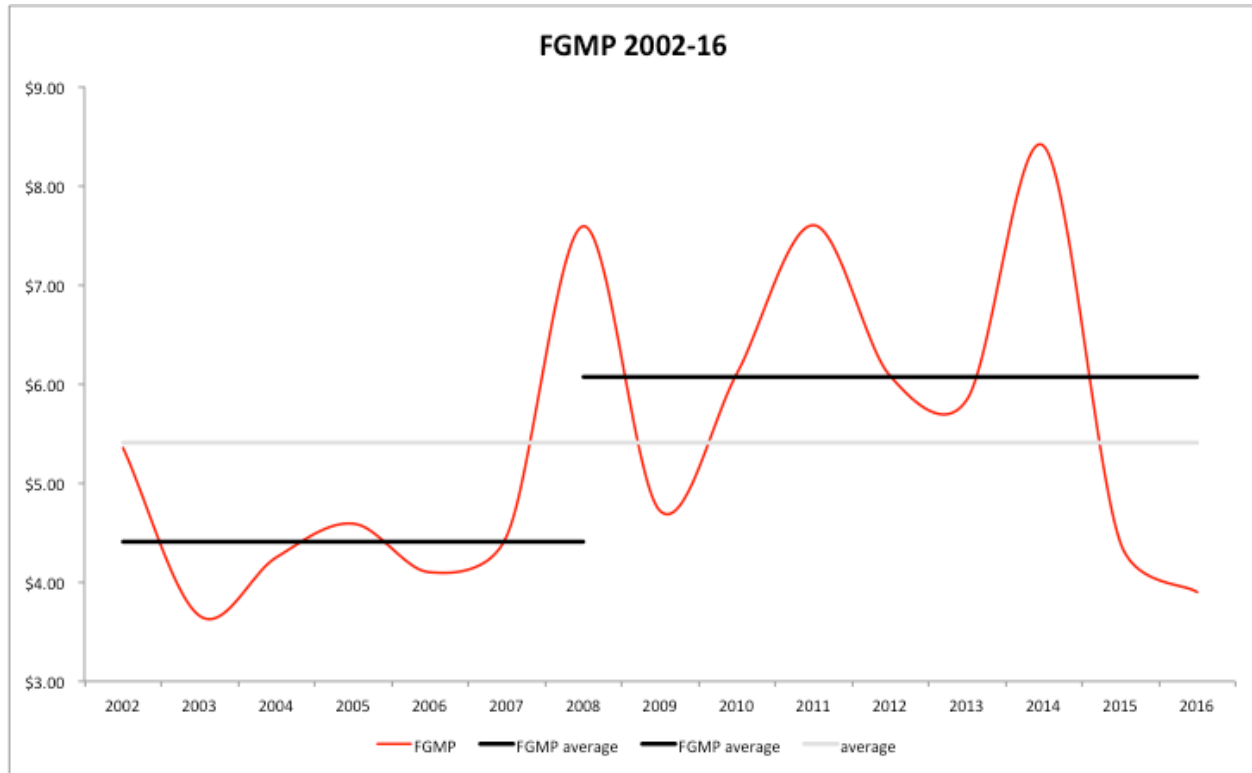


	Floating	5-Year Fixed	5-Year Fixed Re-Priced Annually	Smoothed
Average Interest Rate	7.9%	9.1%	8.6%	8.3%
Standard Deviation	5.3%	4.7%	4.2%	4.6%
Minimum Interest Rate	2.3%	3.2%	3.1%	2.7%
Maximum Interest Rate	29.0%	18.2%	18.2%	23.0%

Optimisation - interest rate risk

	Floating	5-Year Fixed	5-Year Fixed Re- Priced Annually	Smoothed
Average Interest Rate	7.9%	9.1%	8.6%	8.3%
Standard Deviation	5.3%	4.7%	4.2%	4.6%
Minimum Interest Rate	2.3%	3.2%	3.1%	2.7%
Maximum Interest Rate	29.0%	18.2%	18.2%	23.0%

What's the problem?



- Volatility
 - FGMP \$8.40 → \$4.40 → \$3.90
 - Average \$5.60

How big is the problem?

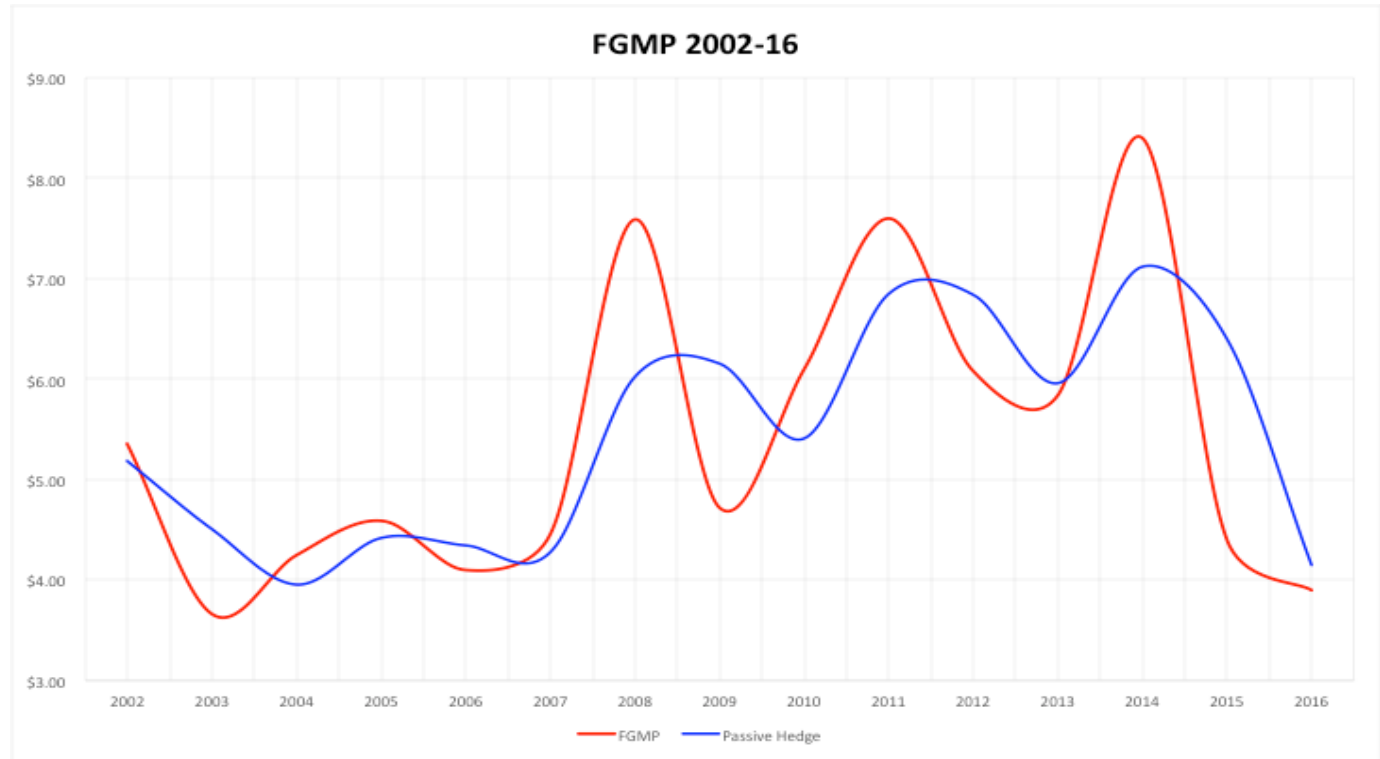
- Average NZD WMP price since 07/08
 - \$4,630
- Standard deviation
 - \$1,235
- Average FGMP since 07/08
 - \$6.07
- Standard Deviation
 - \$1.48
 - Roughly speaking*
 - Half the time the FGMP is less than \$6.07
 - 16% of the time the FGMP is less than \$4.59

*Assuming a normal distribution curve. If the distribution curve is skewed to the left, it's a bigger problem!!

What's the other problem?

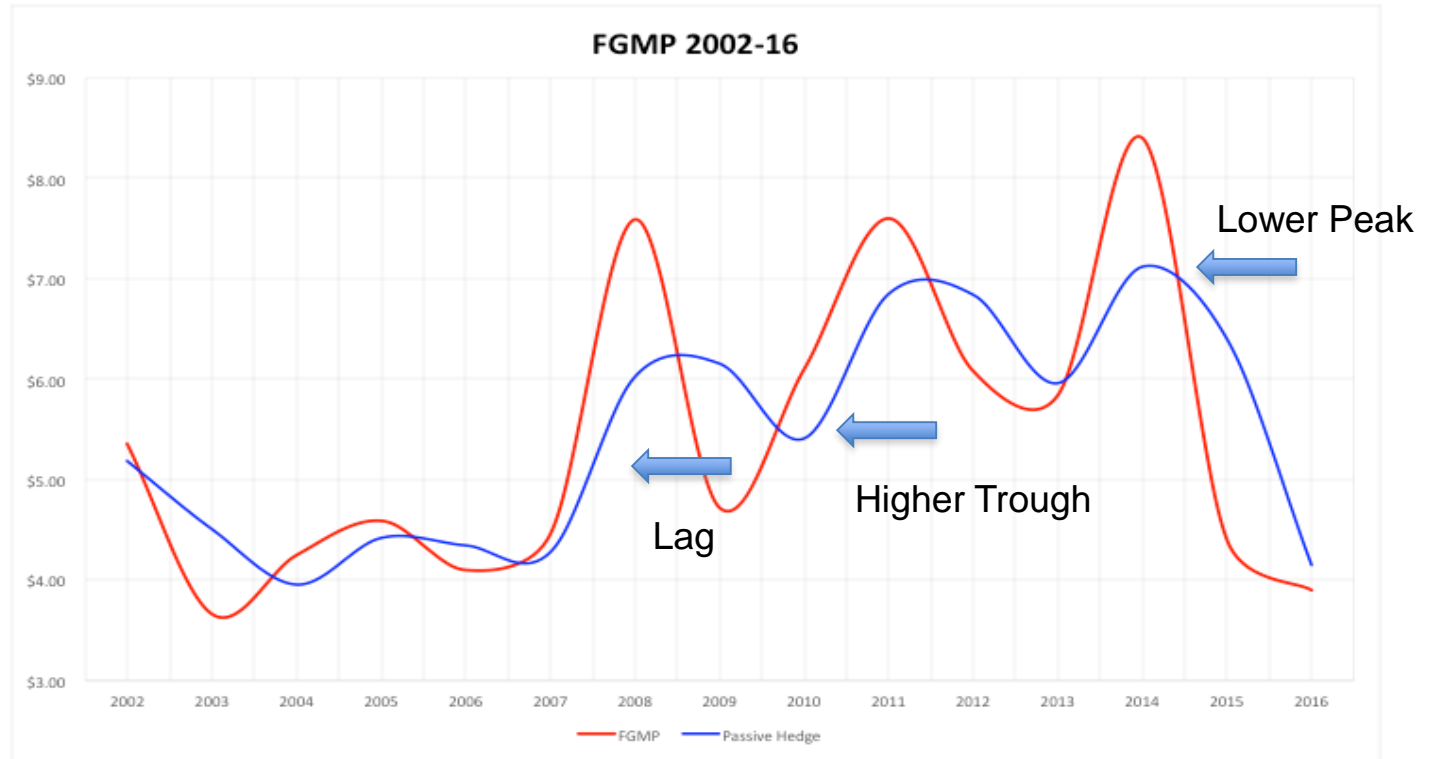
	Opening Forecast	Actual
▪ 2014	\$7.00	\$8.40
▪ 2015	\$7.00	\$4.40
▪ 2016	\$5.25	\$3.90
▪ 2017	\$4.25	

What do we want?



- Risk - \$1.49 versus \$1.11

What do we want?



How can we achieve that?

- Futures - an agreement between a buyer and a seller at a price agreed today for payment at a specified future date
 - Standardised product
 - Specified quantity – 6,000 kgMS
 - Deliverable vs non-deliverable
 - Cash for differences – net settled – yes

How can we achieve that?

- Contracted through an intermediary – NZX
 - Parties are anonymous
 - Credit risk
- Reference price
 - FGMP
- Basis risk
 - “milk price” futures

Issues / considerations

- Risk aversion – how much risk can the entity take?
- Strategy – target a smoothed outcome or target a specific outcome?
- Low futures prices – how do you start hedging when futures prices are so low?
- Basis risk – minimal with milk price futures

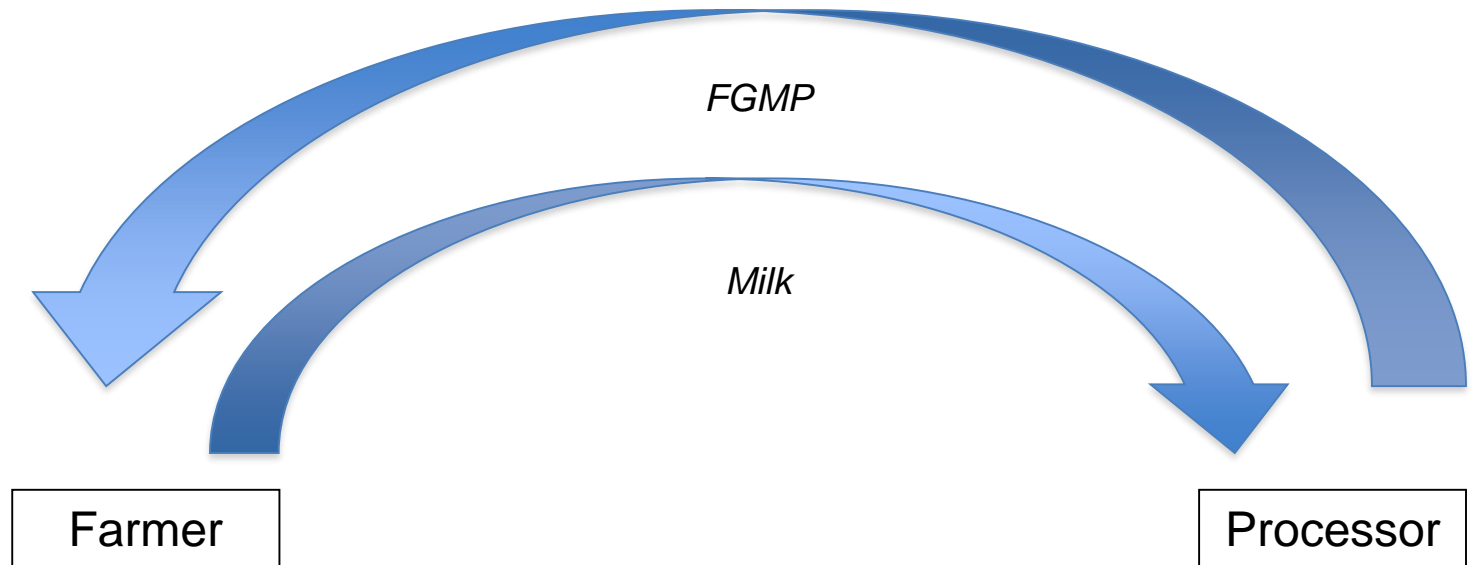
Issues / considerations

- Term – liquidity issues on longer dated milk price futures...execution strategy?
- Margin calls – cash flow implications? Daily...
- Active versus passive management...in-source versus out-source

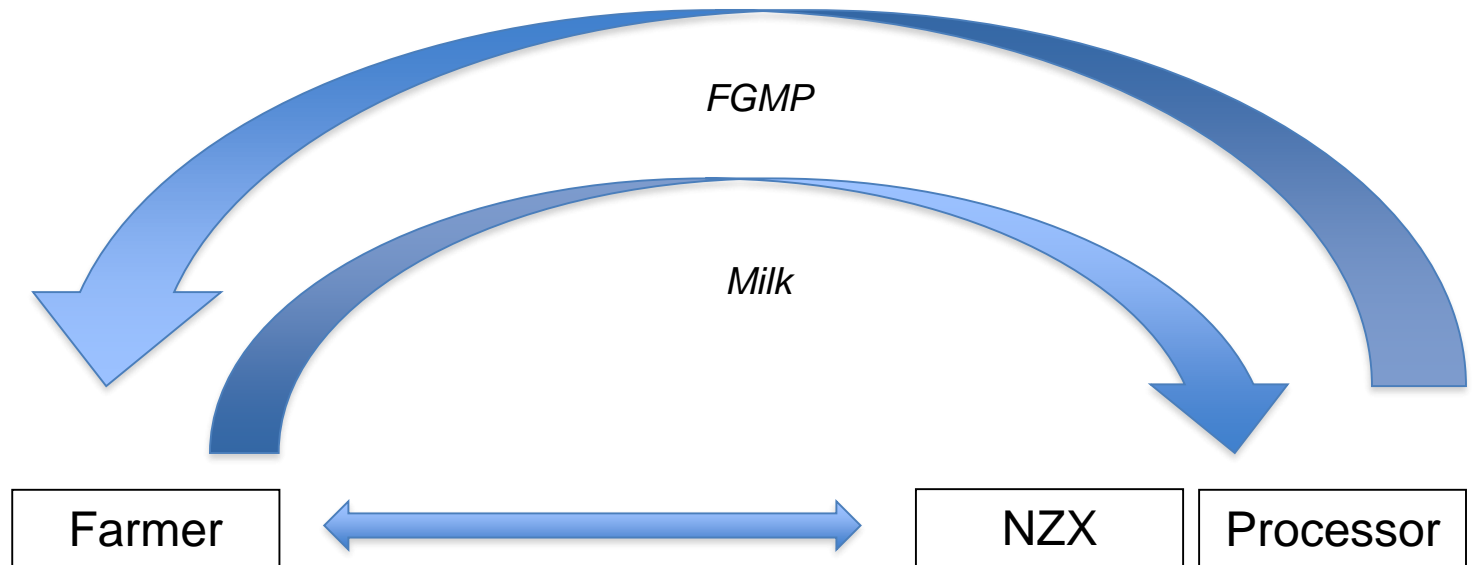
Policy

- Have you got one?
- What is it?
- Target a specific outcome?
- Target a smoothed outcome?
- WMP futures vs milk price futures?
- Active versus passive?

What are the mechanics?



What are the mechanics?



Square up between farmer and NZX

If you agree to sell your milk for \$5.50 and the FGMP is \$6.50 – you pay \$1.00

If you agree to sell your milk for \$5.50 and the FGMP is \$4.50 – you receive \$1.00

What are the mechanics?

				1-Jun-16	1-Sep-16	1-Dec-16	1-Mar-17	1-Jun-17	Total
		FGMP	Initial	\$ 4.50	\$ 5.50	\$ 6.50	\$ 7.50	\$ 8.50	
kgMS	Policy	Futures Price	Margin						
100	25%	\$ 4.50	\$ (27.00)		\$(100.00)	\$(100.00)	\$(100.00)	\$(100.00)	\$ (427.00)
-	25%	\$ 5.00							\$ -
100	50%	\$ 5.50	\$ (33.00)			\$(100.00)	\$(100.00)	\$(100.00)	\$ (333.00)
-	50%	\$ 6.00							\$ -
-	50%	\$ 6.50							\$ -
100	75%	\$ 7.00	\$ (42.00)				\$ (50.00)	\$(100.00)	\$ (192.00)
-	75%	\$ 7.50							\$ -
-	75%	\$ 8.00							\$ -
-	75%	\$ 8.50							\$ -
400									\$2,448.00
		Initial Margin Refund	\$(102.00)						\$ 102.00
		Total							\$2,550.00
		Effective FGMP							\$ 6.38

What are the mechanics?

		FGMP	Initial	1-Jun-16	1-Sep-16	1-Dec-16	1-Mar-17	1-Jun-17	Total
kgMS	Policy	Futures Price	Margin	\$ 8.50	\$ 7.50	\$ 6.50	\$ 5.50	\$ 4.50	
-	25%	\$ 4.50							\$ -
-	25%	\$ 5.00							\$ -
-	50%	\$ 5.50							\$ -
-	50%	\$ 6.00							\$ -
-	50%	\$ 6.50							\$ -
-	75%	\$ 7.00							\$ -
-	75%	\$ 7.50							\$ -
-	75%	\$ 8.00							\$ -
300	75%	\$ 8.50	\$(153.00)		\$ 300.00	\$ 300.00	\$ 300.00	\$ 300.00	\$1,047.00
400									\$2,847.00
		Initial Margin	\$(153.00)						\$ 153.00
		Total							\$3,000.00
		Effective FGMP							\$ 7.50

Summary

- Risk management policies – applied to material exposures to variables that cannot be controlled or forecast
- Commodities, by definition, cannot be controlled or forecast
- Optimise not maximise – that is, the risk versus return trade off
- Sufficient certainty against which to make some good production decisions