



**AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY**

The Irish Agriculture and Food Development Authority

**Outlook on dairy market, handling of volatility in prices, and farm economic performance on basis of case studies in Ireland**

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## Presentation Objective

- Economic performance on Irish dairy farms
- Outlook for dairy markets and prices
- Experience and handling of volatility

## Overview

- Background & Rationale
- Data and Methods
- Farm Income on Irish Dairy Farms
- Volatility in Dairy Price and Dairy farm incomes
- Outlook for Dairy Markets
- Mechanisms to deal with Price and Income volatility
- Conclusions

# Background and Rationale for this Review

- Changing times for EU (and Irish) dairy sector
- Removal of EU Milk Quota System in 2015
- Created mixed sentiment across the EU
  - Growth opportunity in some Member States (MS)
  - Threat for dairy sector in some MS
- Concern for international market volatility
  - Volatile milk prices and volatile farm production costs
  - Some concern that quota elimination could exacerbate volatility
- Voluntary production restraint 2016?
  - Article 222 of the CMO
  - Currently a hot topic in Brussels

# Measurement

- A lot of the data presented is official, market, periodical and journal related data
- But the micro farm level data presented is Teagasc National Farm Survey (NFS) data
  - FADN data provider for Ireland
  - Based on a sample of approx. 800 farms
  - Stratified random sample
  - Provides data on a range of socio demographic data in addition to economic data

# Farm Level Dairy Economics in Ireland

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## Family Farm Income per Hectare

REDP

	Size	Income
	<i>ha</i>	<i>€/ha</i>
Dairy	56	1,112
Cattle Rearing	35	329
Cattle Other	39	424
Sheep	50	323
Tillage	63	546
All	46	578

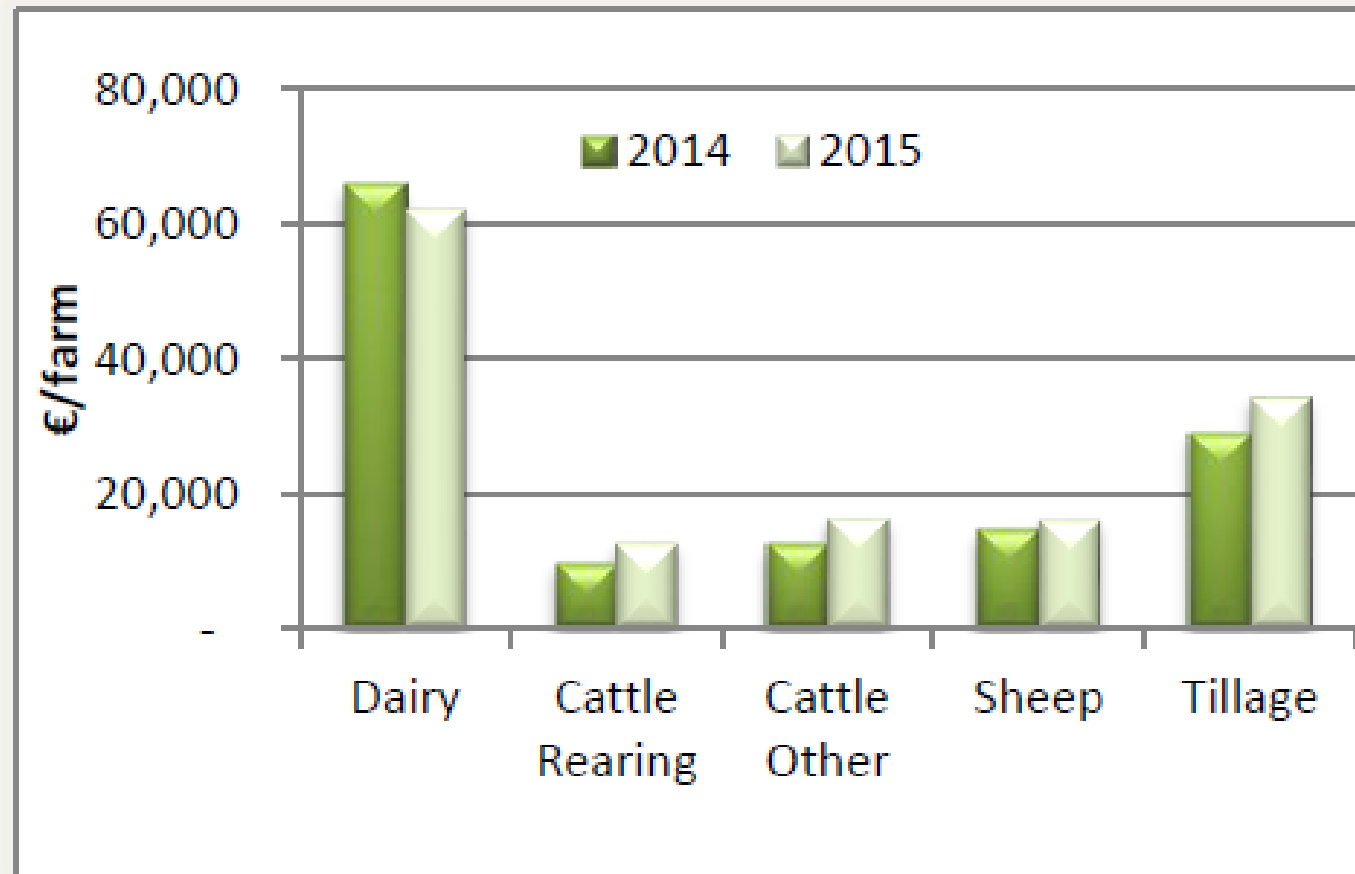
Source: Teagasc National Farm Survey 2015



# Farm Level Dairy Economics in Ireland

## Family Farm Income per farm

REDP



Source: Teagasc National Farm Survey 2015

# Farm Level Dairy Economics in Ireland

## Dairy Enterprise Indicators 2015

	2015	Change from 2014
		%
Production (litres/ha)	11,108	+6
Milk Price (€/litre)	30.3	-20
Gross output (€/ha)	3,614	-9
Direct Costs(€/ha)	1,426	-7
Gross Margin ( €/ha)	2,187	-11

Source: Teagasc National Farm Survey 2015

# Risk and Volatility on Irish Farms

What do we mean by risk?

# Farmers' Risk Perceptions

Average Ranking Position	Risk Factor	Average Ranking
1	Price Risk	1.75
2	Production Risk	2.43
3	Personal Risk	3.08
4	Institutional Risk	3.40
5	Financial Risk	4.35

*Source: Teagasc National Farm Survey 2011*

# Price Volatility Defined

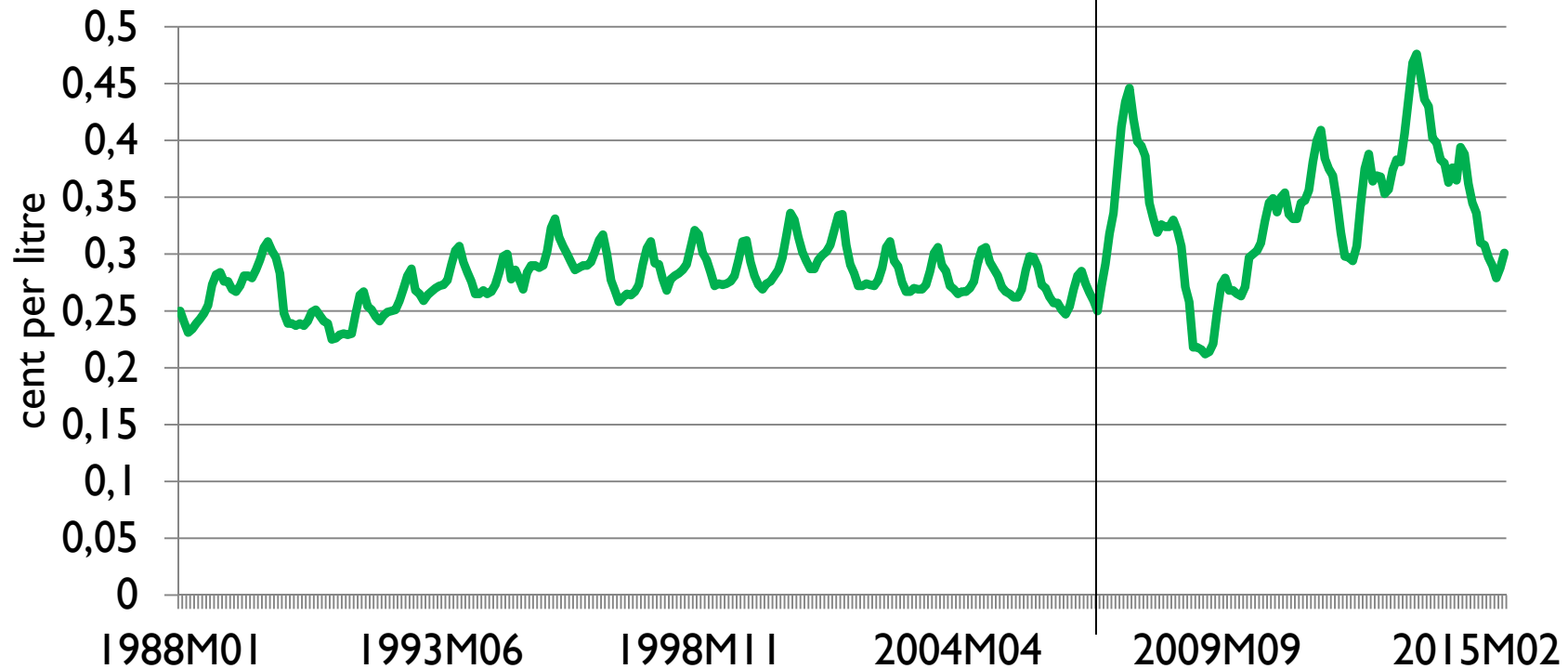
- Price volatility is one of a number of risks
- Not easily defined
  - Common to think of volatility as increased risk
  - But risk is a subjective term
- *“Price volatility is a directionless measure of the extent of the variability of a price” Gilbert and Morgan (2010)*
  - Volatility is about highs as well as lows

*Farming has always been a risky business.*

*But has it become riskier? Or more volatile?*

# Output Price Volatility

## Monthly Milk price 1988 to 2015

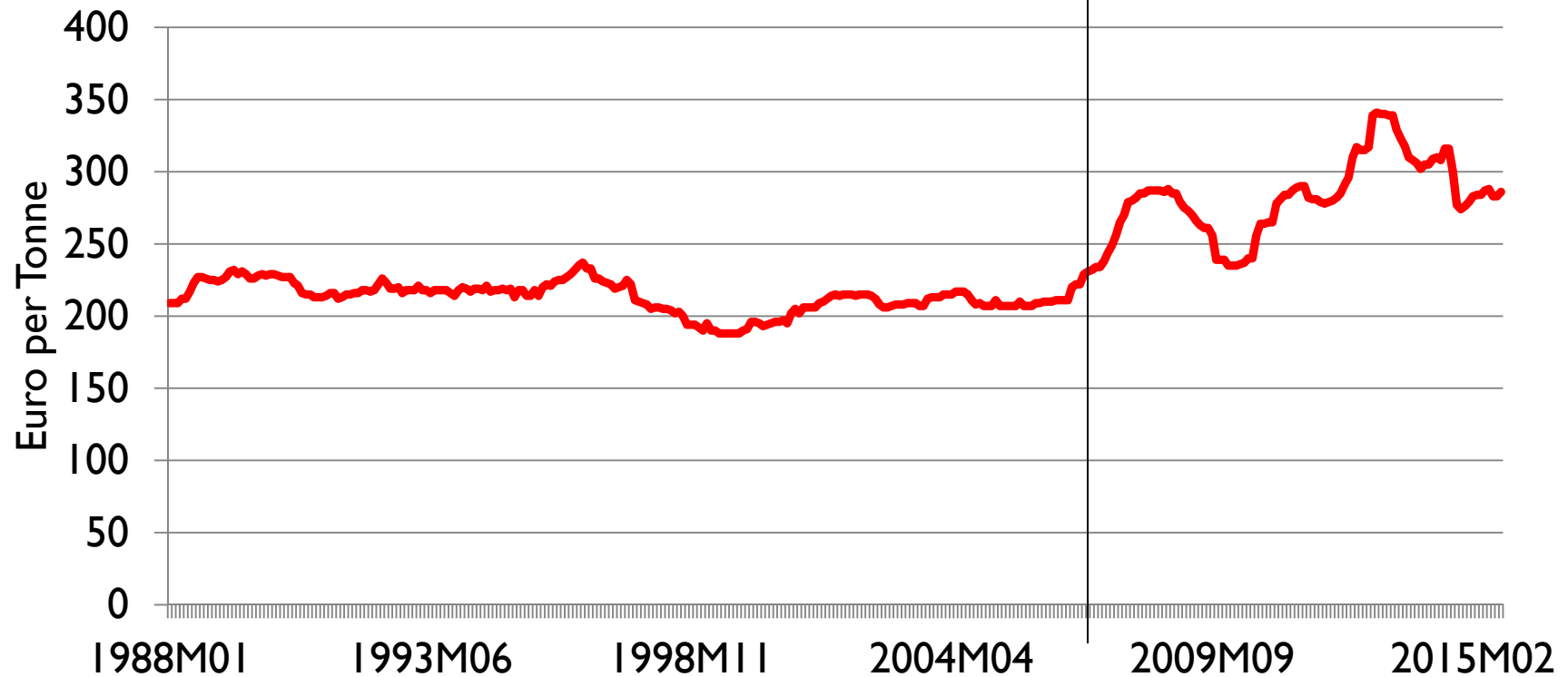


Source: CSO Ireland



# Input Price Volatility

**Dairy meal (16-18% protein)  
Monthly prices 1988 to 2015**

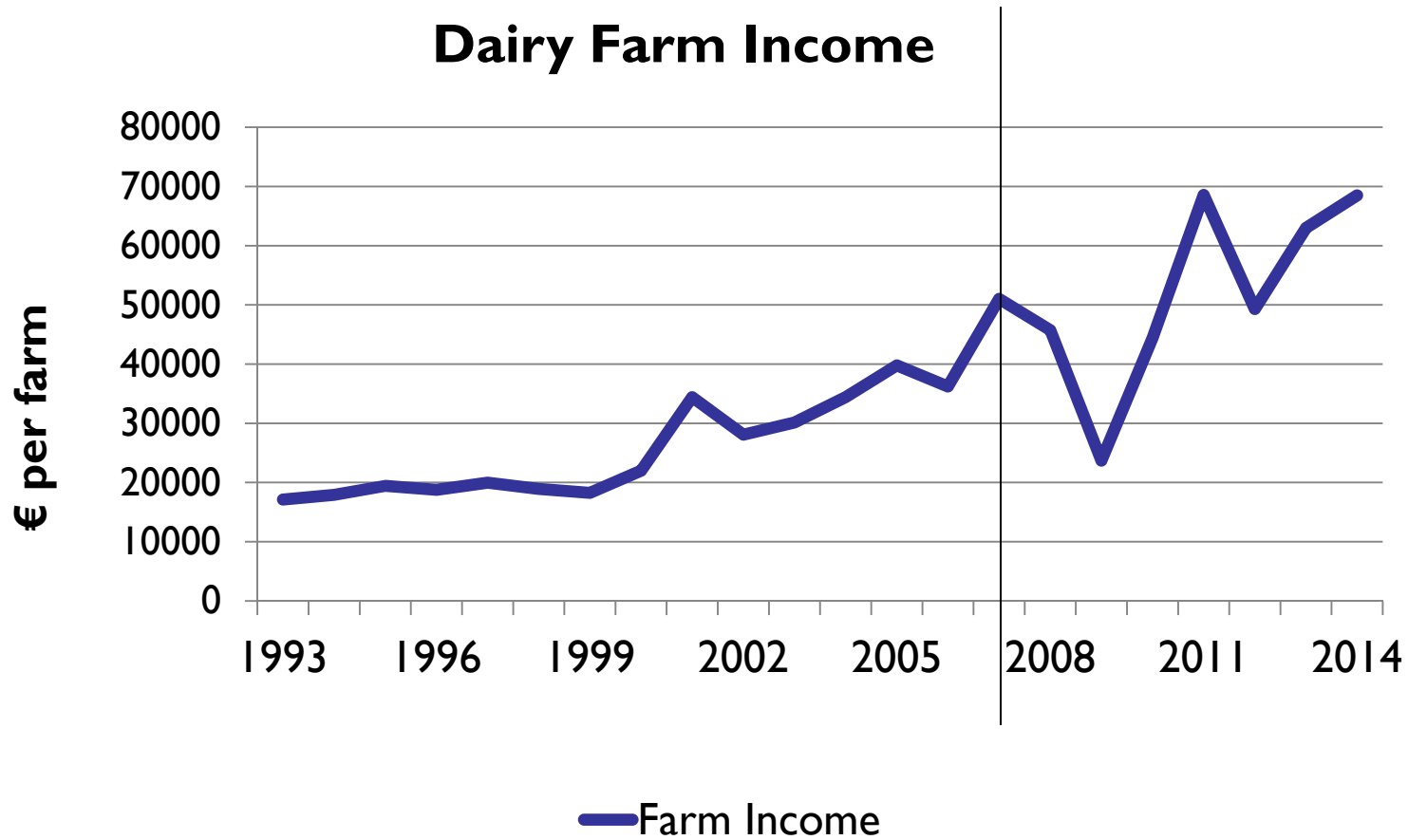


Source: CSO Ireland

# Farm Level Dairy Economics in Ireland

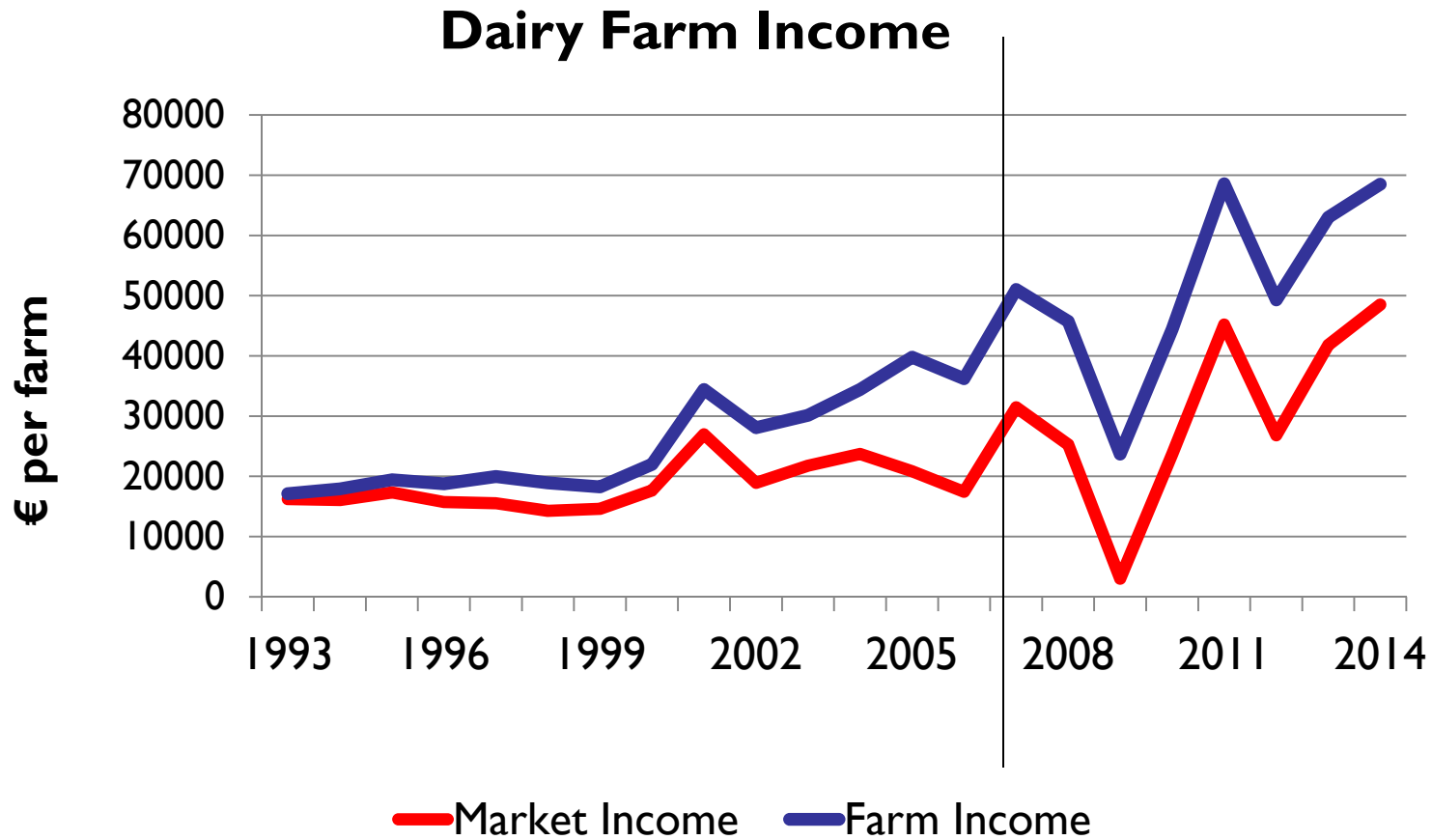
- **Income and Volatility**

# Impact on Income



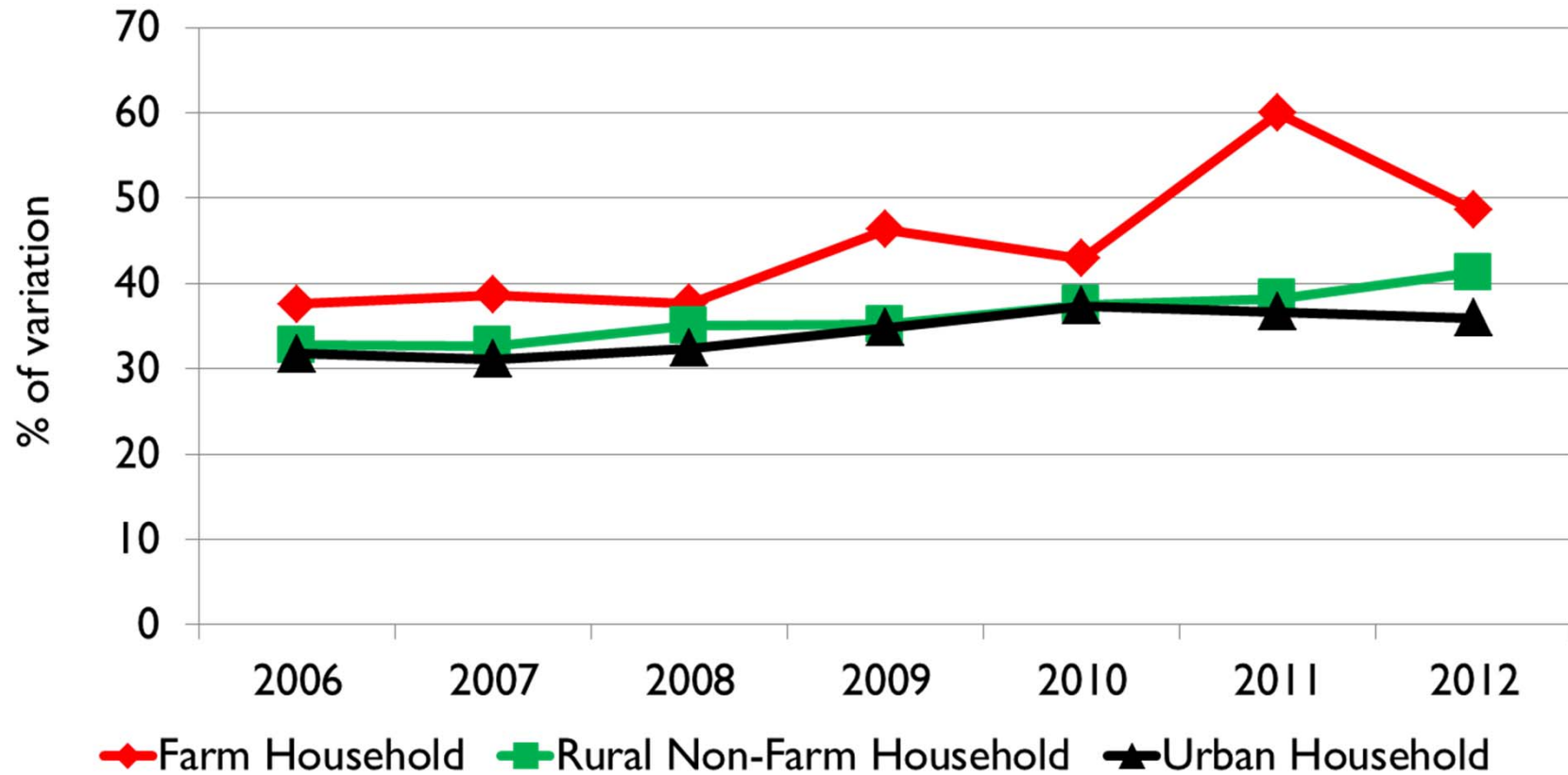
Source: CSO Ireland

# Impact on Income



Source: CSO Ireland

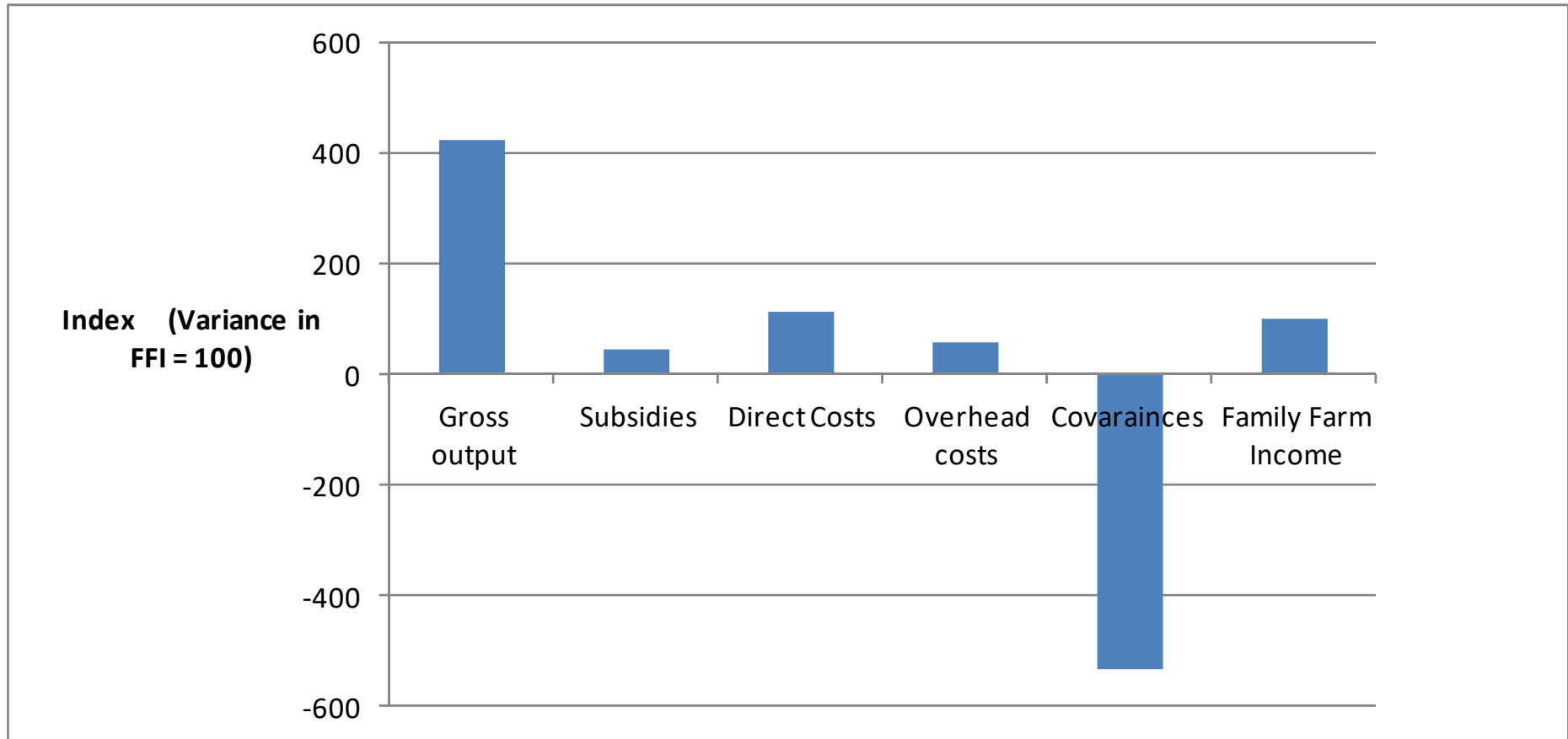
# Are farm households exposed to more risk?



*Source: Loughrey & Hennessy (2015)*

# Sources of Volatility

## Decomposition of Variance in Family Farm Income (2007 – 2012)

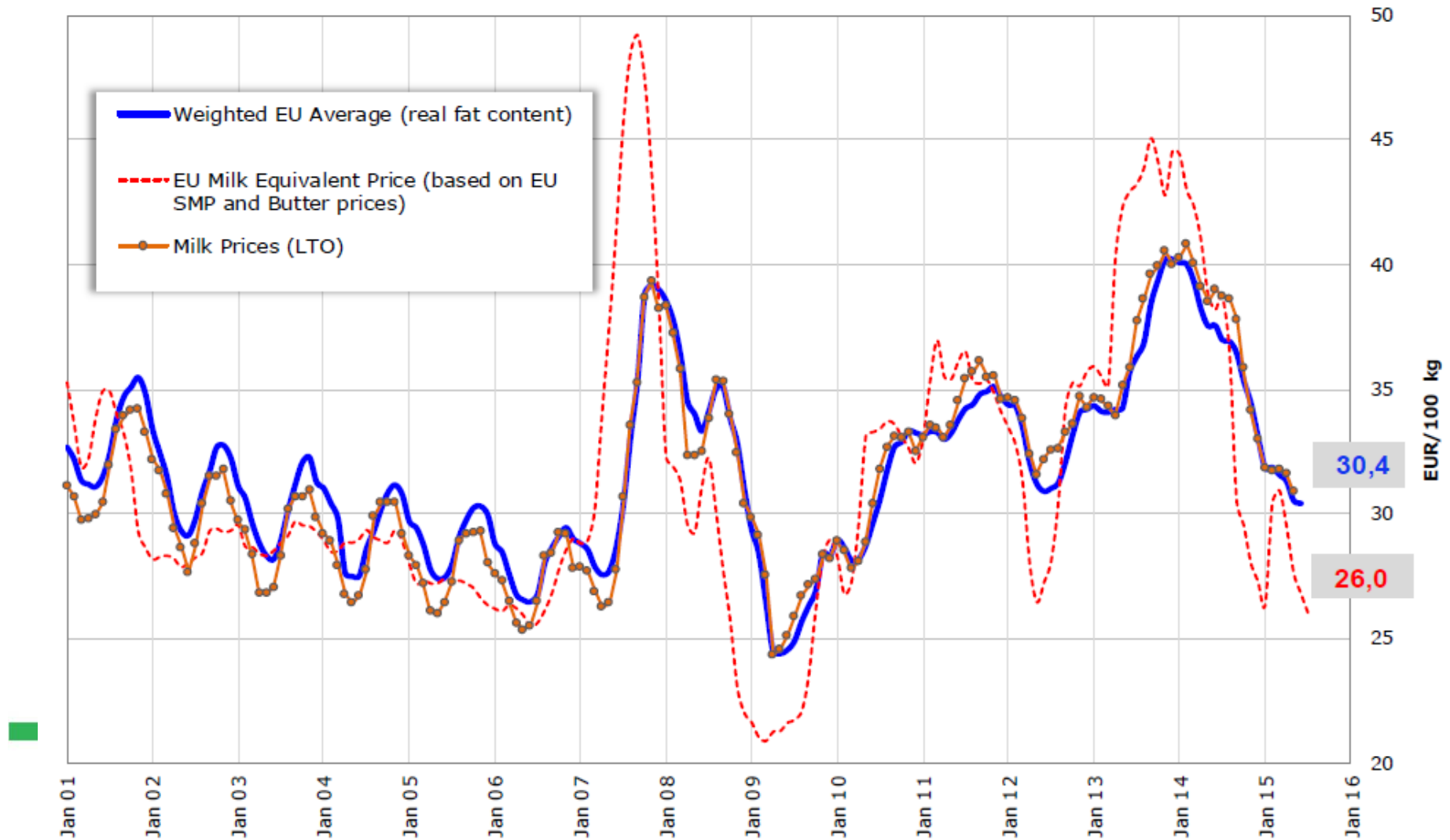


Source: Teagasc, National Farm Survey analysis

# Outlook on dairy markets

# EU Milk Price trends 2001-2016

Source: European Milk Market Observatory





# Outlook on dairy markets

- **Volatility is set to continue**
  - Based on weather, climate and policies
- **Global Dairy Trade 2016 figures for milk price are higher in Q2 than Q1**
- **Latest market prospects indicate that a recovery in international milk prices to ‘sustainable levels’ is not expected until H1 in 2017**
- **Means that coping with volatility is a very real issue at farm level, not just for Irish dairy farmers**



# Volatility, causes, implications and possible remedies

# EU Policy (reform of 2003)

## Enter Price Volatility

- **End of explicit EU price stability policy**
  - Global market volatility permeates EU market
- **Much lower “safety net” intervention prices**
  - Reduced from 2004 to 2006
  - Unchanged since 2007
- **Change of emphasis in EU Agricultural Budget**
  - Introduction of direct payments for dairy farmers
  - Much less emphasis on price stability

# Causes of Dairy Price Volatility

- **Policy change in EU**
  - Low dairy inventory levels in recent years
- **Characteristics of the demand for food**
  - Inelastic demand
- **Combined with unanticipated variation in supply**
  - Due to weather, disease, etc.,
- **Small changes in supply can cause large changes in price**
- **Biology of dairy**
  - Production responses small in short run (yield adjustment)
  - Greater in long run (herd size adjustment)

# Consequences of Price Volatility

- **Low prices cause financial problems**
  - e.g. low margins, cashflow management and debt servicing
- **High prices lead to substitution away from dairy**
  - Difficult or impossible to reverse (want stable ingredient prices)
- **Extreme volatility leads to procrastination**
  - Slows investment, innovation and R&D decisions
  - Wait and see mentality takes root
  - Culture of minimal stockholding, which itself contributes to volatility

**How do we  
manage risk?**

**Risk  
Diversification**

**Pricing models**

**Emergency relief  
Income Tax Measures**

# Market based strategies

- Forward contracts





# Forward Contracts

- **Agreement to purchase/sell specific quantity at a specific price at a certain point**
- **Risk to farmer of default can be reduced**
  - Only lock in a share of production in the contract
- **Conflict of counterparty interests**
  - Sellers want to lock in high prices /buyers want to lock in low prices
- **Education required**
  - Necessary to increase uptake of tools
  - For both processors and farmers
- **Now available for milk production in Ireland**
  - Glanbia and 5 other milk processors

# Factors Affecting Adoption of Forward **REDP** Contracts

Table 3: Results of stepwise OLS Regressions of Forward Contract Prices

	(1)	(2)	(3)
Current Price	0.442*** (0.07)		
Log Recent Price Change		0.139*** (0.02)	
Diversification	-0.077*** (0.02)	-0.070*** (0.02)	-0.066*** (0.02)
Milk Protein Indicator	-5.174*** (1.21)	-2.913** (1.23)	-5.425*** (1.86)
Number of Children 16-19	-0.631** (0.29)	-0.751** (0.31)	-0.610* (0.32)
Operators Age	0.037** (0.02)		0.031* (0.02)
Milk Fat Indicator			2.471* (1.32)
Cost Per Litre (Cent)	0.087** (0.04)		
Production (10,000 Litres)	-0.044*** (0.01)		-0.031** (0.01)
Farm Size	0.022** (0.01)		0.020** (0.01)
Coupled Income (€10,000s)	0.150* (0.08)		
Constant	31.81*** (4.35)	42.21*** (4.11)	41.26*** (4.33)
Sample Size	204	170	202
R Squared	0.285	0.263	0.124
Adjusted R Squared	0.252	0.245	0.093

# Futures Market

- **A future is a forward contract that is traded on an exchange**
  - Quality, quantity, time and location
- **A solution more suited to processors than individual farmers**
- **The contract's delivery price changes as the real commodity market price changes**
- **Market can include participants from outside sector**
  - Speculators
  - Widens pool of market participants

# Dairy Futures Markets in the EU

- Growing demand for futures based risk management solutions in dairying
- In Europe primarily driven by demand from the dairy buyer or customer side
  - Already used for their non-dairy ingredient purchases
- Reluctance on dairy seller side
  - Could rely on EU policy to stabilise market in the past
  - Unfamiliar with futures markets trading as a result
  - Still a new area for dairy, whilst well developed on the crops side

# Market based strategies

- **Insurance**

- Asymmetric information, adverse selection, moral hazard, correlated losses
- Barrier to insurance companies

- **US crop insurance**

- Government subsidised premiums
- Questionable success for Irish case

# State strategies

- Price support & intervention policies
- Income stabilisation
  - Canada compensation based on change from reference period
  - Australian bond type smoothing mechanism
- Income Tax smoothing measures
  - Income averaging over 5 years now possible
  - Tax liability can be spread from good to bad years

# State strategies

- **New CAP - Risk Management Toolkit**
  - Milk market observatory
  - Crisis reserve fund
  - Financial support for insurance and mutual funds
  - Income stabilisation mutual fund (few adopted)
  - €500 million distributed to dairy farmers 2015 from crisis reserve fund

# State Strategies

- **Voluntary Supply Constraint**
  - Collective action to limit production
  - Where producer organisations (POs) and interbranch organisations (IBOs) agree to limit production
  - Allowed by EU legislation under limited circumstances
  - Voluntary & temporary (Art. 222 of CMO Regulation)
  - Limited in order to prevent anti-competitive behaviour
- **Issue of how to regulate such agreements**
  - Potential free rider problem



# Conclusions

- **Increased volatility likely to continue**
  - Extreme weather, climate change and political unrest
  - Production costs, output volume and costs, incomes
  - Protracted 'unsustainable' milk price until H1 2017 is likely
- **How to manage risk – reduce, mitigate and cope**
- **Market based strategies**
  - Forwards eliminate both up and downside risk
  - More sophisticated tools may not be suitable for all farmers
- **Policy options available but must be WTO and national policy compatible**



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