

**Project number:** 5914  
**Funding source:** Teagasc

**Date:** June, 2015  
**Project dates:** Jan 2009-Dec2014

# Risk and Irish Agriculture



## Key external stakeholders:

Policy-makers, primary producers, agri-food businesses, local government, banking institutions

## Practical implications for stakeholders:

Recent and impending changes to the European and Irish agricultural policy environment mean that risk is becoming an ever increasing integral part of the farm management process for Irish farmers. As a result of the decoupling of direct payments, reductions in intervention price levels and liberalisation of the global agricultural trading system, Irish farmers are likely to be exposed to greater price and income volatility. Additionally, on the input side, significant volatility in the price of a number of major farm inputs, such as oil, fertiliser and concentrate feed has become common place. Hence, farm income volatility is not just an issue on the output side but also on the input side of the equation.

- The objectives of this project were to examine the literature on the issue of risk in agriculture, to define the population of farmers according to their current risk preferences and to examine the extent to which income variability has played a part in Irish farm income over the recent past and the sources of the identified income variability.
- Variation in gross output was found to be the single biggest contributor to variation in Family Farm Income using data from the Teagasc National Farm Survey for the period 2007-2012. It was also found that correlation between important variables such as revenue and cost must not be ignored because in doing so the overall variance in FFI would be overstated.
- In terms of the risk adverse nature of Irish farmers, this research has shown that the majority of farmers were willing to forward contract at less than the average expected milk price. However, only a quarter were willing to forward sell at two cent or more below this expected price. Farm diversification, demographic variables and the farmer's individual milk price history and milk price expectations were clearly associated with the presence of risk aversion.
- Further research has shown that the most cost competitive tillage farmers will demand relatively high forward contract prices in order to be incentivised into contract adoption.

## Main results:

- Gross output was found to be the single biggest direct contributor to variance in farm income over time. However, co-variation between the individual components that make up farm income is relatively more important in determining overall variance in FFI over time. Hence, the correlation between important variables such as revenue and cost must not be ignored because in doing so the overall variance in farm income would be overstated.
- The majority of dairy farmers were willing to forward contract at less than the average expected milk price but only a quarter were willing to forward sell at two cent or more below this expected price.
- The most cost competitive tillage farmers will demand relatively high forward contract prices in order to be incentivised into contract adoption.

## Opportunity / Benefit:

The micro-focused approach undertaken in this project increases our understanding of risk in Irish agriculture, the risk adverse nature or otherwise of Irish farmers, the role of risk in response to policy changes, the history of income volatility in Irish agriculture and the sources of income volatility through time.

This research provides an overview of the implications of the changing structure of agricultural policy for Irish agriculture.

## **Collaborating Institutions:**

**Teagasc project team:** Dr. Fiona Thorne, Dr. Thia Hennessy, Mr. Trevor Donnellan, Ms. Anne Kinsella, Dr. Kevin Hanrahan, Prof. Cathal O'Donoghue

**External collaborators:** University of Vermont Extension, Queens University Belfast.

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### **1. Project background:**

Recent changes to the European and Irish agricultural policy environment mean that risk is becoming an ever increasing integral part of the farm management process for Irish farmers. As a result of the decoupling of direct payments, reductions in intervention price levels and liberalisation of the global agricultural trading system, Irish farmers are likely to be exposed to greater price and income volatility. Additionally, on the input side, significant volatility in the price of a number of major farm inputs, such as oil, fertiliser and concentrate feed has become common place. Hence, farm income volatility is not just an issue on the output side but also on the input side of the equation.

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### **2. Questions addressed by the project:**

- What is the 'state of the art' in the literature relating to defining, understanding and measuring risk in agriculture?
- How to define the population of farmers in the country according to their risk preference in an attempt to gain a better understanding of the utility function of individual farmers?
- What has been the income variability of farm income over the recent past?
- What are the sources of income variability in Irish agriculture over the recent past?

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### **3. The experimental studies:**

Using data from the Teagasc National Farm Survey (NFS) main survey and Autumn survey the following analyses were carried out:

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- What are the sources of income variability in Irish agriculture over the recent past?

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### **4. Main results:**

- Teagasc National Farm Survey (NFS) data was used to identify the major sources of dairy farm income risk. This was accomplished by decomposing the variability in Family Farm Income (FFI) by major sources of risk over a 6 year period (2007 – 2012). Gross output was found to be the single biggest direct contributor to variance in FFI over time. However, co-variation between the individual components that make up FFI is relatively more important in determining overall variance in FFI over time. Indirect effects (or covariance) refer to the manner in which individual items which make up FFI, such as revenue and costs, are correlated with each other. The overall sum of the variance in the indirect contributors to variance is negative, this means that the correlation between important variables such as revenue and cost must not be ignored because in doing so the overall variance in FFI would be overstated.

- Econometric techniques were used to identify farmers who indicate risk aversion in the use of forward contracting as a form of risk management and employed econometric techniques to further understand these preferences, using data from the Teagasc, National Farm Survey (NFS). It was found that the majority of

farmers were willing to forward contract at less than the average expected milk price but only a quarter were willing to forward sell at two cent or more below this expected price. This suggests that the margins between the expected market price and the forward contract price matter to farmers and this will be an important factor in determining future adoption rates for the forward contracting tool. Furthermore, farm diversification, demographic variables and the farmer's individual milk price history and milk price expectations were clearly associated with the presence of risk aversion.

- A stochastic modelling framework of spring barley production and projected uptake of forward contracts (as indicated from survey work) suggests that the most cost competitive tillage farmers will demand relatively high forward contract prices in order to be incentivised into contract adoption. This tendency will, of course, be partly dependent on the degree of risk aversion. The reluctance of highly cost competitive farmers is likely to be compounded in circumstances of high net wealth.

## 5. Opportunity/Benefit:

It is important that all stakeholders have the best information available to them in terms of future planning requirements for the sector. This project clearly quantifies the risk adverse nature of Irish farming.

## 6. Dissemination:

### Main publications:

Loughrey, J., Thorne, F., Kinsella, A., Hennessy, T., McDonnell, J., O'Donoghue, C and Vollenweider, X. (2014) The market risk perceptions and management of Irish dairy farmers, Agricultural Economics Society 88th Annual Conference, April 9-11, 2014, AgroParisTech, Paris, France <http://purl.umn.edu/169760>

Loughrey, J., Thorne, F., and Hennessy, T., (2015) The Direct Impact of Risk Management Tools on Farm Income: The Case of Ireland's Spring Barley Producers Contributed Paper prepared for presentation at the 89th Annual Conference of the Agricultural Economics Society, University of Warwick, United Kingdom 13 - 15 April 2015

### Popular publications:

Kauppila, D., Kinsella, A., Loughrey, J., O'Donoghue, C., McDonnell, J. and Thorne, F. (2013) Identifying and Managing Risks, National Dairy Conference 2013

Thorne, F., Hennessy, T., Hanrahan, K., Donnellan, T., O'Connor, D. and Keane, M. (2011) Volatility in agricultural markets: evidence, causes and possible solutions, TResearch, Vo. 6., No.1 Spring 2011

Breen, J., Clancy, D., and Thorne, F. (2009) The Situation and Outlook for Crops, In: Teagasc Situation and Outlook Conference, Portlaoise.

Thorne, F. (2010) The Situation and Outlook for Crops, In: Teagasc Situation and Outlook Conference,

Thorne, F. (2011) The Situation and Outlook for Crops, In: Teagasc Situation and Outlook Conference

Thorne, F. (2013) The Situation and Outlook for Crops, In: Teagasc Situation and Outlook Conference

Thorne, F. (2014) The Situation and Outlook for Crops, In: Teagasc Situation and Outlook Conference

## 7. Compiled by: Fiona Thorne