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Selling the farm: understanding irrigators' intentions to sell the farm in the Murray-Darling Basin

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Introduction

- Agriculture is an inherently uncertain enterprise
- Water scarcity and drought has always been a regular occurrence in Australia
- Farmers exit as a consequence of drought and associated water restrictions
- The national average rate of exit from farming was 6.2% in 2006 and 5.7% in 2011 (Barr, 2014). The average rate of exit in the MDB was almost twice as the national average.
- Farmers' intentions reasonably match their actual behaviour in situations of average to full water allocations (Wheeler et al. 2013)

Research Questions

What drives irrigators' intentions to sell the farm?

What role does rainfall and water related variables (i.e. water ownership, water availability and water price) play in irrigators' intentions to sell?

Literature Overview: Exit influences

	Exit Influence	Strength of result
Farm subsidies and support policies	-	***
Commodity payments	+	**
Exit packages	+	*
Conservation reserve programmes	-	*
Urbanisation	+	**
Market Prices	-	*
Market Price Variance	+	*
Sunk costs (Farm type)	-	**
Size - land area or sales value	-	***
Diversification	-	*
Farmer age	+ & -	***
Farm facility age	+	***
Successor/no. children	-	**
Off-farm income	+ & -	**
Employment/regional GDP	+	*
Education	+	*
Debt	+	**
Location	+	**
Productivity	-	**
Ownership	+ & -	*
Family farms	-	*

Empirical approach

- The following equation is estimated for intentions to sell the farm:

$$\text{Intention to Sell}_i^* = X_i\beta + \varepsilon_i$$

where: Individual irrigators are indexed by i .

Intention to Sell_i^* is a latent variable ranging from $-\infty$ to ∞ .

The observed binary variable for plan to sell is 1 if $\text{Sell}_i^* > 0$ and 0 if $\text{Sell}_i^* \leq 0$.

X_i is a vector of independent variables including rainfall and water related variables

- Firstly, an overall regression model is estimated by the probit model for all years (standard errors are allowed for intragroup correlation, i.e. the same irrigator over a number of years).
- Second, separate regressions are estimated for each year, allowing for varying effects of independent variables on plan to sell across years.

Data description

- Seven rounds of the ABARES survey of irrigation farms (2006-07 to 2012-13)
- Study region: southern Murray Darling Basin (regions of Goulburn, Murrumbidgee and Murray)
- 2,840 observations overall covering three industries: broadacre, dairy and horticulture.
- Future plan question: Are you planning to sell your farm (including retire) in the next three years? Eg:




	<i>NSW Murray</i>	<i>Murrumbidgee</i>	<i>Victoria Murray</i>	<i>Goulburn</i>	<i>South Australian Murray</i>
Plan to sell (%)	13	8	11	10	14

- Combined with Rainfall (Australian Water Availability Project); and regional water prices (NWC's water trading database)

Key Water Results on Dependent Variable of Intentions to Sell the Farm

	2006-07 (Dry)	2007-08 (Dry)	2008-09 (Dry)	2009-10 (Dry)	2010-11 (Wet)	2011-12 (Wet)	2012-13 (Semi-dry)
High security water entitlement ownership (ML)		- ***		- *			
General/low security water entitlement ownership (ML)			- ***				- **
Water allocation price (\$/ML)	- *	+ *	+ ***				
Water entitlement price (\$/ML)	+ *	+ **	+ *				
Winter rainfall	- *	- *	- **				- *

Main conclusions

- Water related variables do appear to influence irrigators' intention to sell their farms in the next three years. In particular:
- Higher water entitlement ownership
 - the plan to sell in dry or semi-dry seasons; but not in wet seasons; 
- Higher water prices (allocation and entitlement) 
 - the plan to sell in dry seasons;
- Lower winter rainfall 
 - the plan to sell in dry seasons;
- It is important for any policy that aims to encourage farm exit or provide income support to family farms to stay farming to consider the effects of water availability, ownership and prices on irrigators' intention to sell their farms.

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