



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Which Drives More in Business Performance: Differentiating the
Effects of Risk-Aversion and Overconfidence about Risk on
Business Performance among Agricultural Enterprises

Presenter: Zhenhua Sun, MSc Student

Co-Author: Ying (Jessica) Cao Department of Food, Agricultural
and Resource Economics, University of Guelph and Division of
Health Services Policy and Practice, State University of New York
at Buffalo

Poster prepared for the
7th Annual Canadian Agri-Food Policy Conference,
January 11-13, 2017, Ottawa, ON
Sponsored by the Canadian Agricultural Economics Society

Introduction

- Overconfident** producers would produce more aggressively (Hvide, 2002; Just & Cao, 2016) , and are more likely to have better market outcomes than **risk-averse yet rational** producers.
- The separate effects of risk-aversion and overconfidence on business performance measures have not been empirically tested.

Theoretical Model

From Profit Maximization $R_A \psi^2 = \frac{\mu_g - C'(x)}{\sigma^2 x}$, where
the Arrow-Pratt Risk Aversion Coefficient $R_A = -\frac{u''}{u'} > 0$;
 ψ is the degree of overconfidence, measured as the ratio between perceived variance and the real ones;
 μ_g is the true average output price;
 σ^2 is the true variance of the output price;
 $C'(x)$ is the marginal cost, x is quantity.

Key Definitions

- Risk Aversion** (R_A)
- The behavior of humans to be reluctant to accept a bargain with an uncertain payoff rather than another bargain with a more certain, but possibly lower, expected payoff.
- Overconfidence** (ψ)
- Miscalibration Effect: a person tends to believe certain outcomes to be more favorable on average than the outcomes truly are (More and Daylian, 2007).

Data

- Production data**
- Farm income & production information for beef-cattle farms from Ontario Farm Income Database (OFID) between 2003 and 2013 (12,837 Farm-Year observations).
- Price data** (Obtained from Statistics Canada)
- Yearly average beef-cattle prices and standard deviations.

Method

- Focus only risk-averse farm-year cases ($R_A \psi^2 > 0$) and those within 10% to 90% percentile to avoid extreme values ($N = 8,299$).
- Assume 20 overconfidence types (ψ) for each farm-year case and generate contingent values of risk aversion (R_A). Overconfidence levels range from 0.8 and 1.2 where lower values indicate more overconfident ($N = 8,299 \times 20$).
- Classify farm-year cases by degrees of overconfidence and risk aversion, yielding 20×20 types of producers.
- Calculate the average business performance for each of the 400 producer types and explore the relationship with the two behavioral traits (i.e. R_A and ψ)

Results

- For a given level of overconfidence (ψ), as Risk-aversion (R_A) increases, mean gross margin increases at the beginning and then decreases.
- For those with higher risk aversion (top 25 percentile), overconfident farmers (with lower ψ) tends to have larger mean gross margins.

- The linear functional forms verify the expected signs of risk aversion and overconfidence. Both R_A and ψ are negatively related to mean gross margins.
- The quadratic functional form (3) captures the trend that moderate overconfidence yields competitive advantages.

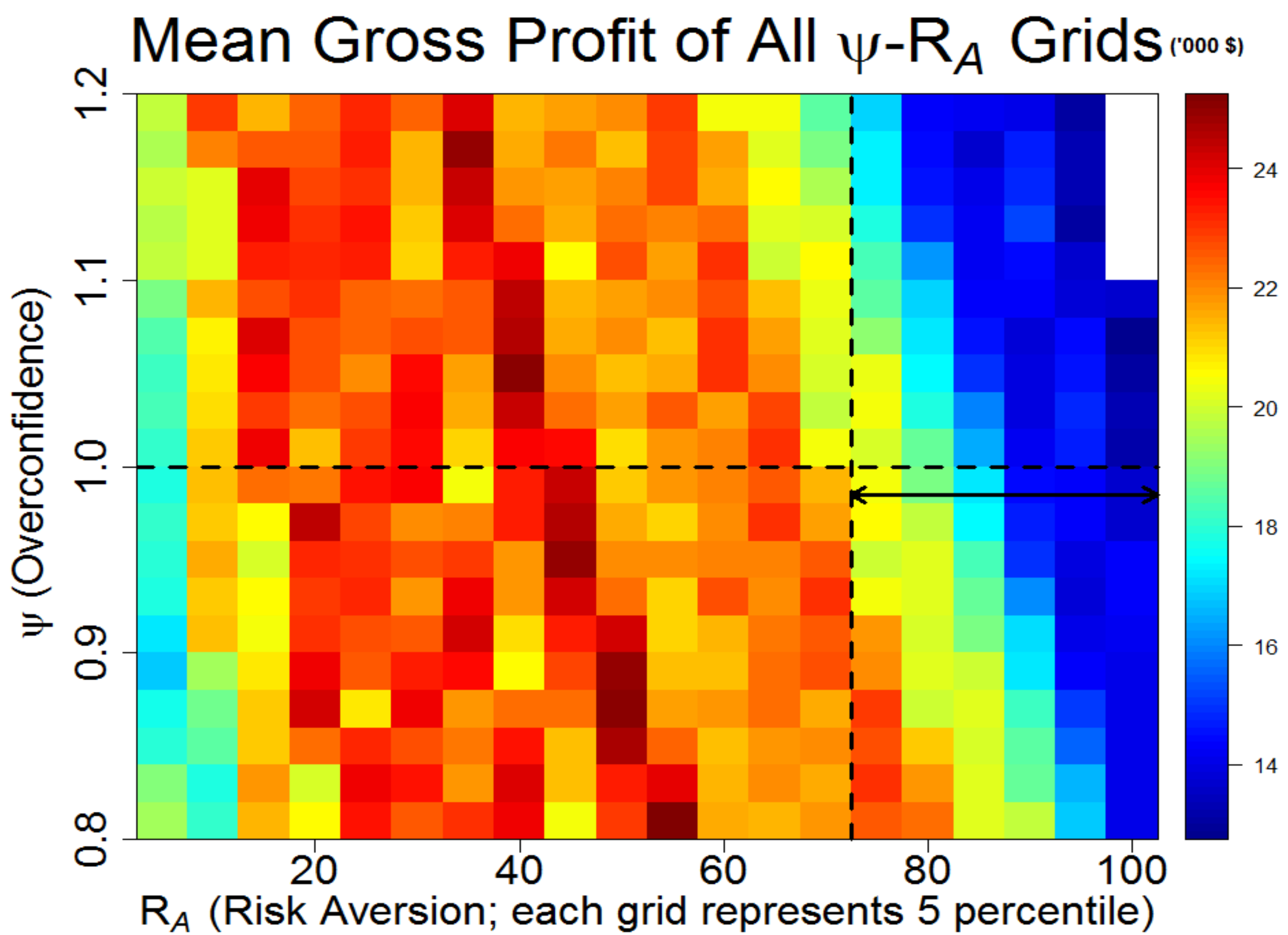


Table 1: Gross Profit / Gross Mean Profit Regressed on $R_A \psi^2$					
Variables	Gross Profit (1)	Gross Profit (2)	Mean Gross Profit (3)	Mean Gross Profit (4)	Mean Gross Profit (6)
$R_A \psi^2$	-604.53*** (57.21)	-604.53*** (12.79)	-438.25*** (16.07)		
R_A				-413.73*** (16.95)	-413.79*** (16.98)
ψ^2				-2.23*** (0.43)	-3.06 (8.43)
ψ					1.66 (16.86)
Constant	23.0945*** (0.36)	23.09*** (0.08)	22.67*** (0.13)	24.80*** (0.46)	23.99** (8.34)
N	8,496	169,920	400	400	400
Multiple R^2	0.013	0.013	0.654	0.608	0.608
Adjusted R^2	0.013	0.013	0.654	0.606	0.605

Note:
(a) Dependent variables are in thousands of Canadian Dollars;
(b) In regression (1) and (2), R_A is the exact value; in regression (3) to (6), R_A is the upper bound of the percentile rank;
(c) ***: p = 0.001; **: p = 0.01.

Policy Implications & Future Research

- Both Overconfidence and Risk-Aversion affect producers' business performance, yet differently.**
- Moderate overconfidence makes producers better off.** Paternalistic government interventions that aim to offset the economic effects of subjective biases, such as overconfidence, may be counterproductive. Government should allow farmers to freely decide whether or not to enroll in Business Risk Management programs, such as AgriStability.
- It may be optimal to be overconfident even though this may result in taking excessive risks.** Government should take initiatives in providing as accurate market information as possible to farmers. This will make it less likely for overconfident farmers to predict their income variance based on wrong information.
- Next step: Explore the potential links between the income effects of overconfidence and farmers' AgriStability enrolment decision.