

# Is there a weakest link in innovation adoption? An application of the innovation value chain concept to Ontario farm businesses\*

Eric Micheels, University of Saskatchewan; Andreas Boecker, University of Guelph

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## What?

do we want to accomplish

...determine whether and how **innovation capacity**, as measured by the **Innovation Value Chain (IVC) concept**<sup>1,2</sup>, is linked to **innovation adoption**.

In fact, a significant focus of Growing Forward 2 (GF2) is focused on innovation. (...) Although the definition of 'innovation' is clearly articulated on the GF2 Program Guide for Implementation to producers, background research would be helpful to gain a better understanding of the driving forces behind innovation. *Henry Denotter, President Ontario Soil and Crop Improvement Association, January 2014<sup>3</sup>*

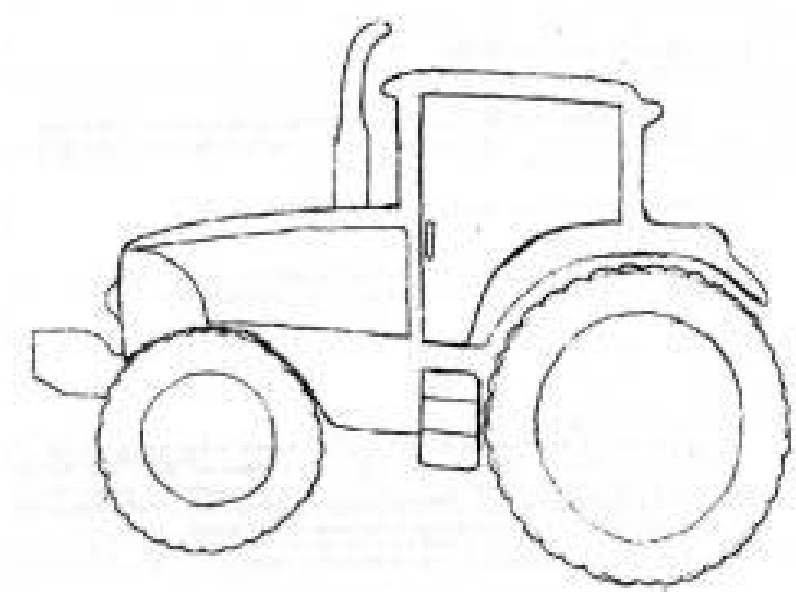
## Why?

and to whom would that be relevant

However, recent research also suggests there is strong potential to increase productivity by enhancing uptake of existing innovation. The productivity gains from innovation adoption are likely to depend on the capacity of farmers to effectively select, adapt and integrate innovations into existing farming systems. *Katarina Nossal Australian Bureau of Agricultural and Resource Economics and Sciences, February 2012<sup>4</sup>*

## How?

to put this all in a model



### Farmer and farm characteristics

- e.g. Farm size
- Education
- # of employees

### 3 Links of Innovation VC

- Idea generation
- Idea testing
- Idea implementation



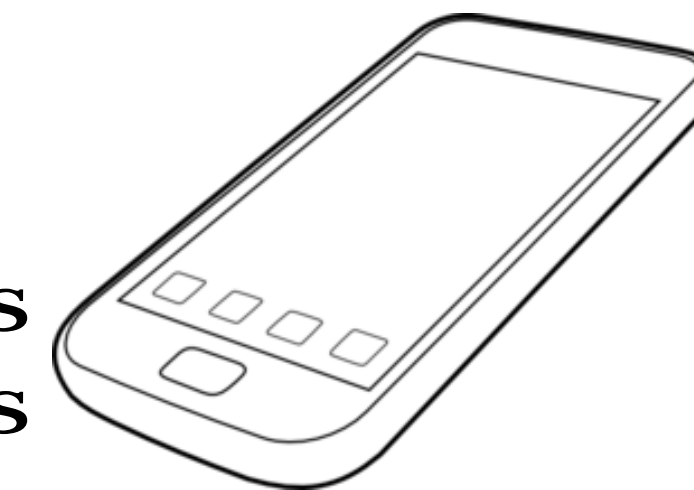
### Farm performance

Self-reported satisfaction with 8 performance indicators



### Innovation adoption

- # small extent innovations
- # large extent innovations



### Data collection (April 2013)

- online survey through IPSOS
- n = 405 Ontario farm operations
- reflects diversity of Ontario farms in production & marketing

### Key innovation-related variables

- Innovation value chain (IVC) score for each stage: lowest score = weakest link
- Innovation score: based on small & large extent innovations in 34 categories; large has weight of 4; small has weight of 1.

### Concept-based hypothesis:

**Weakest link of innovation value chain (link with lowest score) determines extent of innovation adoption.**

### Competing hypothesis:

**Average strength of innovation value chain determines extent of innovation adoption.**

## Preliminary results: Descriptive and correlation analysis

| Size: Gross sales  | Weakest Link/Innovation Score  | Average Strength/Innovation Score |
|--|--------------------------------|-----------------------------------|
| <b>Average IVC scores and # of innovations</b><br><b>Less than \$100,000 (n=159)</b><br>Weakest link of IVC 2.8<br>Average strength of IVC 3.8<br>Large extent innovations 1.5<br>Small extent innovations 7.3 | <br>$r = 0.039$<br>$p = 0.630$ | <br>$r = 0.026$<br>$p = 0.743$    |
| <b>\$100,000-\$499,999 (n=140)</b><br>Weakest link of IVC 3.0<br>Average strength of IVC 3.9<br>Large extent innovations 1.9<br>Small extent innovations 8.4   | <br>$r = 0.051$<br>$p = 0.547$ | <br>$r = 0.249$<br>$p = 0.003$    |
| <b>\$500,000-\$999,999 (n=52)</b><br>Weakest link of IVC 3.2<br>Average strength of IVC 4.1<br>Large extent innovations 2.3<br>Small extent innovations 9.9  | <br>$r = 0.157$<br>$p = 0.267$ | <br>$r = 0.224$<br>$p = 0.111$    |
| <b>\$1,000,000 and above (n=54)</b><br>Weakest link of IVC 3.2<br>Average strength of IVC 4.1<br>Large extent innovations 3.0<br>Small extent innovations 10.3   | <br>$r = 0.492$<br>$p = 0.000$ | <br>$r = 0.537$<br>$p = 0.000$    |

### Preliminary findings summary

- Little variation in IVC scores across farm sizes.
- Number of innovations increases slightly with farm size.
- Correlation between weakest IVC link and innovation adoption significant only among largest producers; not stronger than average strength of IVC.

### Outlook on work ahead

- Test validity and reliability of IVC scale (no attempt yet documented in literature)
- Develop competing models to examine link between innovation capacity (IVC) and adoption of innovations

### References:

<sup>1</sup>Doran, J., and E. O'Leary (2011): External Interaction, Innovation and Productivity: An Application of the Innovation Value Chain to Ireland. *Spatial Economic Analysis*, 6(2): 199-222.; <sup>2</sup>Hansen, M.T., and J. Birkinshaw (2007): The innovation value chain. *Harvard Business Review*, June 2007. <sup>3</sup>Written communication to Andreas Boecker in letter of support for research proposal to OMAFRA-U of G Research Partnership to investigate farm-level innovation capacity. <sup>4</sup>Nossal, K. (2012): Innovative capacity and productivity: an empirical analysis of Australian grain growers. Paper presented at the 56<sup>th</sup> Australian Agricultural and Resources Economics Society (AARES) Conference, February 7-10, 2012, Fremantle, Western Australia.