

18. Machinery Costs in Kansas

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Gregg Ibendahl joined the faculty in fall 2012 as an associate professor of agricultural economics with a major appointment in extension. Prior to joining the K-State faculty, he served as an associate extension professor at Mississippi State University. His specialty areas are farm management and agricultural finance. Ibendahl earned his Ph.D. from the University of Illinois in agricultural economics. He also has an MBA from Northern Illinois University. His undergraduate degree is from Southern Illinois University, where he majored in agricultural mechanization and earned a minor in computer science.

Abstract/Summary

Machinery costs are a big expense for most farms. Crop production will require, at a minimum, a trip to plant the crop and a trip to harvest the crop. Thus many farms will own a tractor, planter, and combine plus other equipment. Farmers who decide to own most of their equipment have to decide how often to replace their equipment, and how much equipment they will own relative to the size of their operation. Farmers who trade equipment more often will have higher depreciation expenses but should have lower machinery operating expenses. Farmers who have less equipment relative to their farm size, may have lower operating costs but also run the risk of not finishing planting and harvesting in a timely fashion.

This presentation will analyze the highest income farms in the state to determine their machinery investment per acre and to examine their machinery operating costs. This presentation should help show if farmers can increase their profitability by better managing their use of farm machinery.

Machinery Costs in Kansas

Gregg Ibendahl
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Most farmers need equipment

- Impossible to produce a crop without equipment
 - Some latitude for equipment choice
 - No-till vs other tillage
 - Who owns the equipment
 - Farmer owned vs custom operator vs leasing
 - For farmer owned equipment
 - Decisions about when to replace
 - Decisions about the equipment level needed

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Question to address

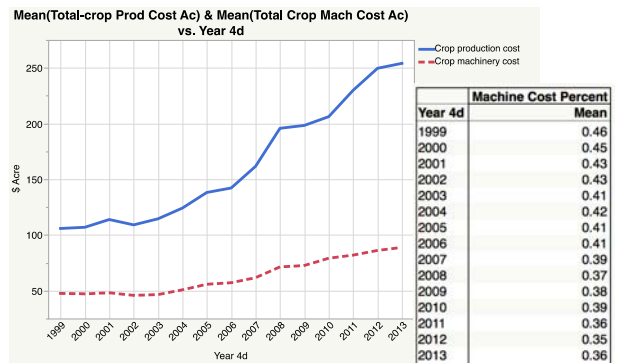
- to examine how net farm income per acre is affected by
 - depreciation,
 - machinery repairs,
 - and the use of custom operators
 in order to determine the best strategy for producing a crop.

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Total Crop Cost vs Machinery Cost



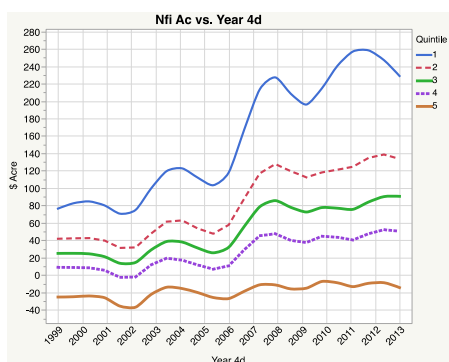
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Some background Net Farm Income per Acre by Quintile

Increasing profitability from 2002 through 2012
 Most profitable farms earning high profits



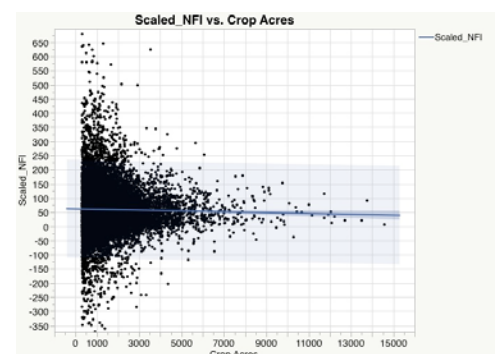
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Some background Net Farm Income by Farm Size

Are bigger farms more profitable?



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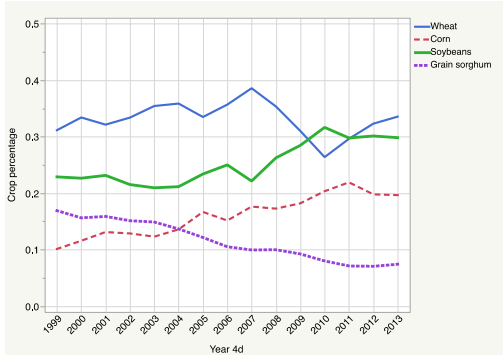
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Some background

The Average Crop Mix

Has the crop mix changed over time?



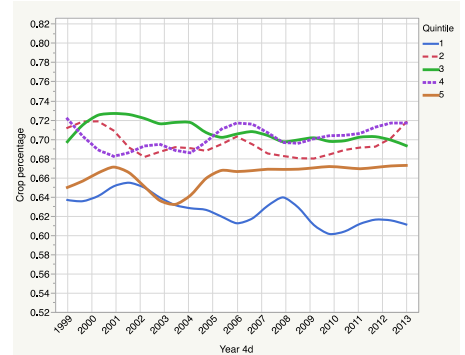
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Some background

Percent of Crop Acres Rented by Quintile

Do more profitable farms rent either less or more land?



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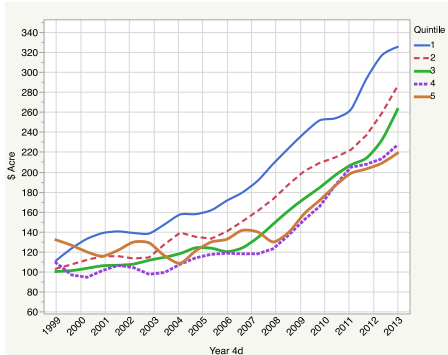
Machinery Investment

Average Equipment Assets per Acre by Quintile

Most profitable farms have the most assets

Jump in equipment assets

1. More equipment
2. Newer equipment
3. Higher priced equipment



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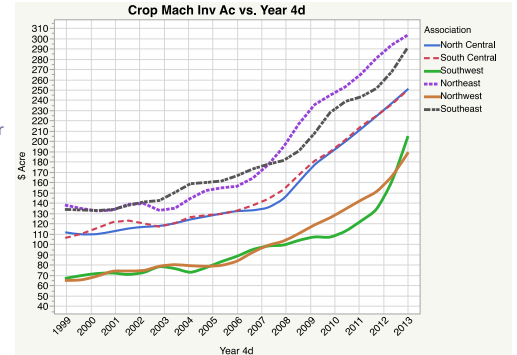
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Machinery Investment

Average Machinery Investment per Acre by Region

Exactly as expected.

More machinery per acre moving west to east



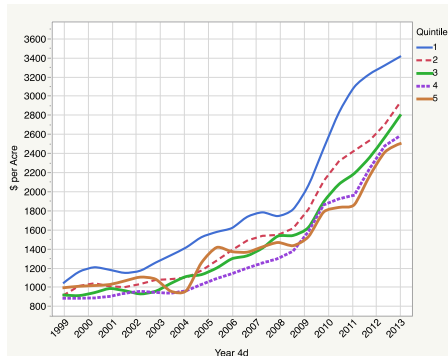
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Non-Machinery Investment

Average Land Assets per Acre by Quintile

The most profitable farms have the best land



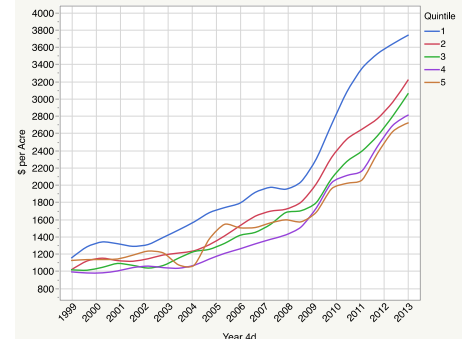
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Total Capital Managed

Average Assets (plus rented land value) per Acre by Quintile

The most profitable farms have the most assets per acre – including the value of rented land



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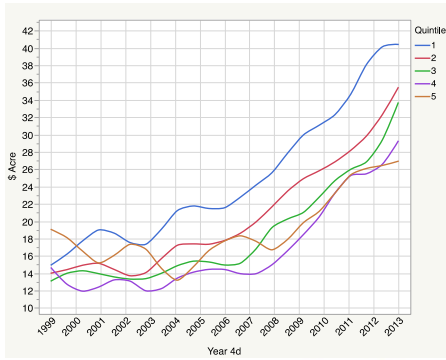
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Machinery Depreciation

Machinery Depreciation per Acre by Quintile

Mirrors previous graph as expected

Not using tax depreciation



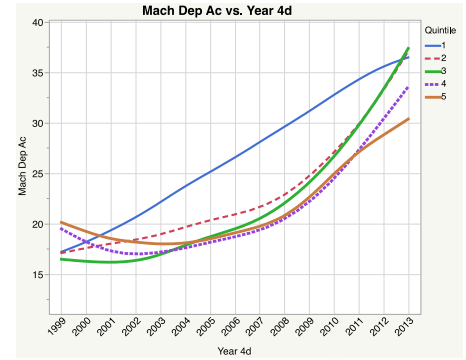
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Machinery Depreciation – Southeast

Machinery Depreciation per Acre by Quintile

Very similar to entire state



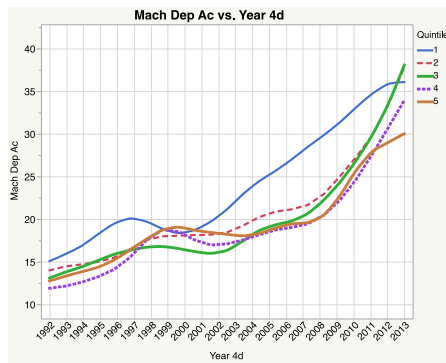
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Machinery Depreciation – Southeast

Machinery Depreciation per Acre by Quintile

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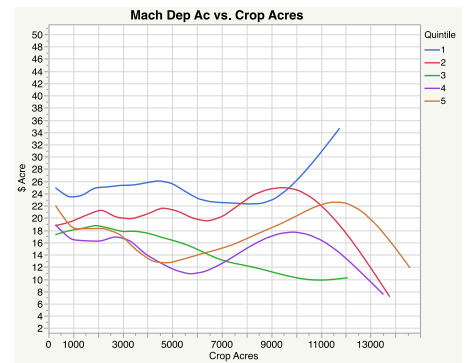
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Machinery Depreciation

Machinery Depreciation by Farm Size by Quintile

Examining how depreciation is affected by farm size

The smaller number of large farms makes this graph suspect



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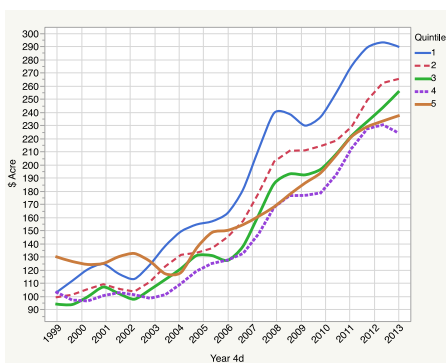
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Crop Production Costs

Total Crop Production Costs per Acre by Quintile

The most profitable farms also have the highest production costs

Similar to machinery depreciation



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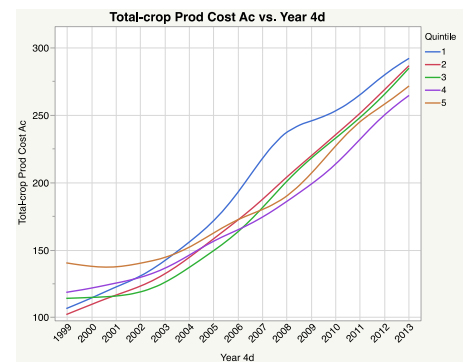
Crop Production Costs - Southeast

Total Crop Production Costs per Acre by Quintile

The most profitable farms also have the highest production costs

Similar to machinery depreciation

Not quite as obvious in region



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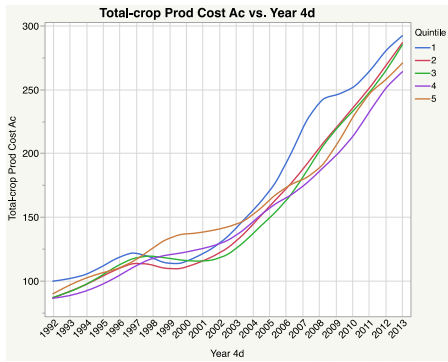
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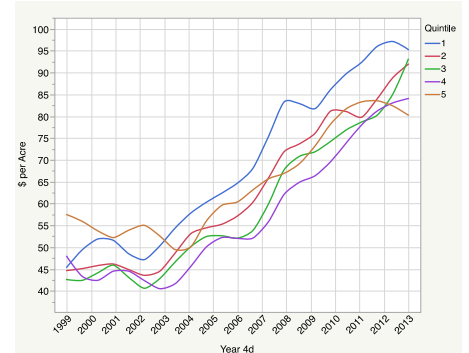
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Crop Production Costs

Total Machinery Costs per Acre by Quintile

The most profitable farms also have the highest total machinery costs



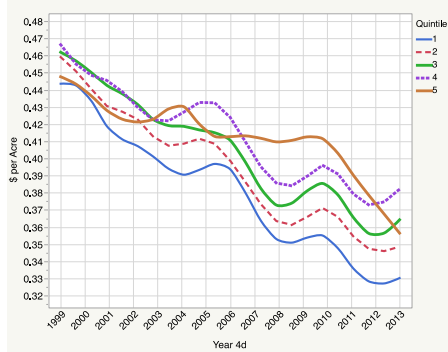
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Crop Production Costs

Machinery Costs as a Percent of Total Crop Costs by Quintile

Even though the most profitable farms have the highest depreciation and machinery costs, as a percent of total crop costs, it's the lowest

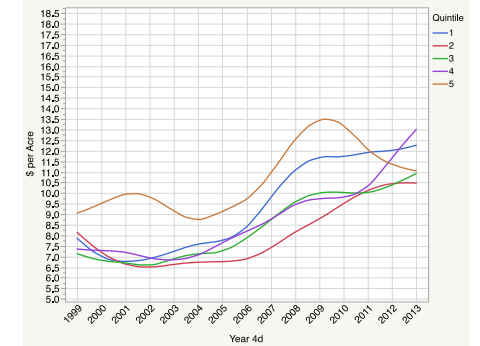


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Crop Production Costs

Machine Hire per Acre by Quintile



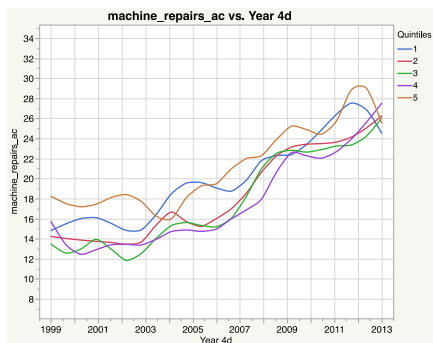
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Crop Production Costs

Machine Repairs per Acre by Quintile

Increasing



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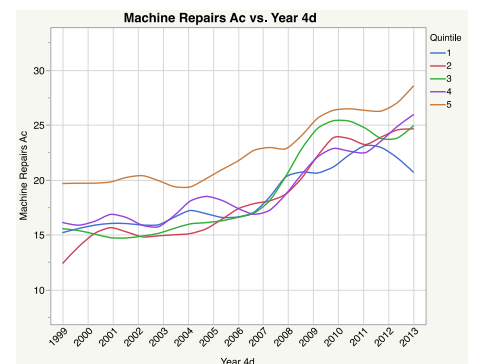
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Crop Production Costs - Southeast

Machine Repairs per Acre by Quintile

Increasing

Least profitable farms had the highest level



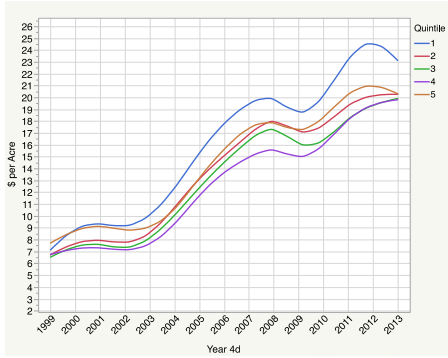
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Crop Production Costs

Fuel Costs per Acre by Quintile

Increasing



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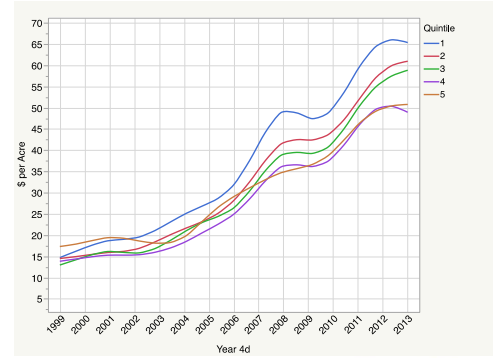
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Crop Production Costs

Fertilizer Costs per Acre by Quintile

Increasing fertilizer costs

The most profitable farms have the most fertilizer expense



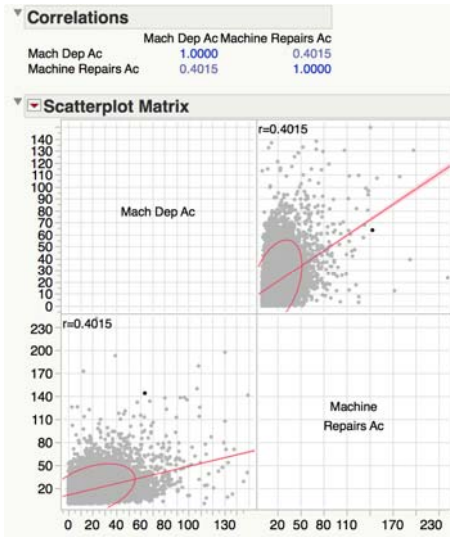
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How are Depreciation and Repairs Related?

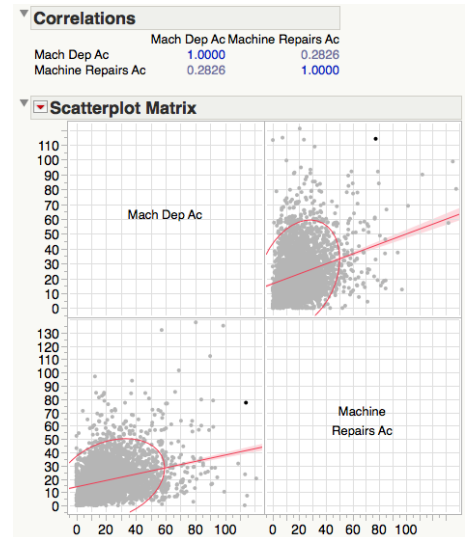
Entire state



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How are Depreciation and Repairs Related?

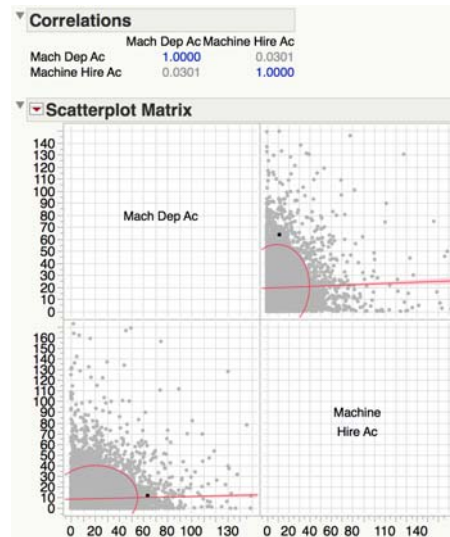
Southeast only



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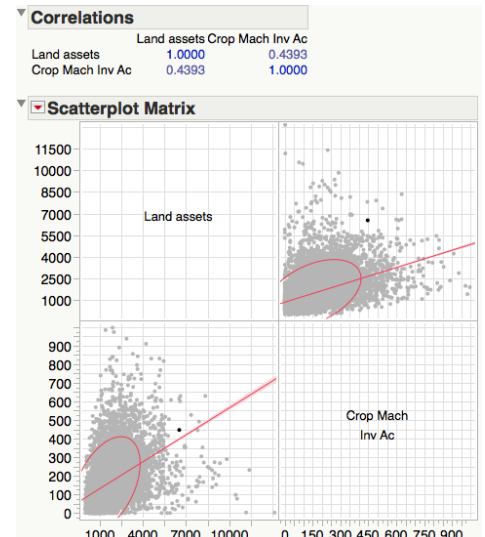
How are Depreciation and Machine Hire Related?

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How are Machinery Investments and Land Investments Related?

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Conclusions

- The most profitable farms had the highest depreciation and total crop expenses per acre
 - Not quite as pronounced at the region level
- Large increase in machinery investment
 - Due to more equipment, more expensive equipment, or newer equipment?
- Machinery costs as a percentage of total crop expenses is lowest on most profitable farms
 - Better land?
- Positive correlation between depreciation and repair and maintenance – not expected