

# Responsiveness of Costs to Crop Profit

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# Background

**Perfect World**

**The “Cost Side”**

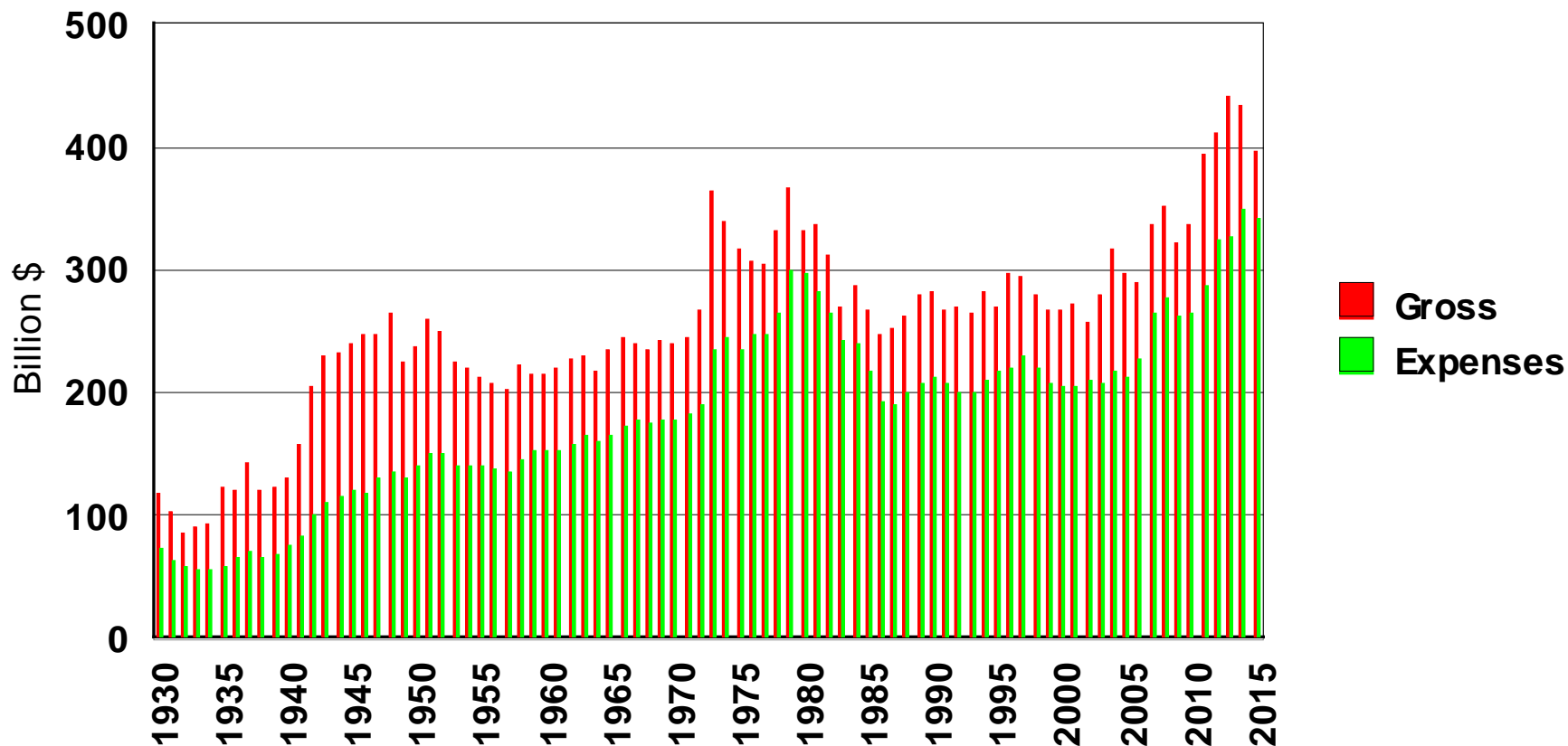
**Today’s Topics**

**Total Expenses**

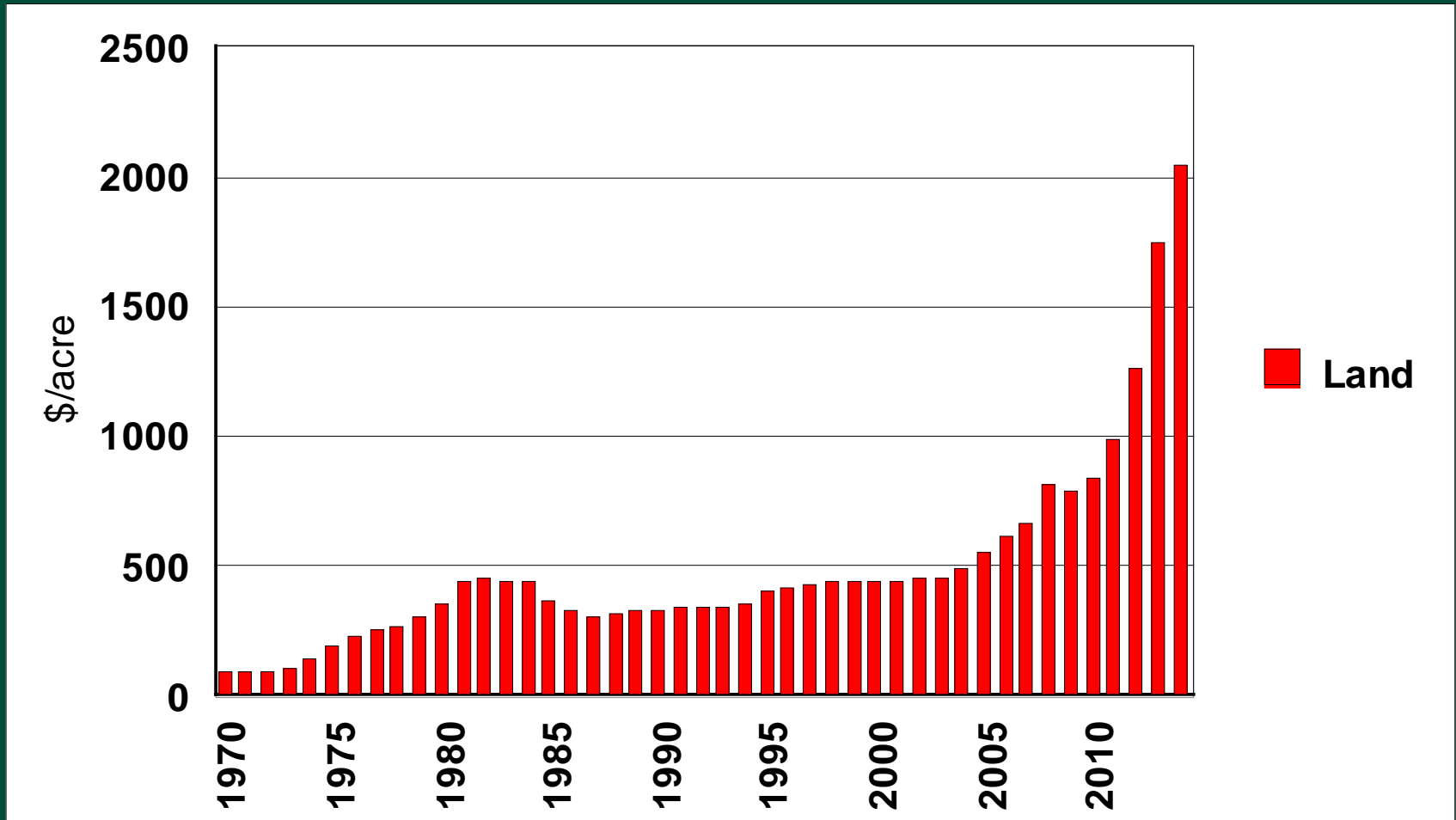
**Land Prices**

**Cash Rents**

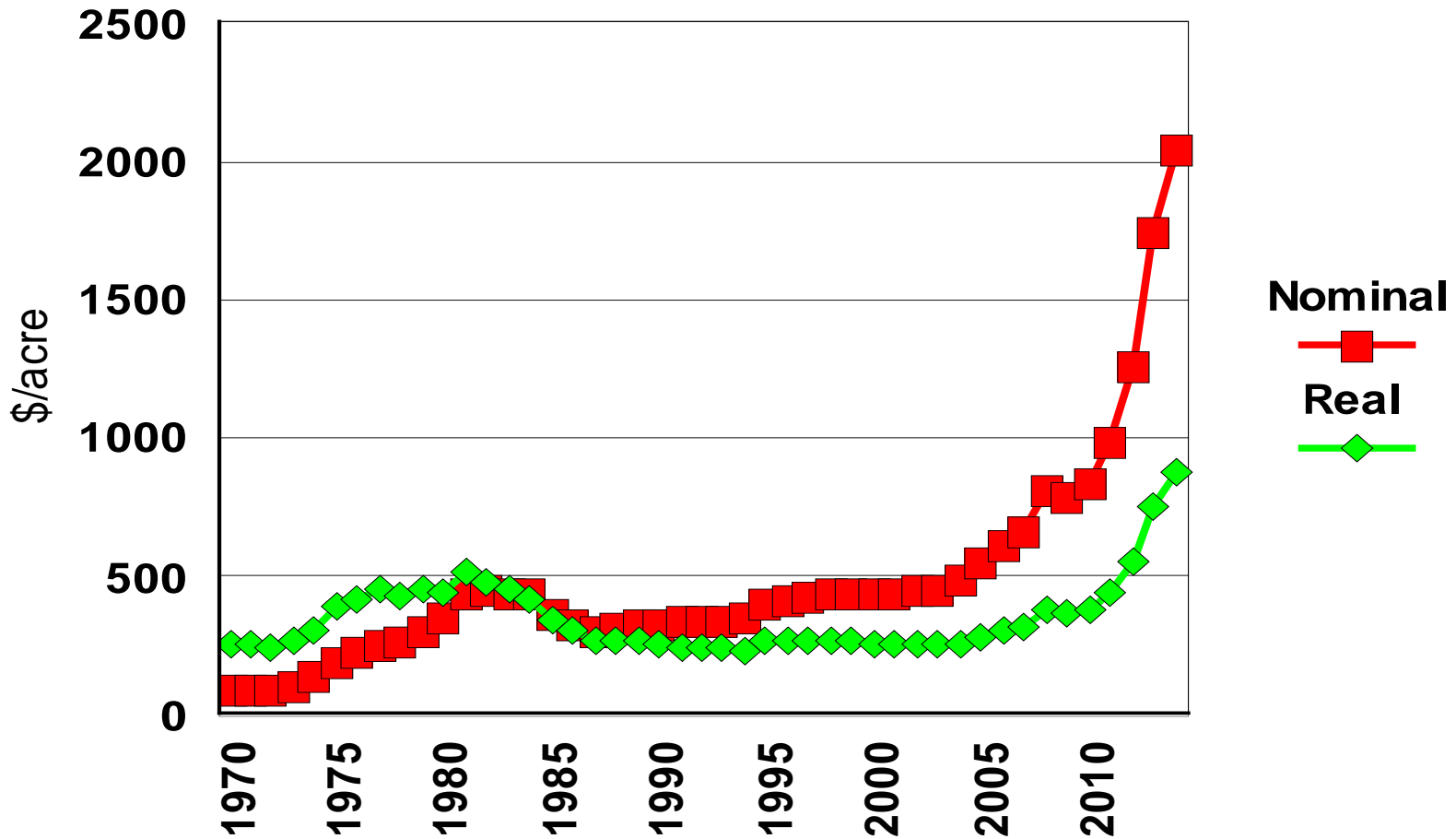
# Total Expenses verses Gross Returns



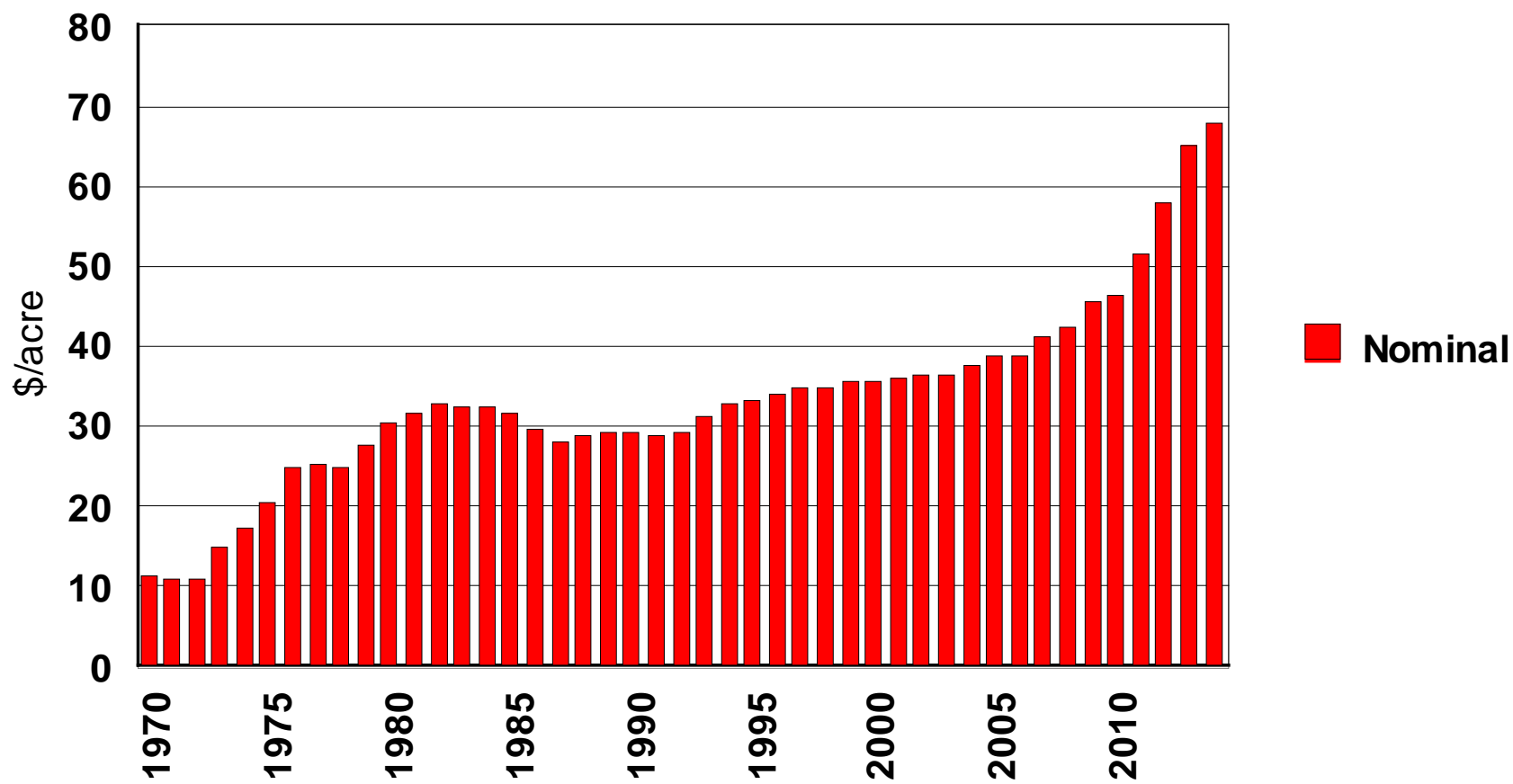
# North Dakota Land Prices



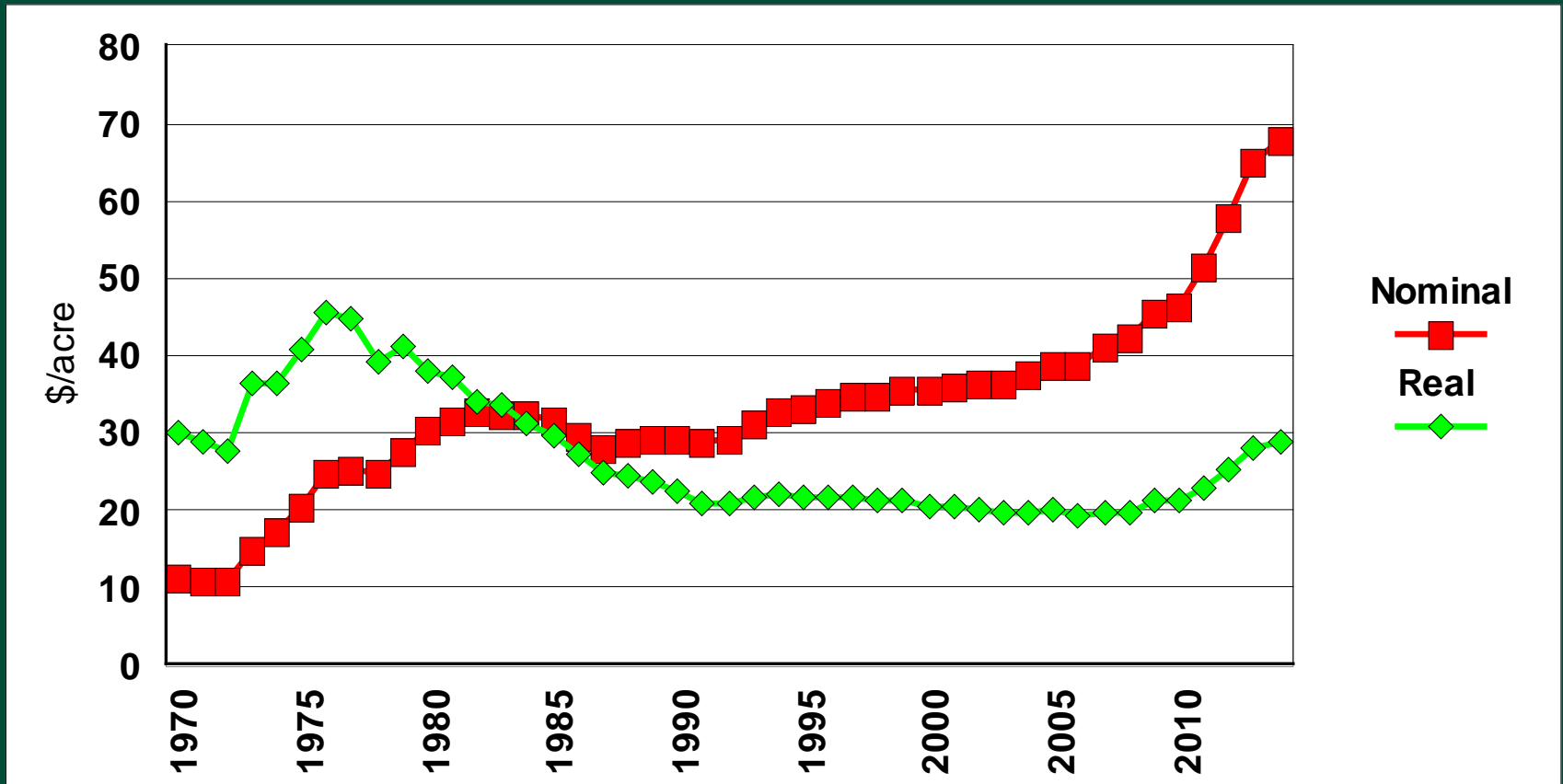
# Land Prices, Real and Nominal



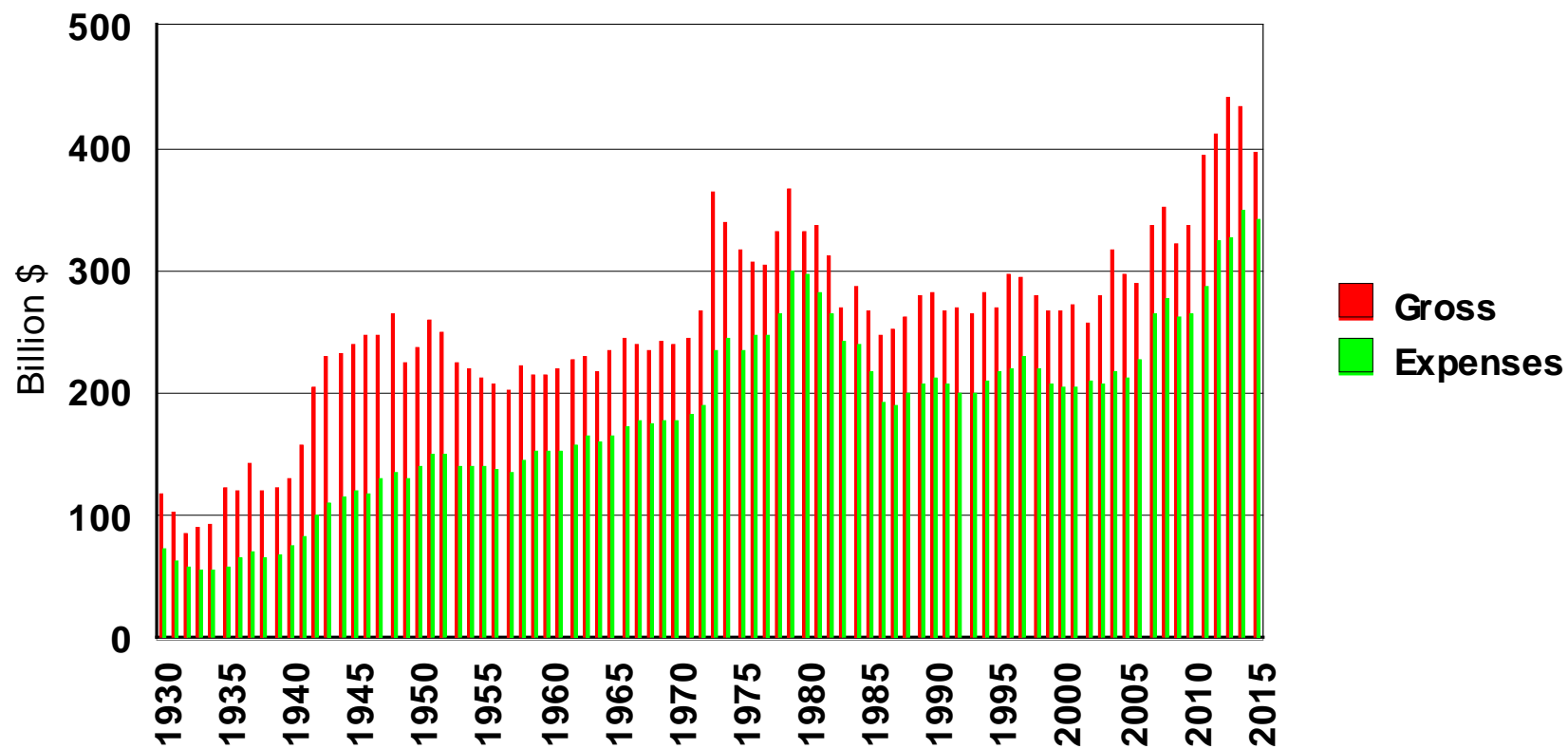
# North Dakota Average Cash Rent



# Cash Rent, Real and Nominal

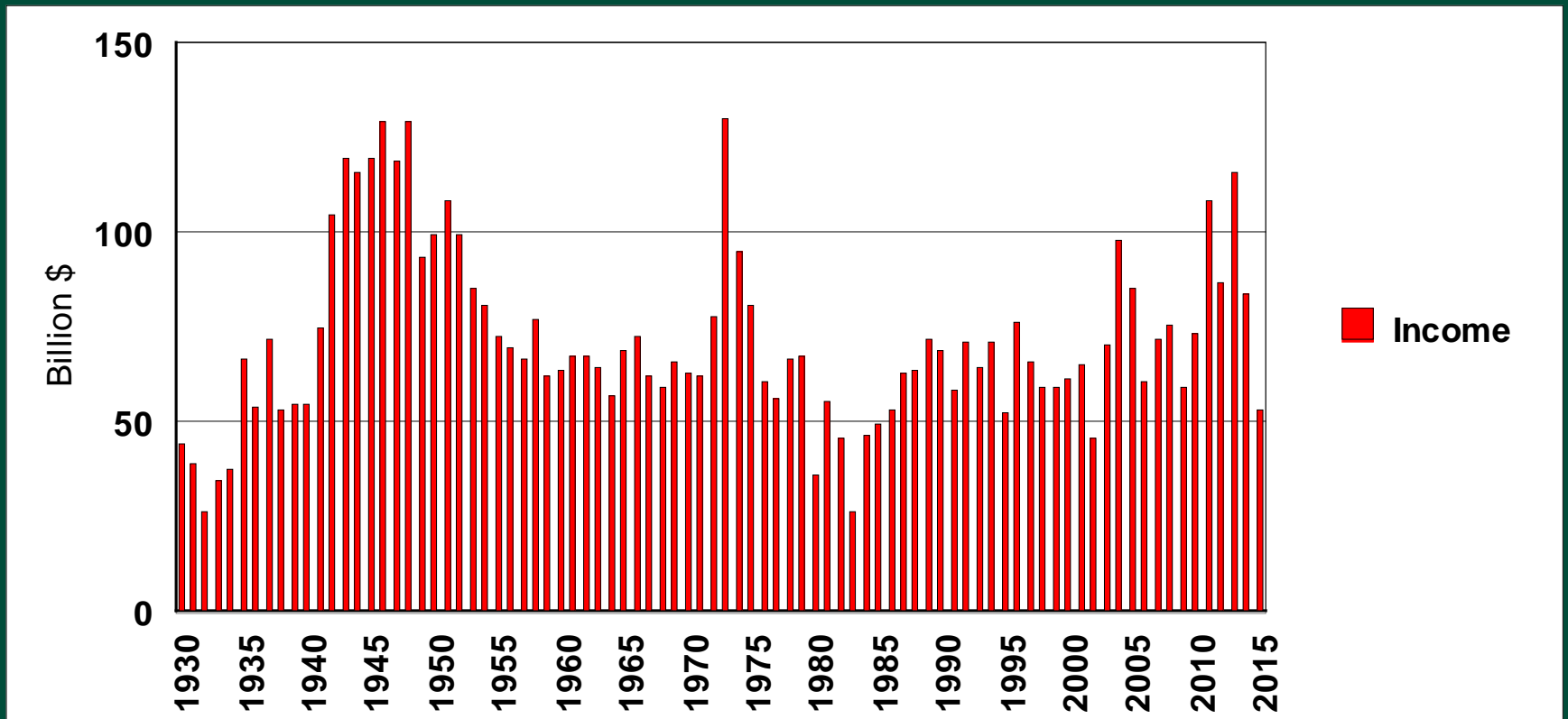


# Total Expenses verses Gross Returns

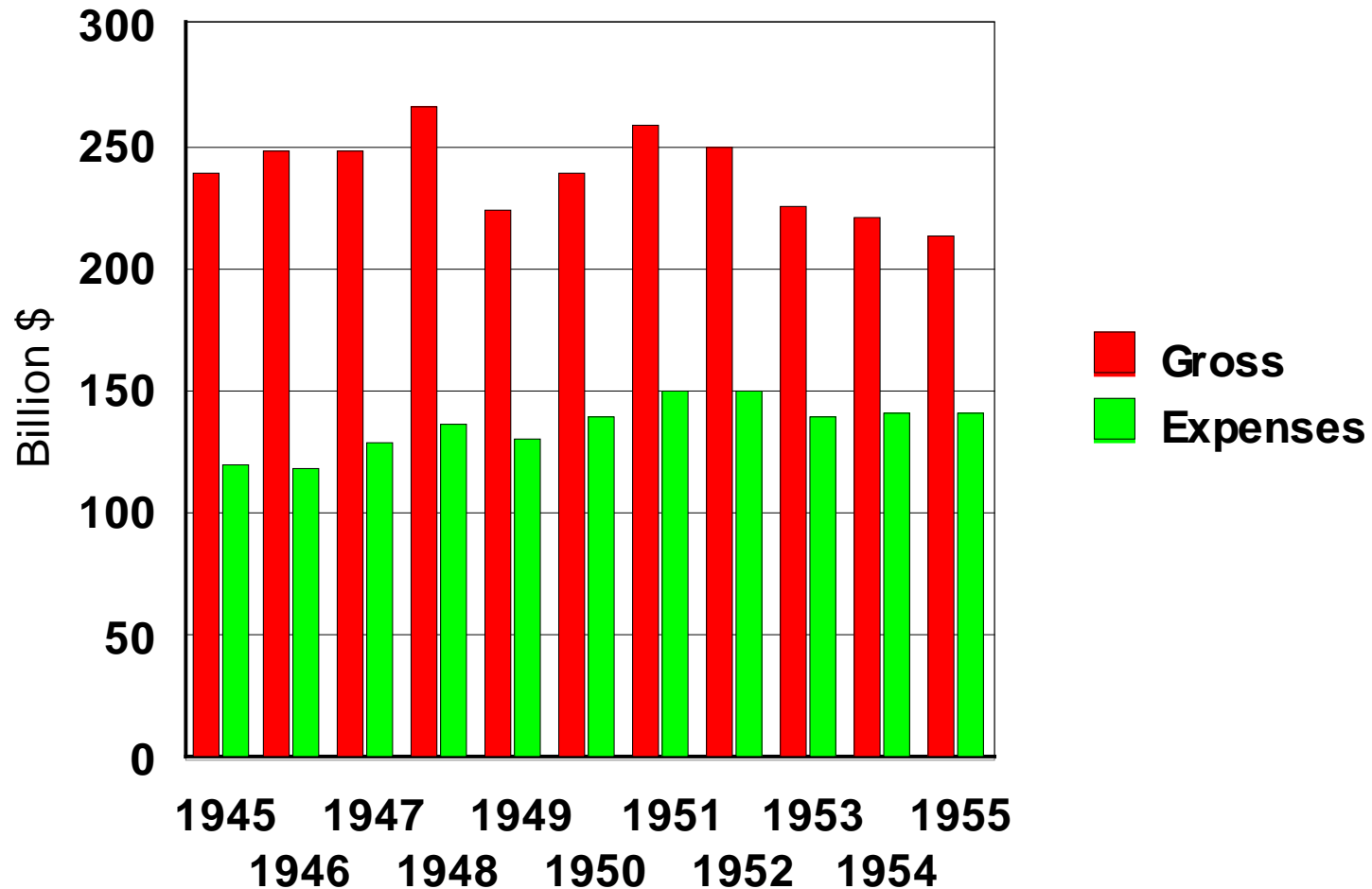




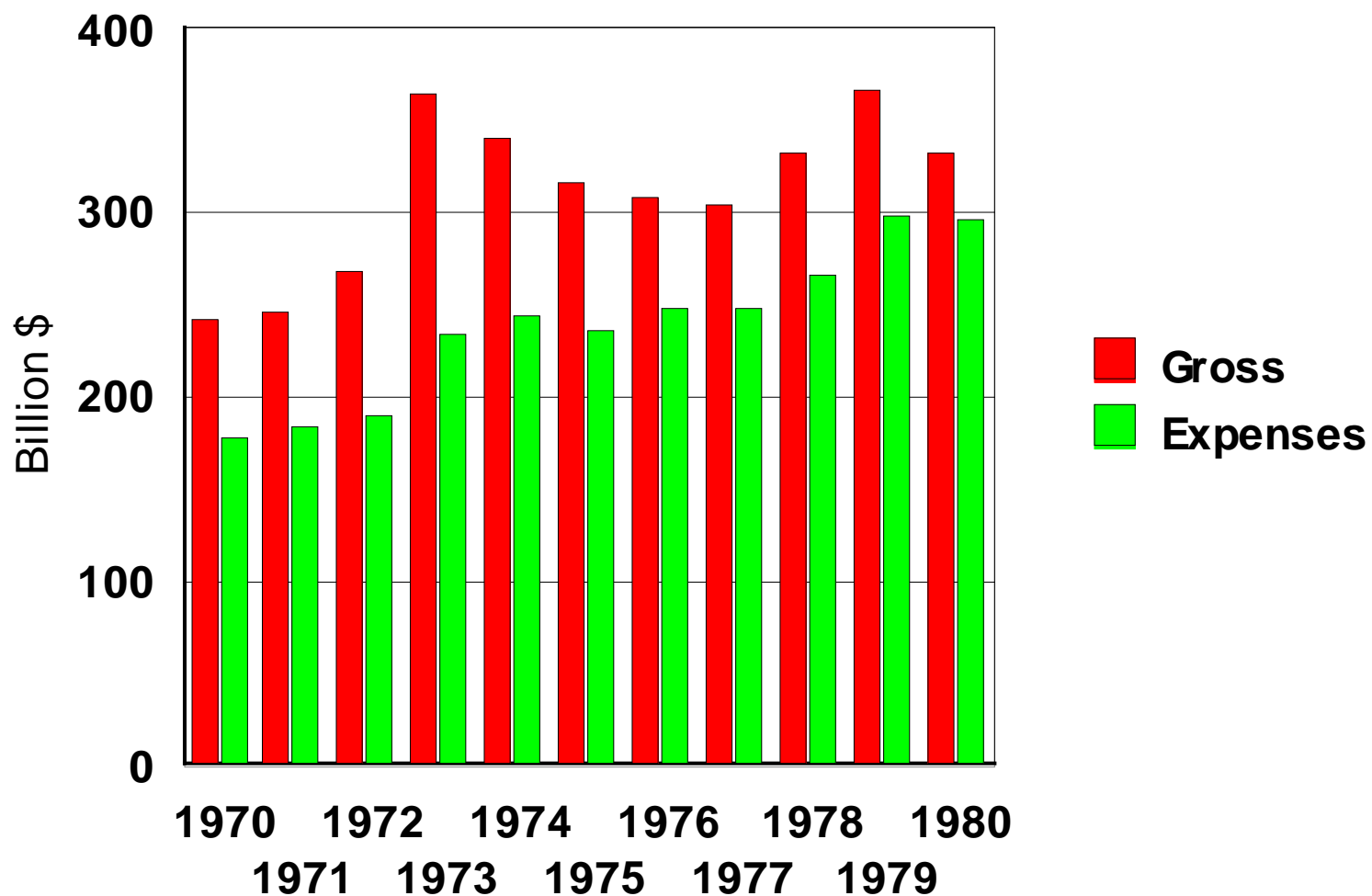
# Net Farm Income, real dollars



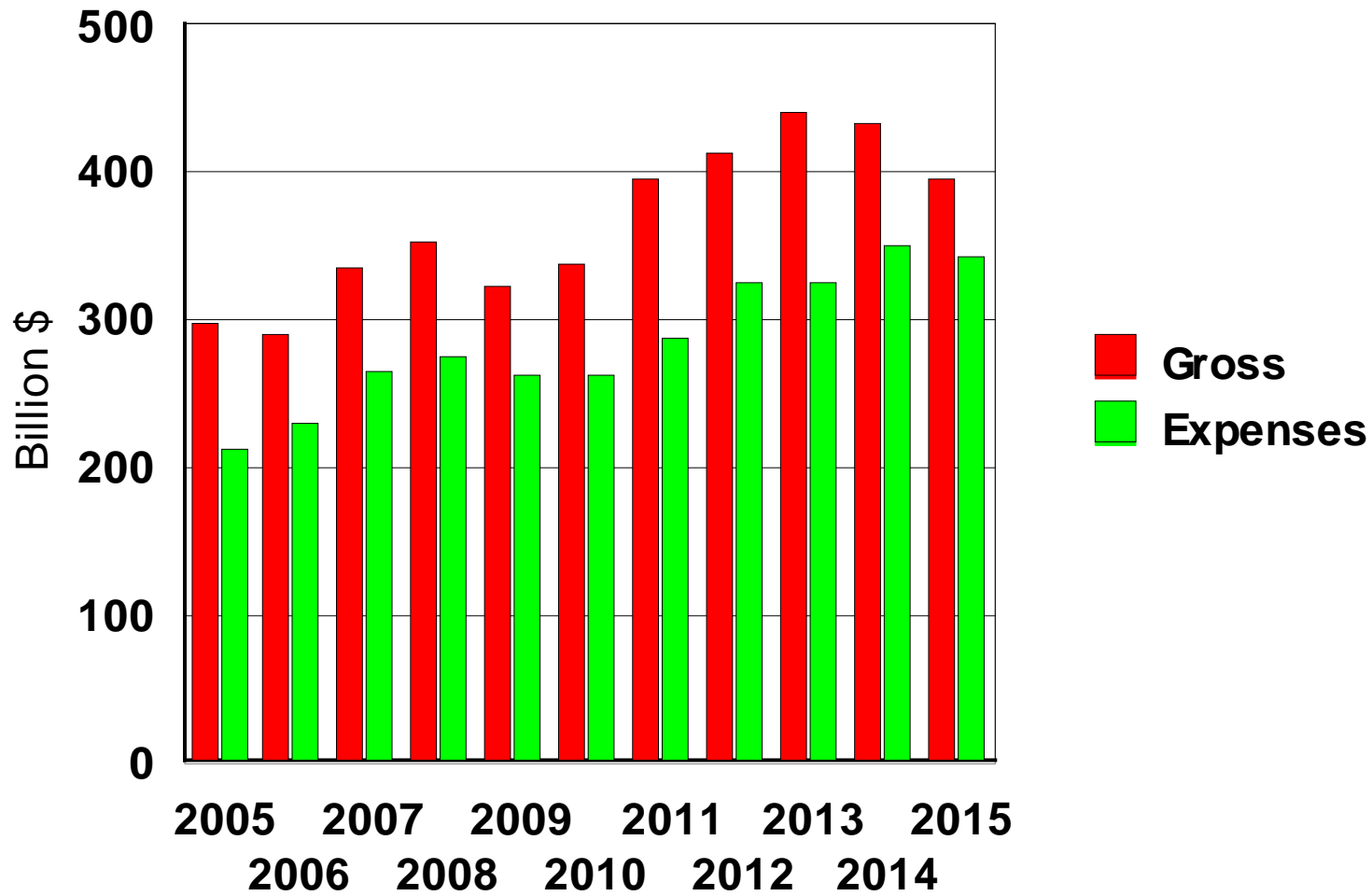
# Post WW II Gross Farm Receipts and Expenses



# Russian Grain Deal and Aftermath



# Change in US Energy Policy



# Asymmetry in Total Expense Changes

## Correlation Between Total Expenses and Gross Revenue

**C = 0.85**

### Regressions

**Exp = f(gross)  $R^2 = 0.72$**

**Exp = f(gross-1)  $R^2 = 0.62$**

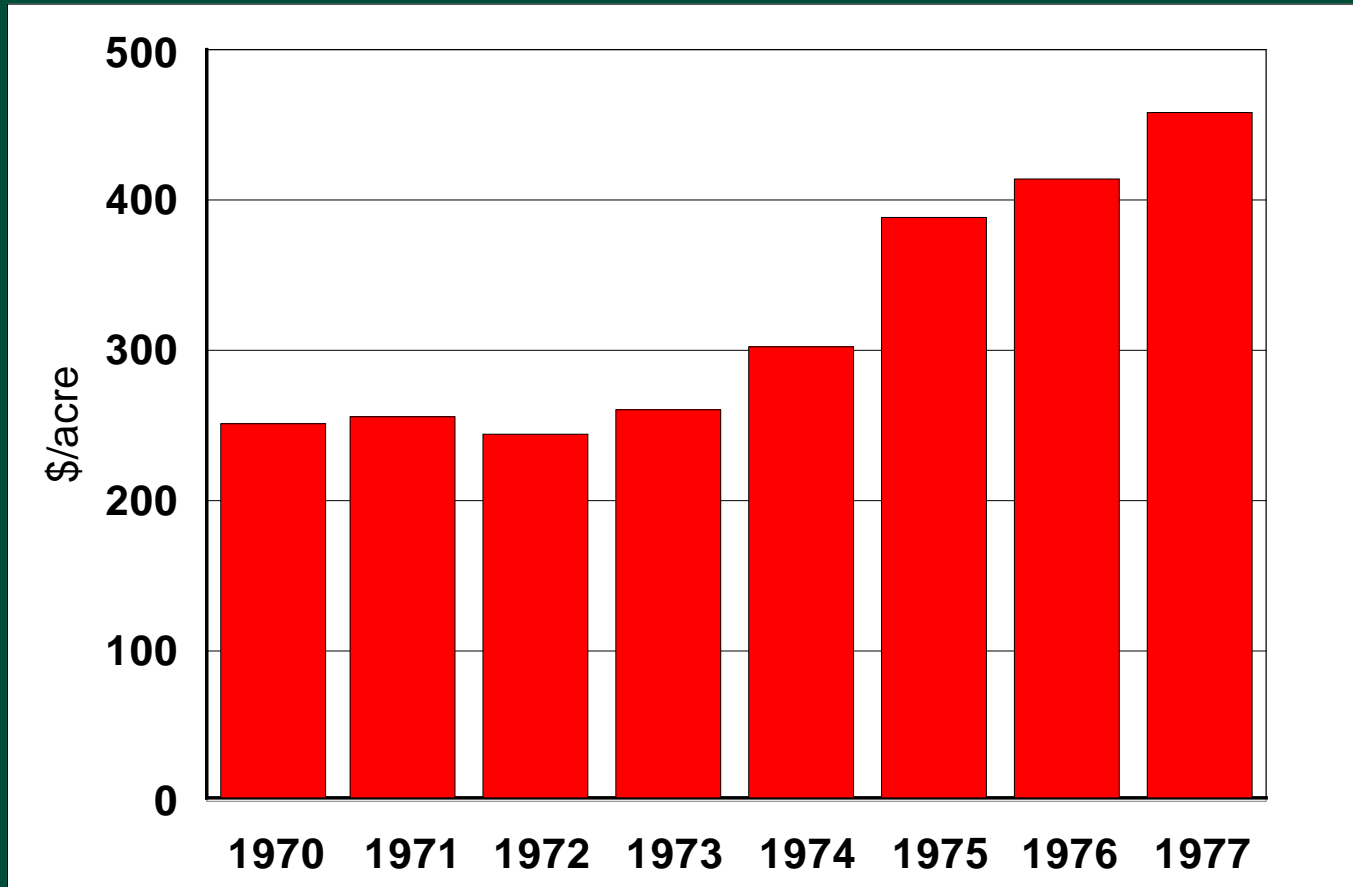
**Exp = f(gross-2)  $R^2 = 0.38$**

### Asymmetry of movements

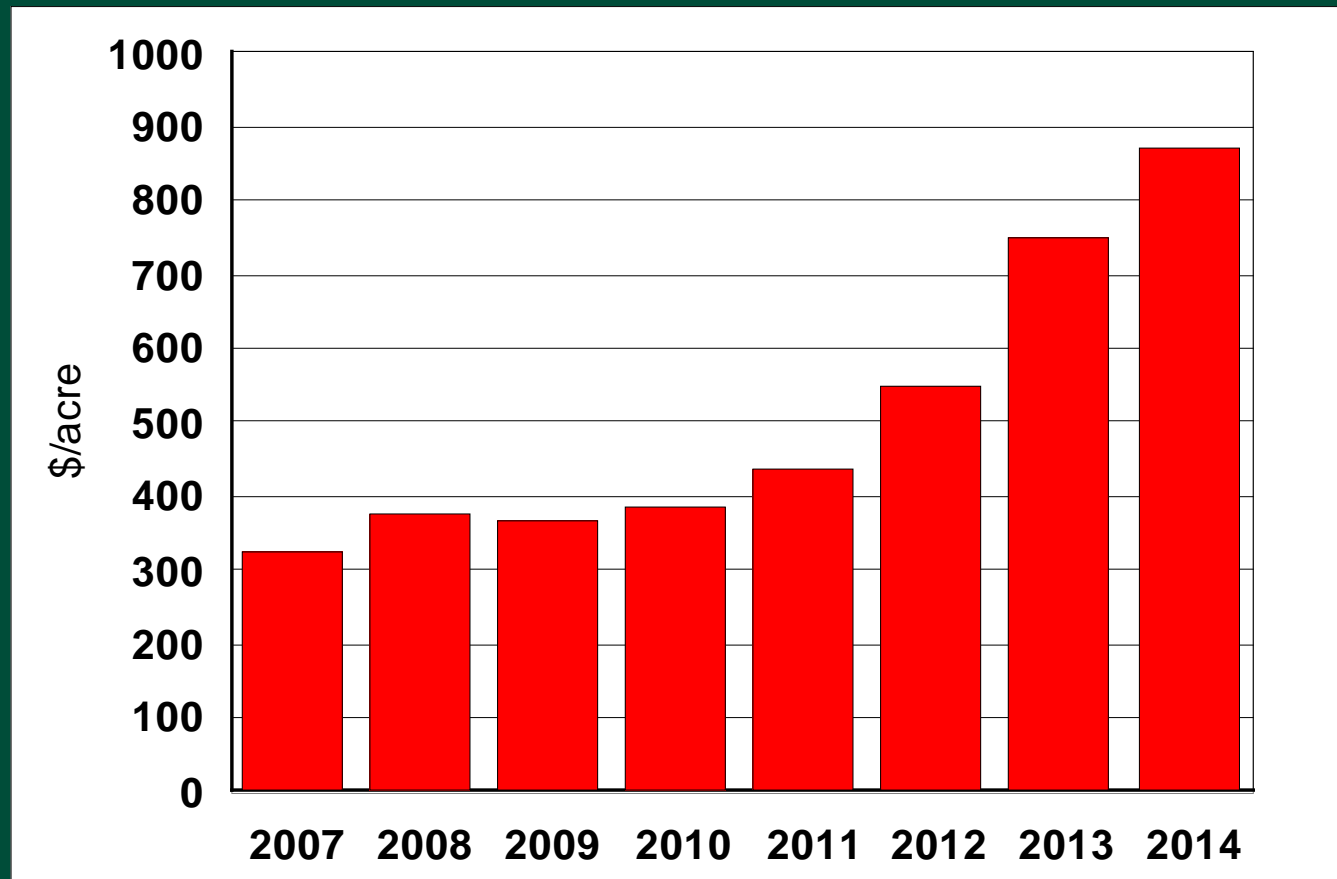
**Upward movements    10% change in gross returns  
4.3% upward movement**

**Downward movements 10% change in gross returns  
1.3% downward movement**

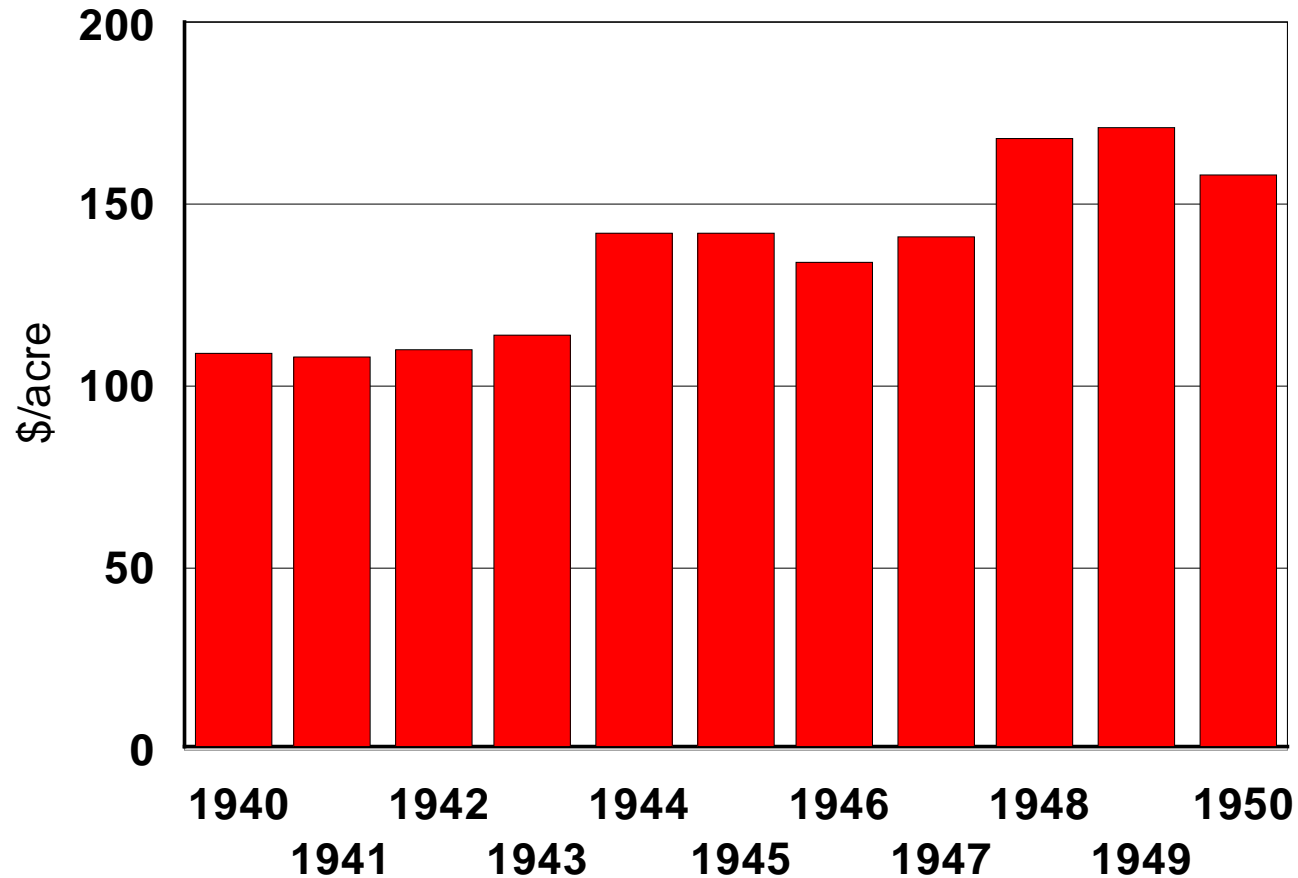
## North Dakota Land Prices, real dollars



# North Dakota Land Prices, real dollars



## North Dakota Land Prices, real dollars





# Asymmetry in Land Prices

**Correlation Between Land Prices and Ag Production**  
**C =0.80**

## **Regressions**

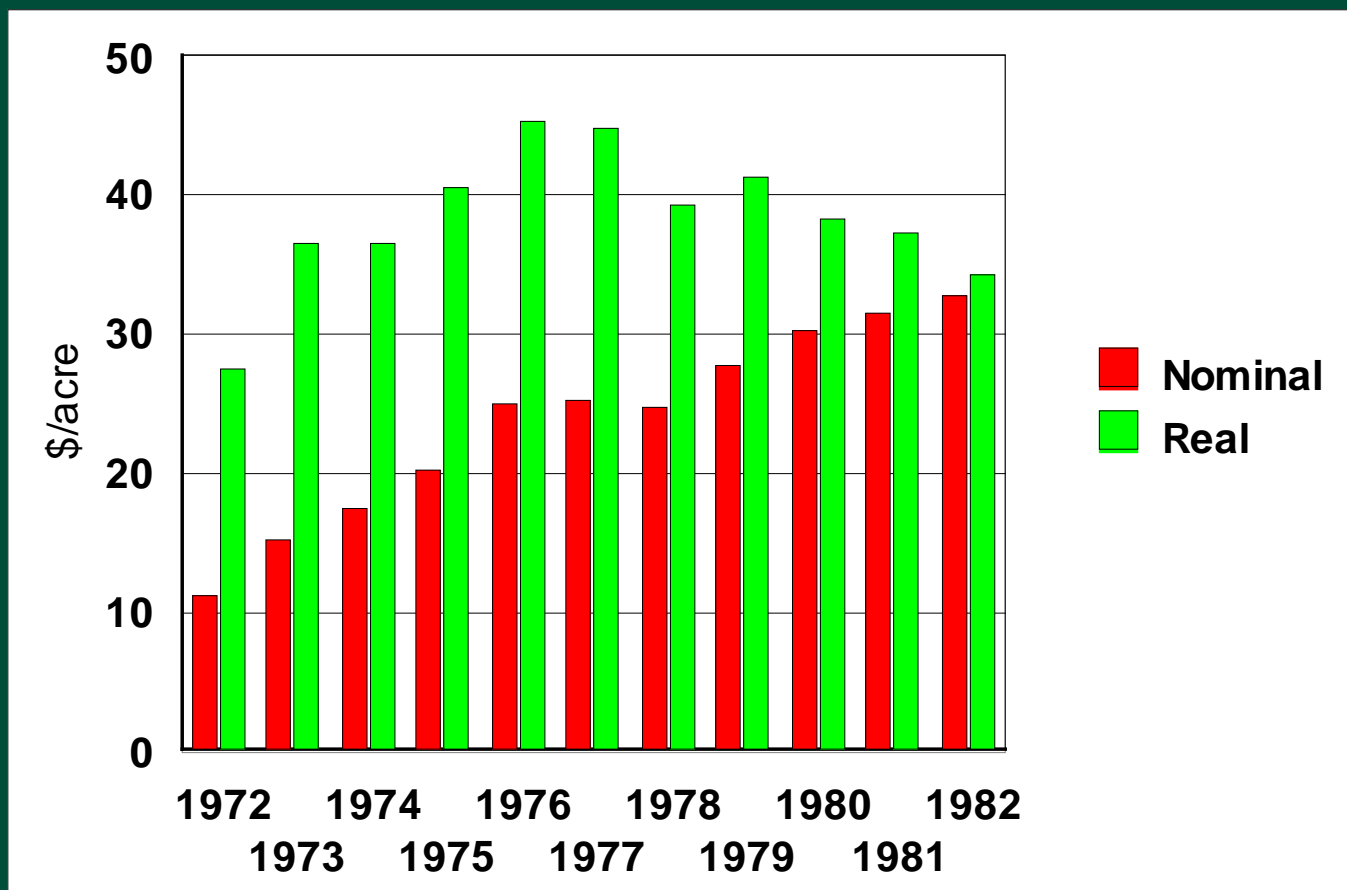
<b>Land =f(prod)</b>	<b><math>R^2 = 0.45</math></b>
<b>Land =f(prod-1)</b>	<b><math>R^2 = 0.57</math></b>
<b>Land =f(prod-2)</b>	<b><math>R^2 = 0.63</math></b>
<b>Land =f(prod-3)</b>	<b><math>R^2 = 0.54</math></b>

## **Asymmetry of movements**

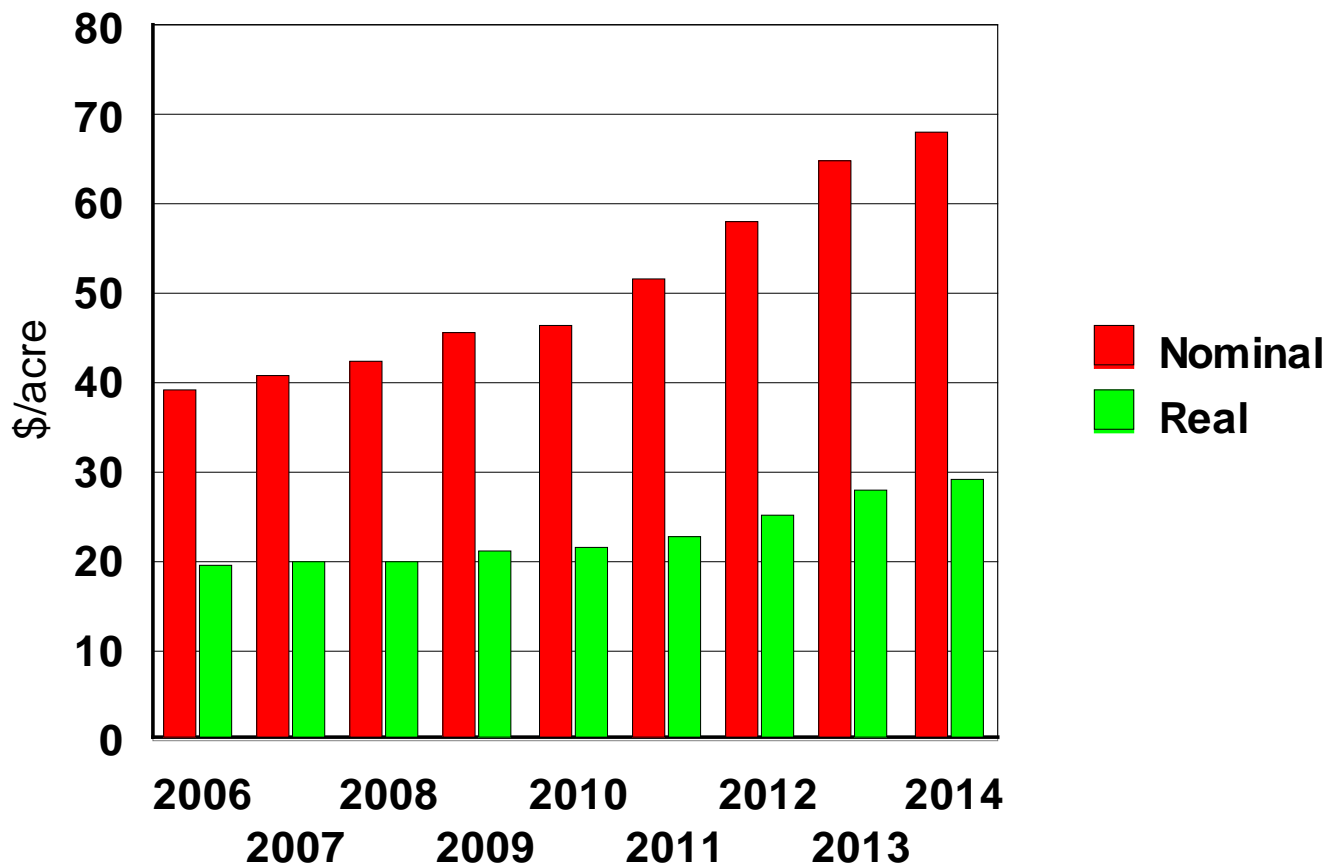
**Upward movements      10% change in ag production**  
**3.2% upward movement**

**Downward movements 10% change in ag production**  
**0.01% downward movement**

## North Dakota Average Cash Rent



## North Dakota Average Cash Rent



# **What is the Driving Force Behind Cash Rents?**

## **Land Prices**

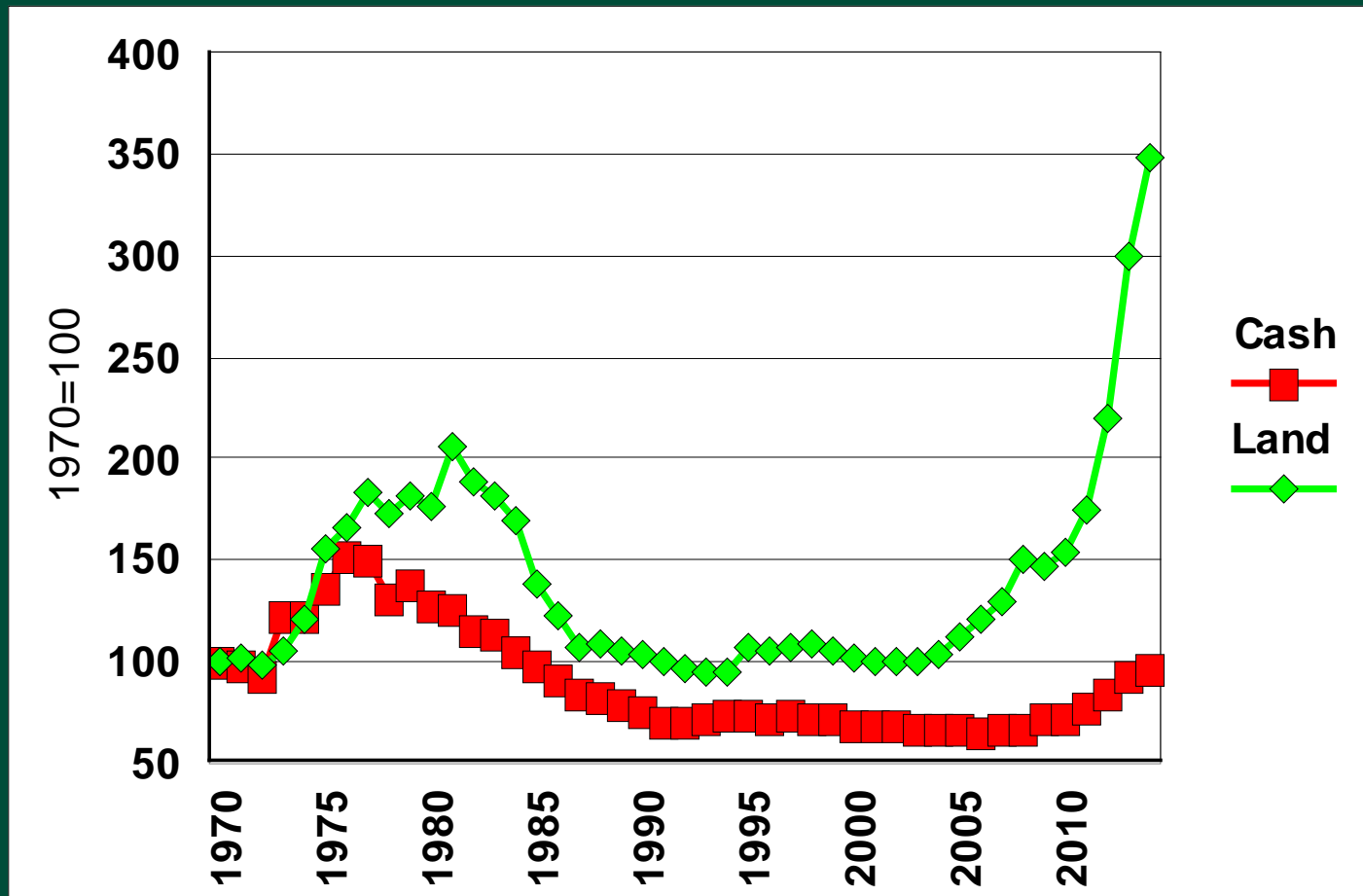
# What is the Driving Force Behind Cash Rents?

**Ag Production**

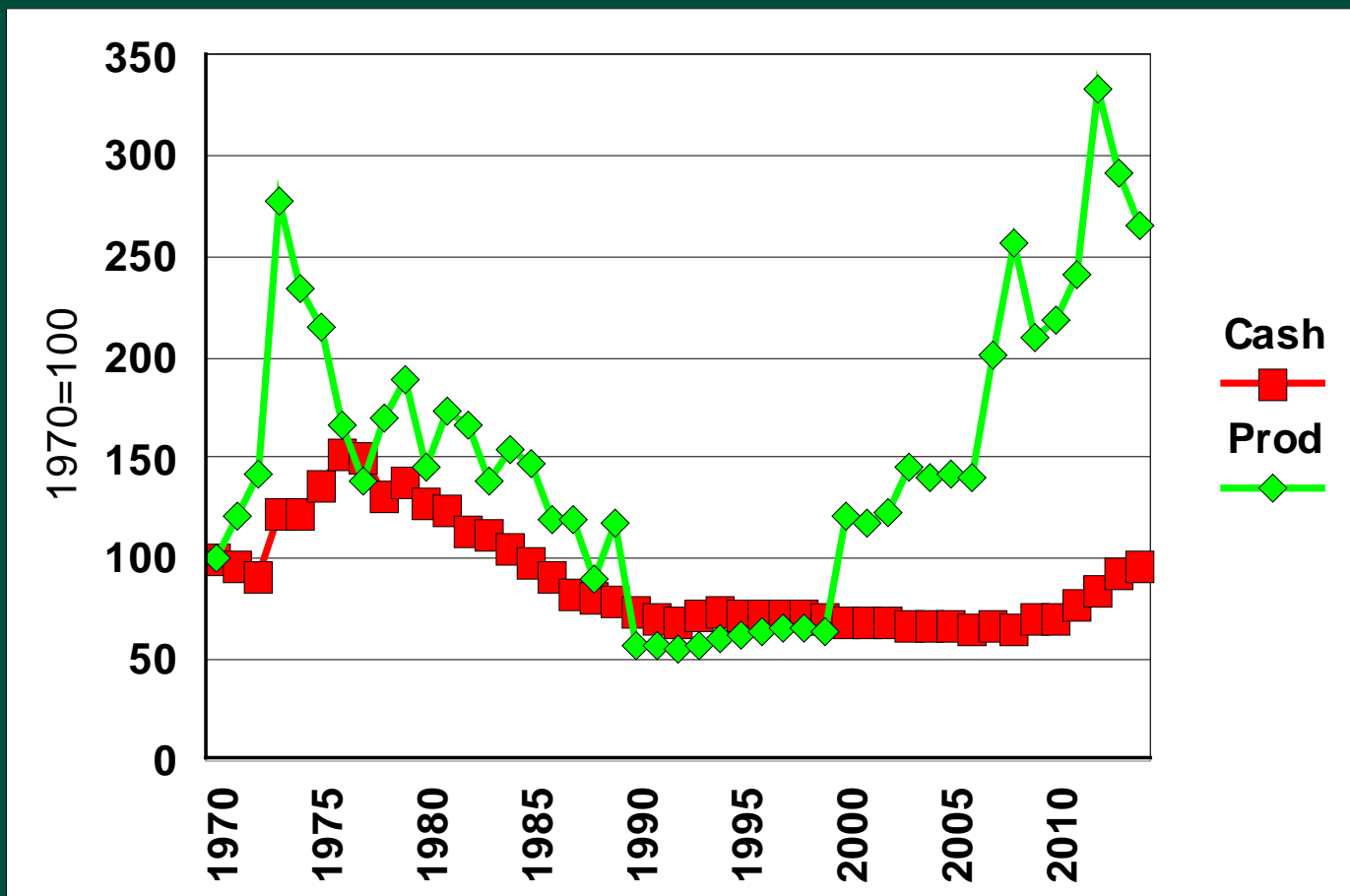
# **What is the Driving Force Behind Cash Rents?**

**Net Farm Income**

# North Dakota Average Cash Rent and Land Price

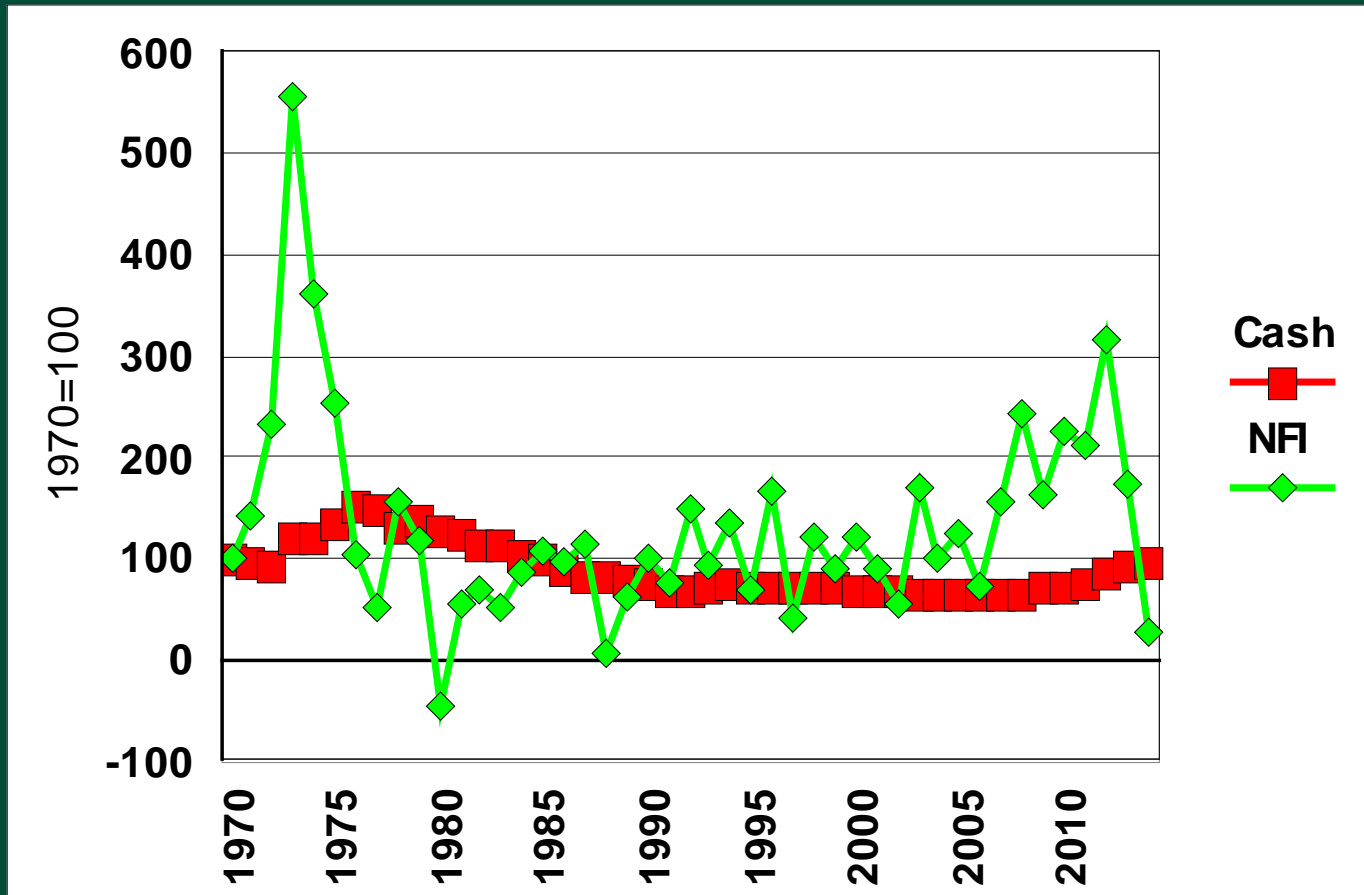


# North Dakota Average Cash Rent and Ag Production





# North Dakota Average Cash Rent and Net Cash Income



# Correlations

<b>Cash Rent and NFI</b>	<b>C =0.52</b>
<b>Cash Rent and Ag Prod</b>	<b>C =0.56</b>
<b>Cash Rent and Land Price</b>	<b>C =0.50</b>

# Asymmetry in Cash Rent

## Regressions

Cash =f(NFI)  $R^2 = 0.01$

Cash =f(NFI-1)  $R^2 = 0.25$

Cash =f(NFI-2)  $R^2 = 0.39$

Cash =f(NFI-3)  $R^2 = 0.49$

Cash =f(NFI-4)  $R^2 = 0.52$

## Asymmetry of movements

Upward movements 10% change in net farm income  
0.02% upward movement

Downward movements 10% change in net farm income  
0.04% downward movement

# Closing Thoughts

**Total Farm Expenses**

**Land Price**

**Cash Rent**

# Closing Thoughts

## Total Farm Expenses

Gross Receipts -- No lag

Asymmetrical

3 times faster

## Land Price

Ag Production -- 2 year lag

Asymmetrical

Many times faster

## Cash Rent

Net Farm Income --4 year lag

Symmetrical

# Conclusions and Takeaways

**Farm expenses will continue to fall but very slowly**

**Land prices will fall very slowly but will lag ag production by at least 2 years**

**Cash rents will fall but will lag net farm income by 4 years**

**This current price cycle is not going away rapidly**

**May take many years for higher prices to return**

# Questions?