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Hedonic Hierarchical Clustering of Cash Prices for Corn and Soybeans

(OLD TITLE)



Spatial Volatility in Corn Cash Prices

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Introduction

- ▶ We know cash prices correlated with futures price
- ▶ We know spatial price transmission occurs
 - ▶ TAR and MTAR models have (sort of) looked at this
- ▶ Why have previous studies not included spatial information in local cash markets for commodities?

Background

- ▶ TAR and MTAR models do not use any spatial information
 - ▶ Assume model implicitly accounts for spatial components
- ▶ Cash markets for ag commodities are inconsistent
 - ▶ Most of the data are incomplete for various reasons
 - ▶ Reporting
 - ▶ USDA tracking
 - ▶ Time differences (Daily vs. Weekly vs. Monthly)



The screenshot shows the USDA Market News website. The header features the USDA logo and the text "United States Department of Agriculture Agricultural Marketing Service". Navigation links include "About AMS", "News & Announcements", "Careers", "For Employees", and "Contact Us". A search bar is present with a "Search" button. Below the header, a menu bar lists "Market News", "Rules & Regulations", "Grades & Standards", "Services", "Resources", and "Selling Food to USDA". A "Stay connected" section displays social media icons for Facebook, Twitter, YouTube, Email, Flickr, RSS, and Instagram. The main content area is titled "Market News" and includes a list of categories: Cotton, Dairy, Livestock, Poultry & Grain, Specialty Crops, Tobacco, Local & Regional Food Marketing, Organic, and Retail. Below this, there are links for "Run a Custom Report", "Subscribe to Standard Reports", "Search Market News", and "Contacts". A "Related Websites" section lists the Foreign Agricultural Service (FAS), National Agricultural Statistics Service (NASS), Economic Research Service (ERS), Farm Service Agency (FSA), and Market Information Organization of the Americas. A large image shows two people looking at a document in a market setting. To the right of the image is a "USDA Market News" section with a "SHARE" button and a "Contact Market News" button. The text describes the history and purpose of the service, stating that for 100 years, AMS has provided free, unbiased price and sales information to assist in the marketing and distribution of farm commodities. It mentions that each year, Market News issues thousands of reports, providing the industry with key wholesale, retail and shipping data. The reports give farmers, producers and other agricultural businesses the information they need to evaluate market conditions, identify trends, make purchasing decisions, monitor price patterns, evaluate transportation equipment needs and accurately assess movement. A list titled "Market News captures data for:" includes Cotton, Dairy & milk products, Fruits, vegetables & specialty crops, Livestock, meats, poultry, eggs, grain & hay, Organic, Tobacco, and Local & regional foods.

USDA Market News

For 100 years, AMS has provided free, unbiased price and sales information to assist in the marketing and distribution of farm commodities. Each year, Market News issues thousands of reports, providing the industry with key wholesale, retail and shipping data.

The reports give farmers, producers and other agricultural businesses the information they need to evaluate market conditions, identify trends, make purchasing decisions, monitor price patterns, evaluate transportation equipment needs and accurately assess movement.

Market News captures data for:

- Cotton
- Dairy & milk products
- Fruits, vegetables & specialty crops
- Livestock, meats, poultry, eggs, grain & hay
- Organic
- Tobacco
- Local & regional foods

Objectives

- ▶ Find a (mostly) complete time series on corn cash prices with multiple locations.
- ▶ Estimate a GARCH model with explicit spatial information
- ▶ Extrapolate to discuss price risk management



Data

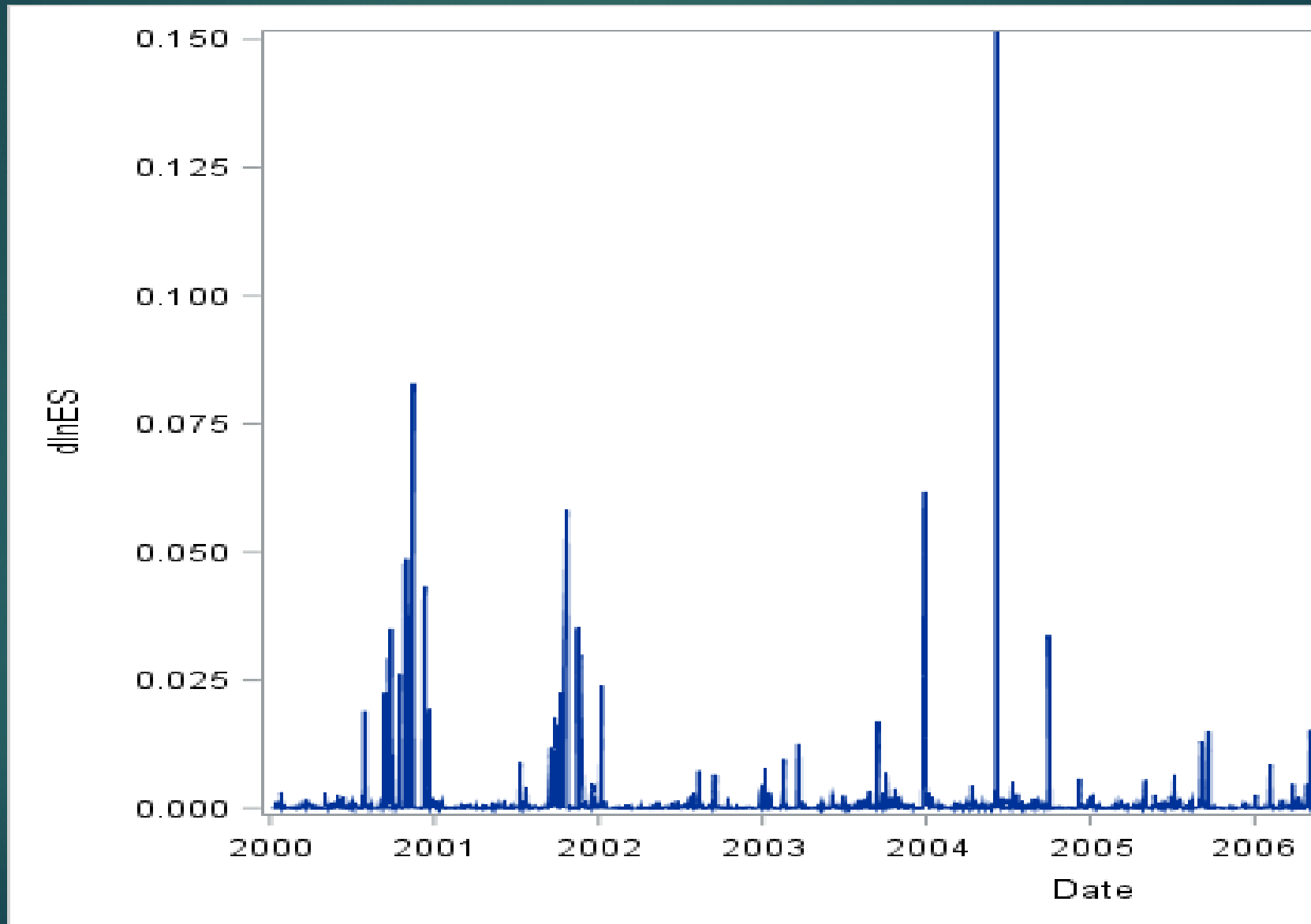
- ▶ Virginia Corn Markets
 - ▶ Daily data between January 1, 2000 – June 1, 2006
- ▶ 6 locations across the state
 - ▶ Eastern Shore
 - ▶ Harrisonburg
 - ▶ Petersburg
 - ▶ Wakefield
 - ▶ Tappahannock
 - ▶ Culpepper



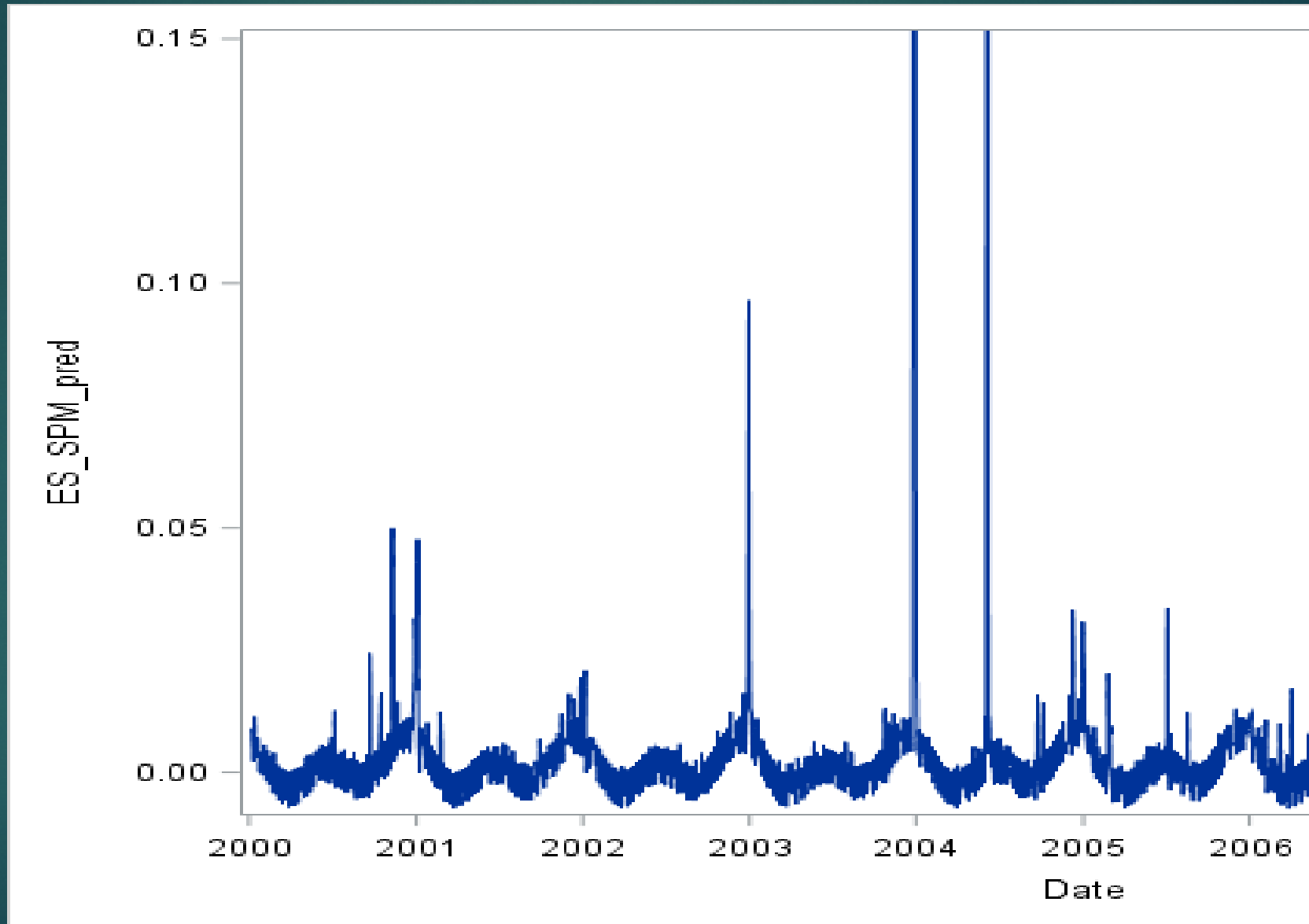
Model

- ▶ Multivariate Spatial GARCH model (squared returns)
 - ▶ Trading days
 - ▶ Day of the week effects
 - ▶ Spatial Weight Matrix for Road/Driving Distance
- ▶ Spatial Weight Matrix of ARCH and GARCH parameter
 - ▶ Accounts for transportation costs
 - ▶ Could compare to linear distance (Haverstine)

Eastern Shore Corn Cash Market Returns

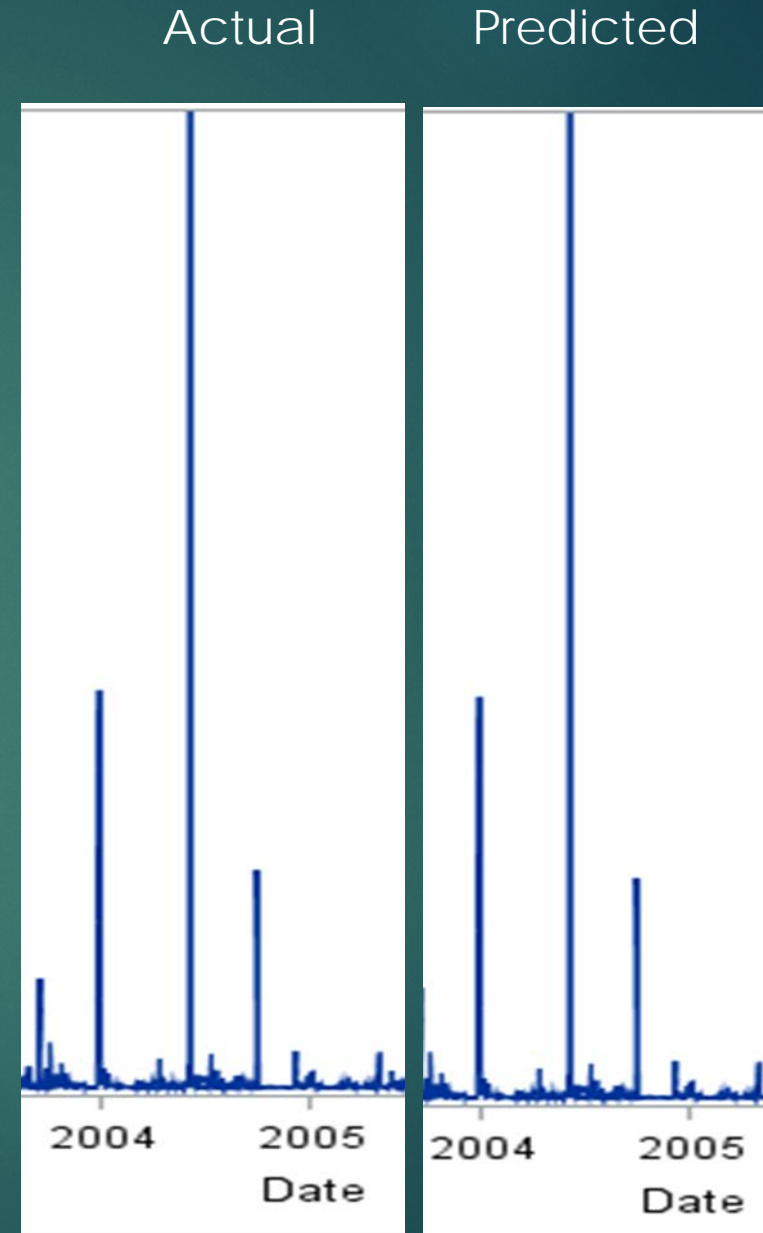


Spatial M-GARCH Predicted Returns



Results

- ▶ Asymmetric effects across locations
 - ▶ Spatial parameters are not always significant
- ▶ Predictions follow spikes better with spatial parameters



Implications

- ▶ It is important to consider other local cash markets
- ▶ This could help with previously identified non-normality issues
- ▶ Spatial price transmission is important
- ▶ Producers need to observe all markets in the state (at least relevant ones in regards to those that are potentially substitutable)



Thank You!

ANY QUESTIONS?