

Accuracy of Prediction of Future Uniform Milk Prices in Florida from Class III and IV Futures Markets

Albert De Vries
Shiferaw Feleke

Department of Animal Sciences
University of Florida
devries@ufl.edu



Introduction

1. Accurately predicted future farm milk prices may be useful in dairy herd management.
2. Federal Order 6 uniform milk price (Tampa, Hillsborough county) is a proxy for Florida farm milk price.
3. Milk prices depend on use of milk:
 - Class I milk: fluid milk
 - Class II milk: ice cream, yoghurt
 - Class III milk: cheese
 - Class IV milk: butter

F.O. 6 Uniform Milk Price

Uniform milk price is function of 17 inputs:

- Announced and advanced butter prices
- Product prices for cheese, butter, dry whey, non fat dry milk
- Utilization of Class I, II, III, IV skim milk
- Utilization of Class I, II, III, IV butterfat
- Class I price differential
- Class III and Class IV cash prices

Prices and utilization announced every month by
USDA

Class III and IV Futures Market

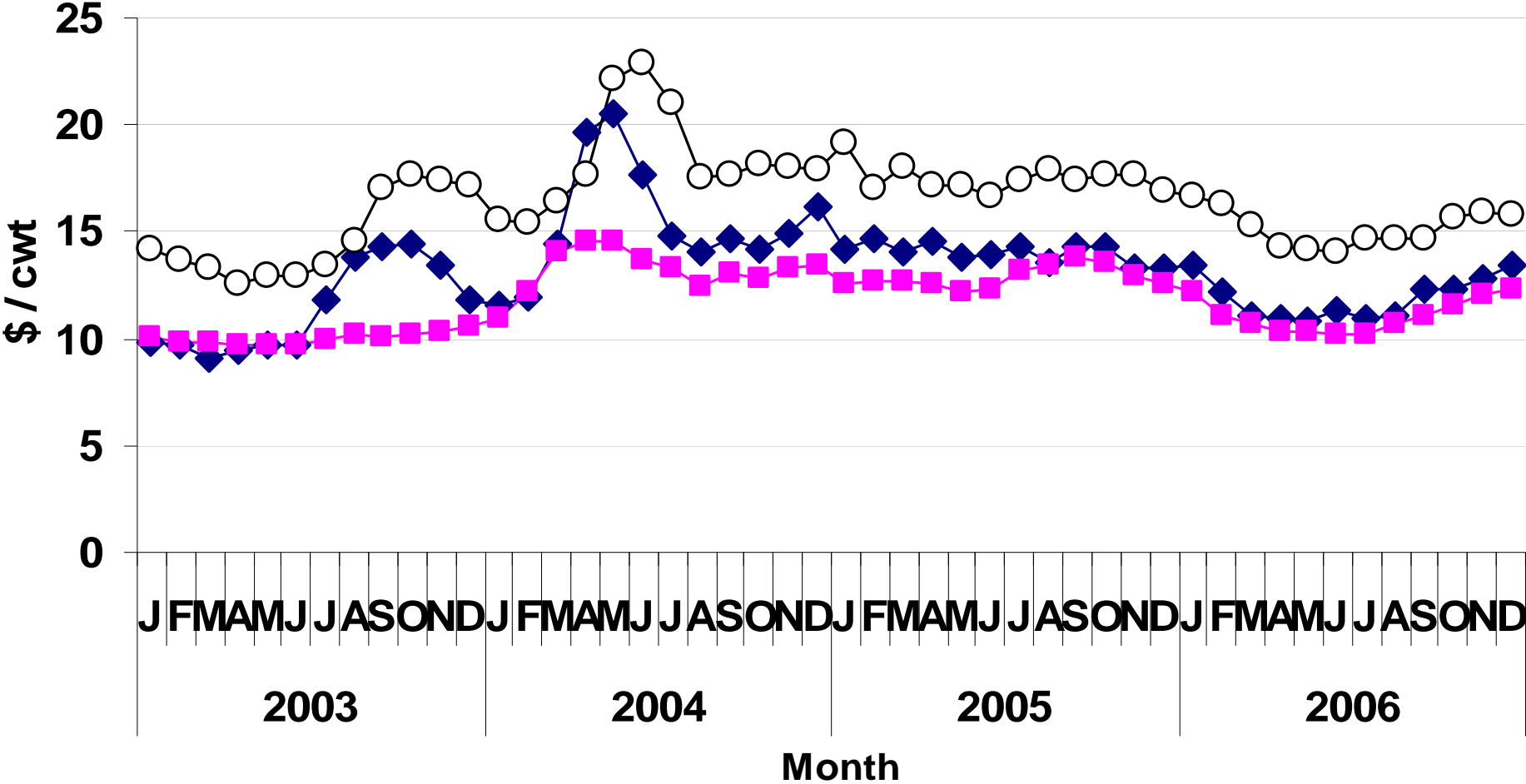
- Futures contracts traded at Chicago Mercantile Exchange for “delivery” of milk up to 18 months into the future.
- USDA announces the Class III and Class IV cash prices around 5th of the following month.
- Futures market theory: in an efficient market, futures prices are unbiased predictors of cash prices.
 - Futures prices predict the USDA announced cash prices

Actual Prices

◆ Class III

■ Class IV

○ Uniform (Tampa)



Objective

- Evaluate accuracy of a method to predict uniform milk price in Florida from Class III and IV futures markets

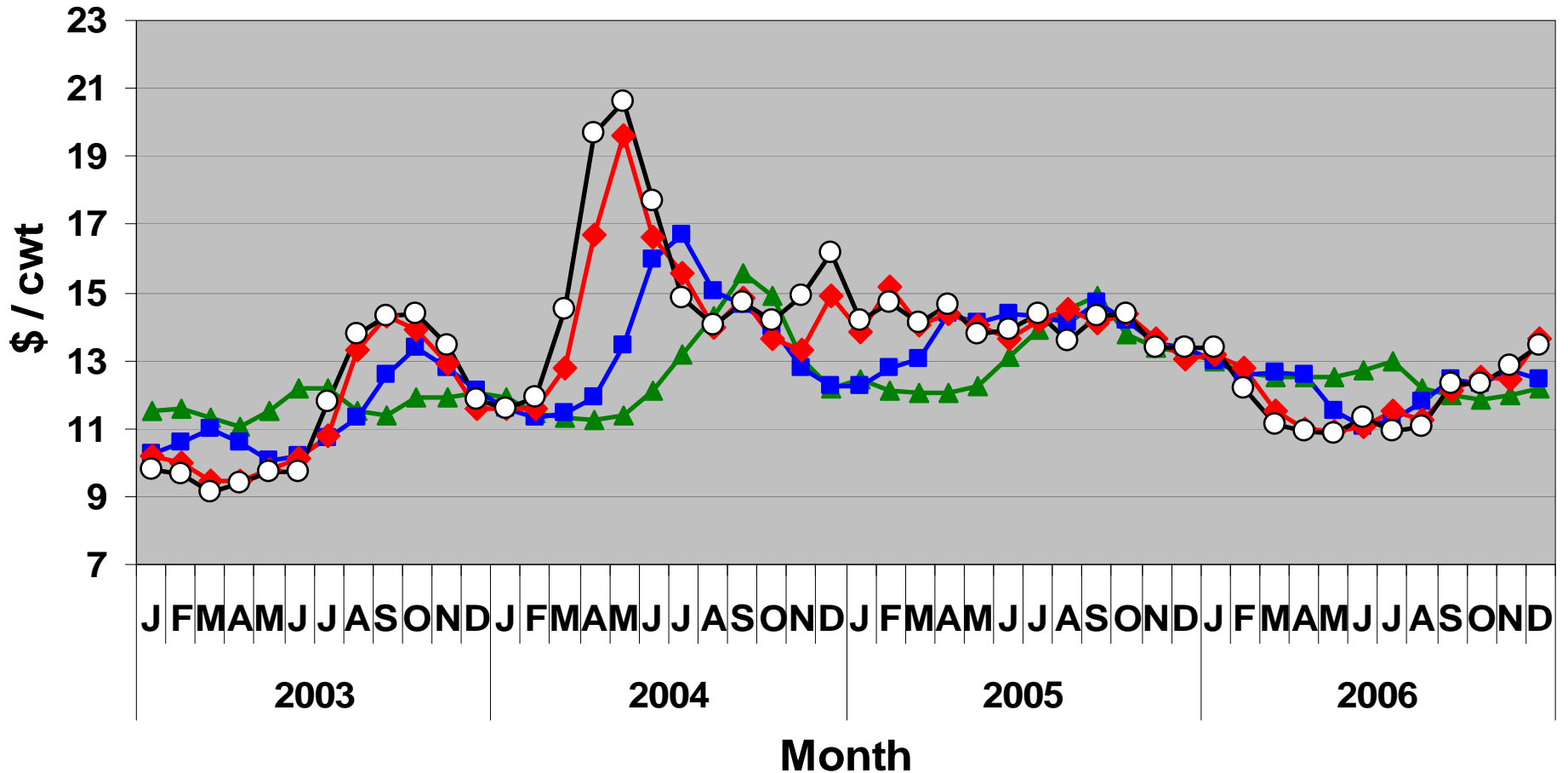


Data

- Period: Jan. 2003 to Dec. 2006 (48 months).
- CME: Closing prices of traded Class III and IV futures contracts (daily).
 - Averaged per month
- USDA: Class III and IV cash prices, butter prices, utilizations, uniform milk prices (all monthly).

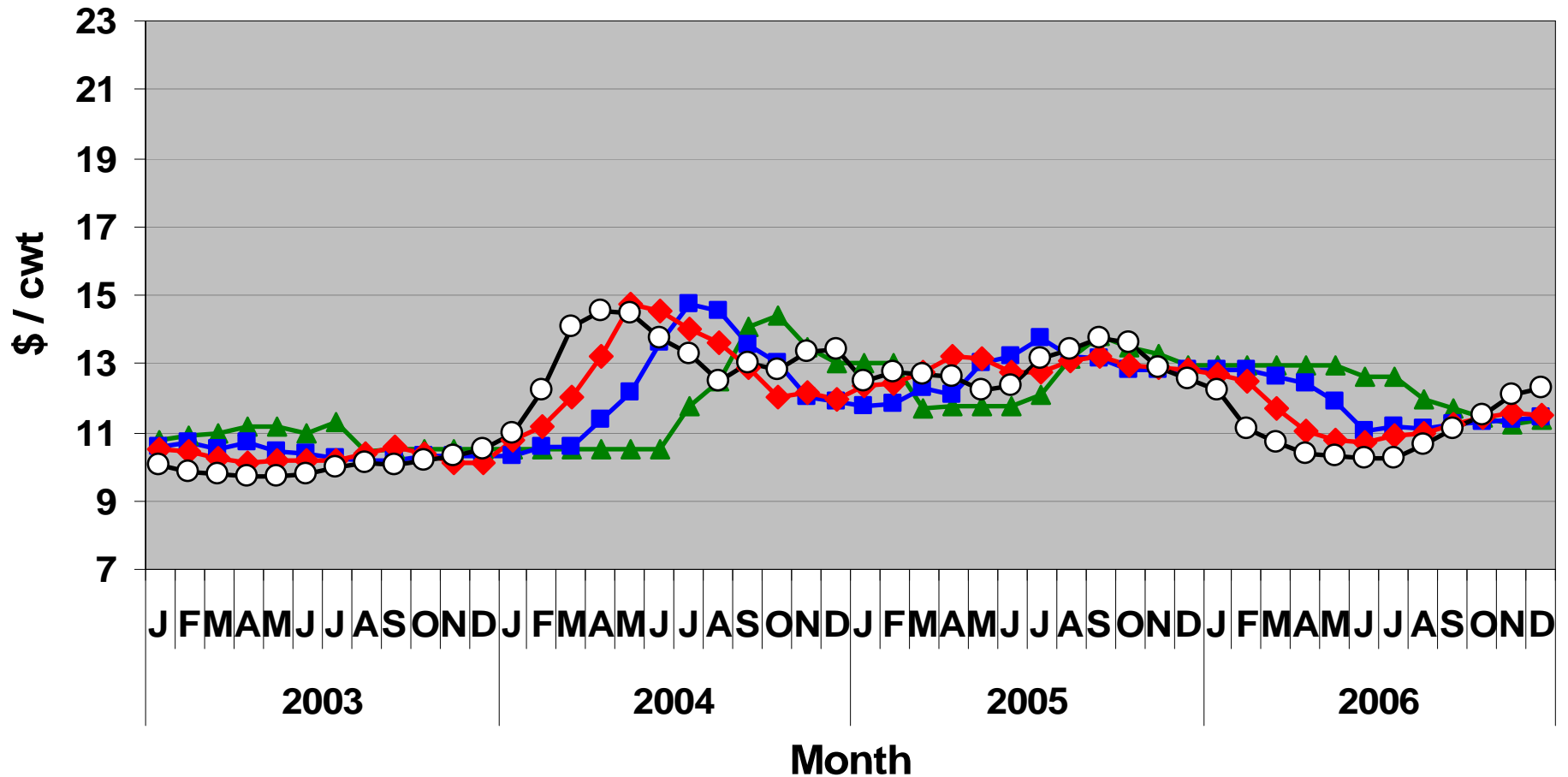
Class III, Predicted and Actual

▲ 6 mo ahead ■ 3 mo ahead ◆ 1 mo ahead ○ Actual



Class IV, Predicted and Actual

▲ 6 mo ahead ■ 3 mo ahead ◆ 1 mo ahead ○ Actual

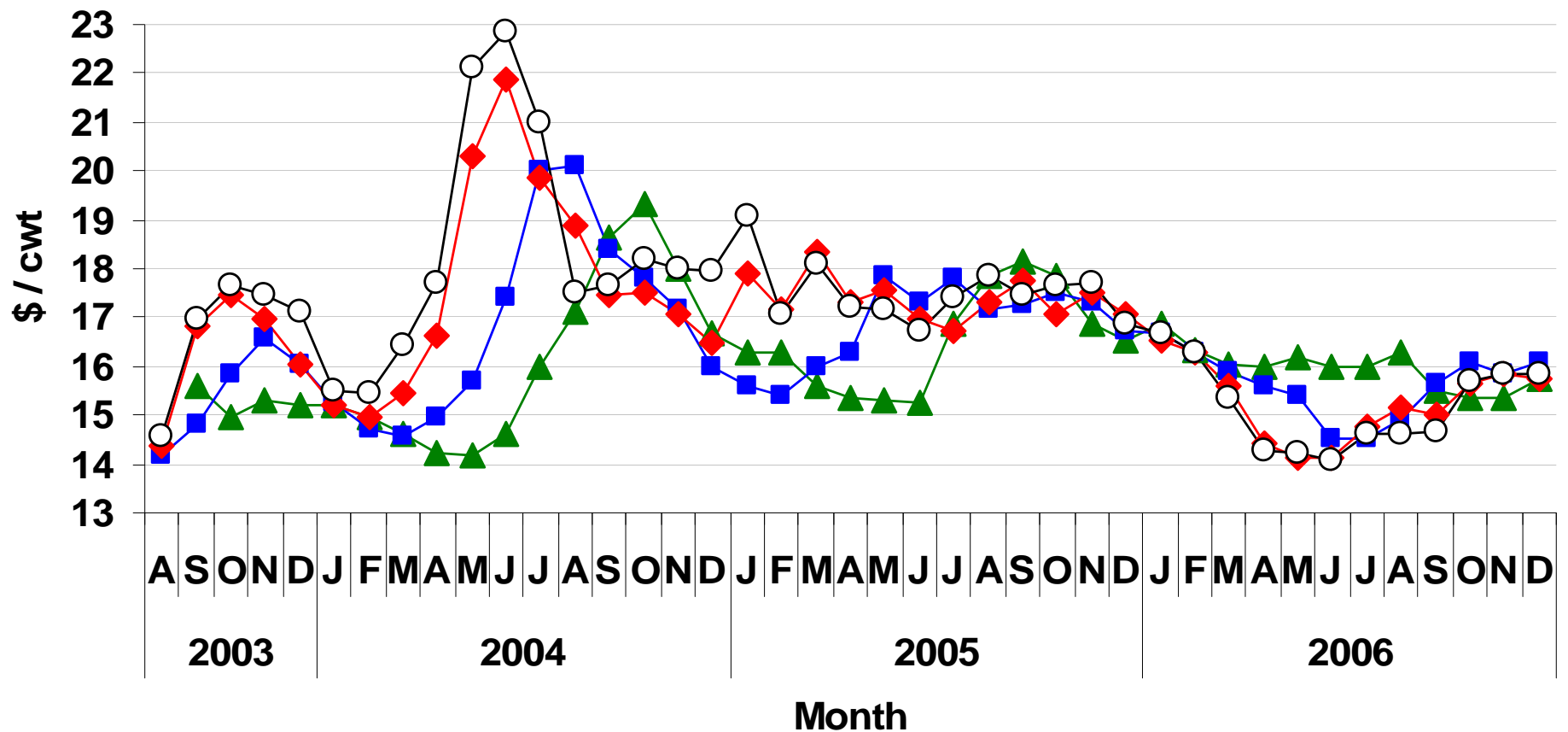


Prediction Method

- Class III and IV cash prices:
 - futures prices
- Announced butter prices, advanced butter prices, advanced Class III skim milk price, advanced Class IV skim milk price, advanced Class I butterfat price; function of:
 - futures Class IV price, last announced Class IV price, last announced Class III price, last announced butter price, last advanced butter price, advanced butter price
- Utilization skim milk, utilization butterfat:
 - Holt-Winters method (historical utilization)

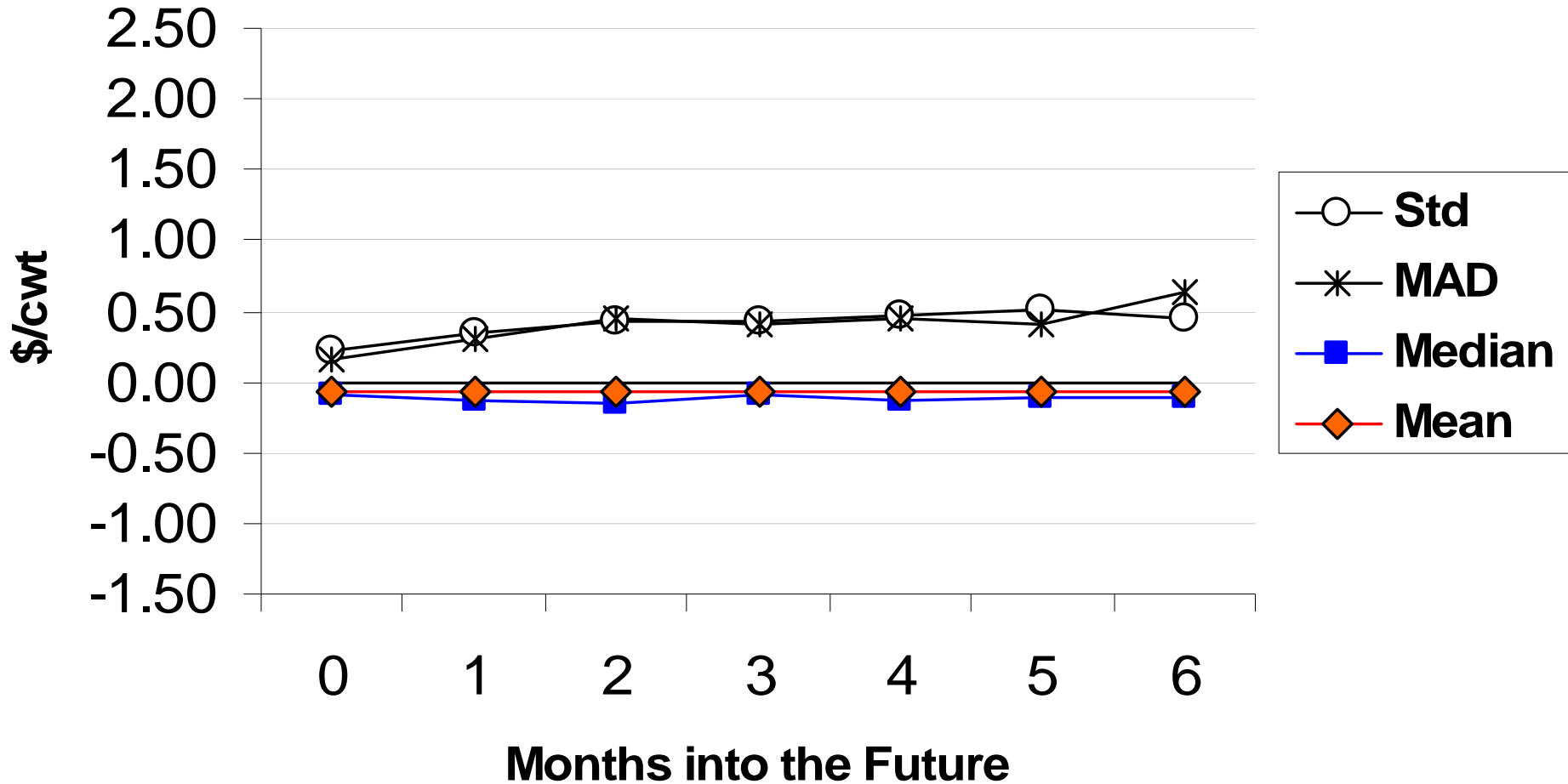
Uniform Prices: Predicted and Actual

▲ 6 mo ahead ■ 3 mo ahead ◆ 1 mo ahead ○ Actual



Tampa Uniform Price, Predicted - Actual, \$/cwt

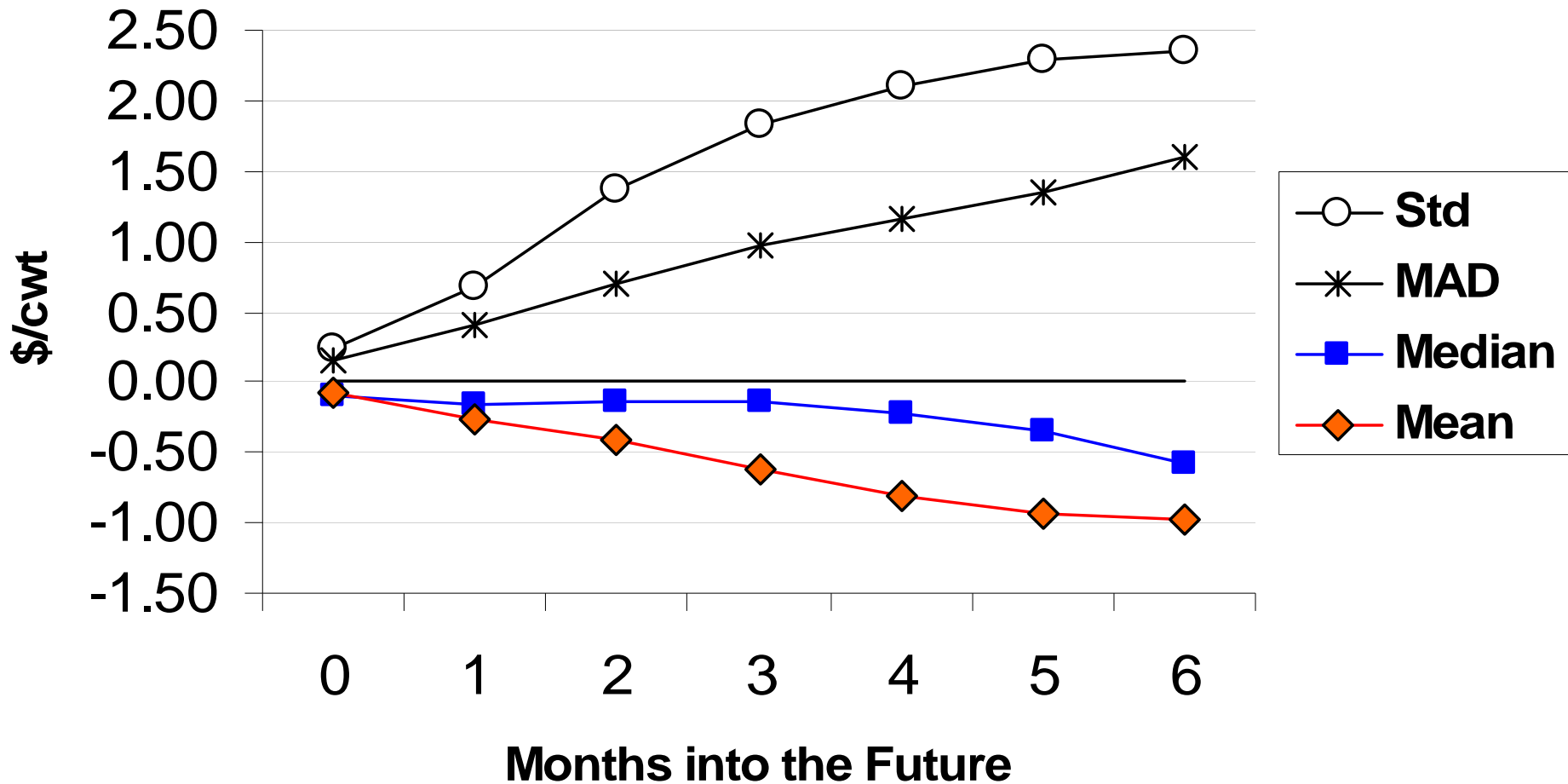
Butter prices and utilizations predicted; Class III and IV prices assumed known (2003-2006)



MAD = median absolute deviation: $1.482 \text{ median } |x_i - \tilde{x}|$

Tampa Uniform Price, Predicted - Actual, \$/cwt

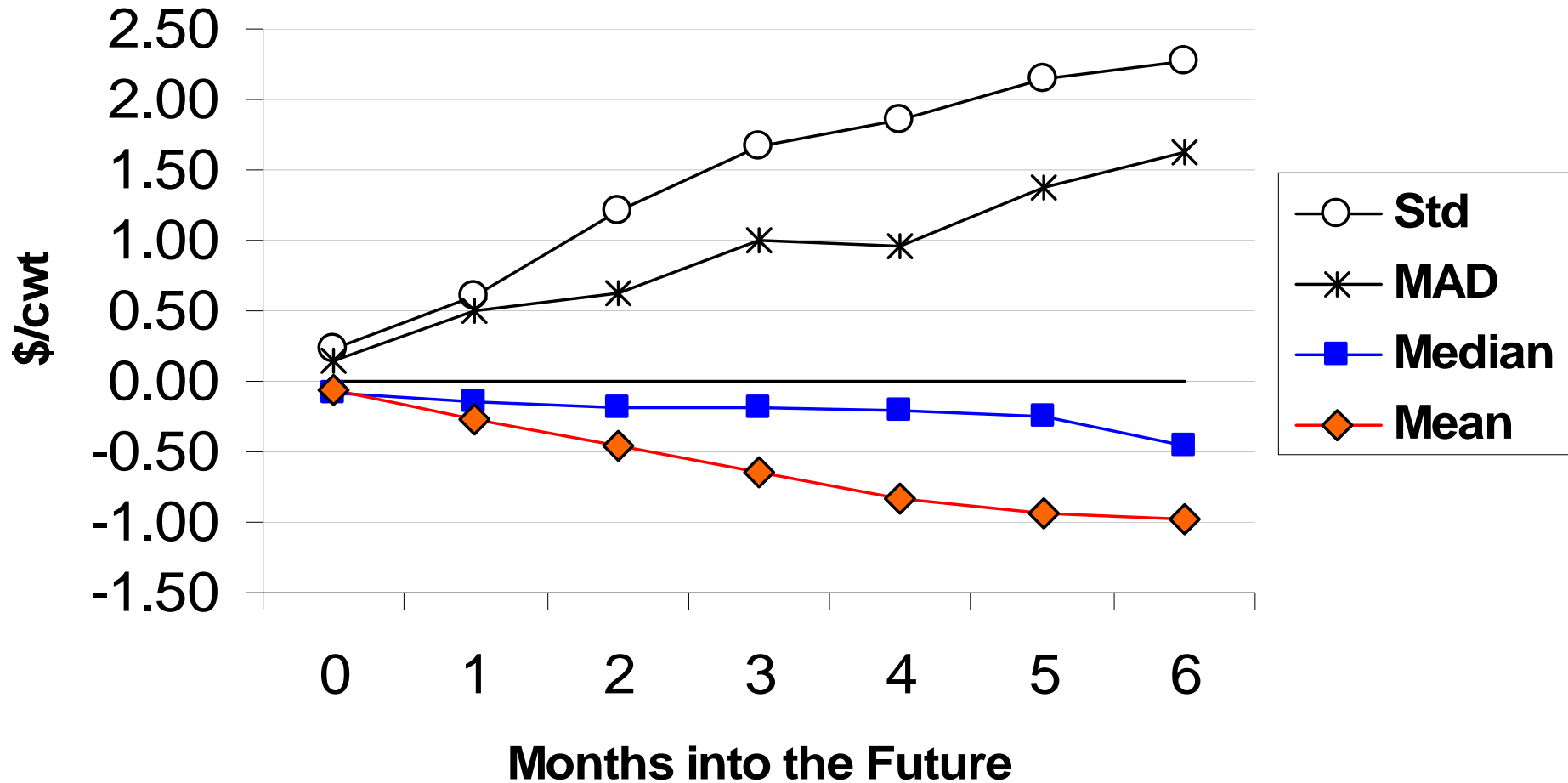
Class III and IV prices predicted; butter prices and utilizations assumed known (2003-2006)



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Tampa Uniform Price, Predicted - Actual, \$/cwt

Class III and IV prices, butter prices, utilizations predicted (2003-2006)



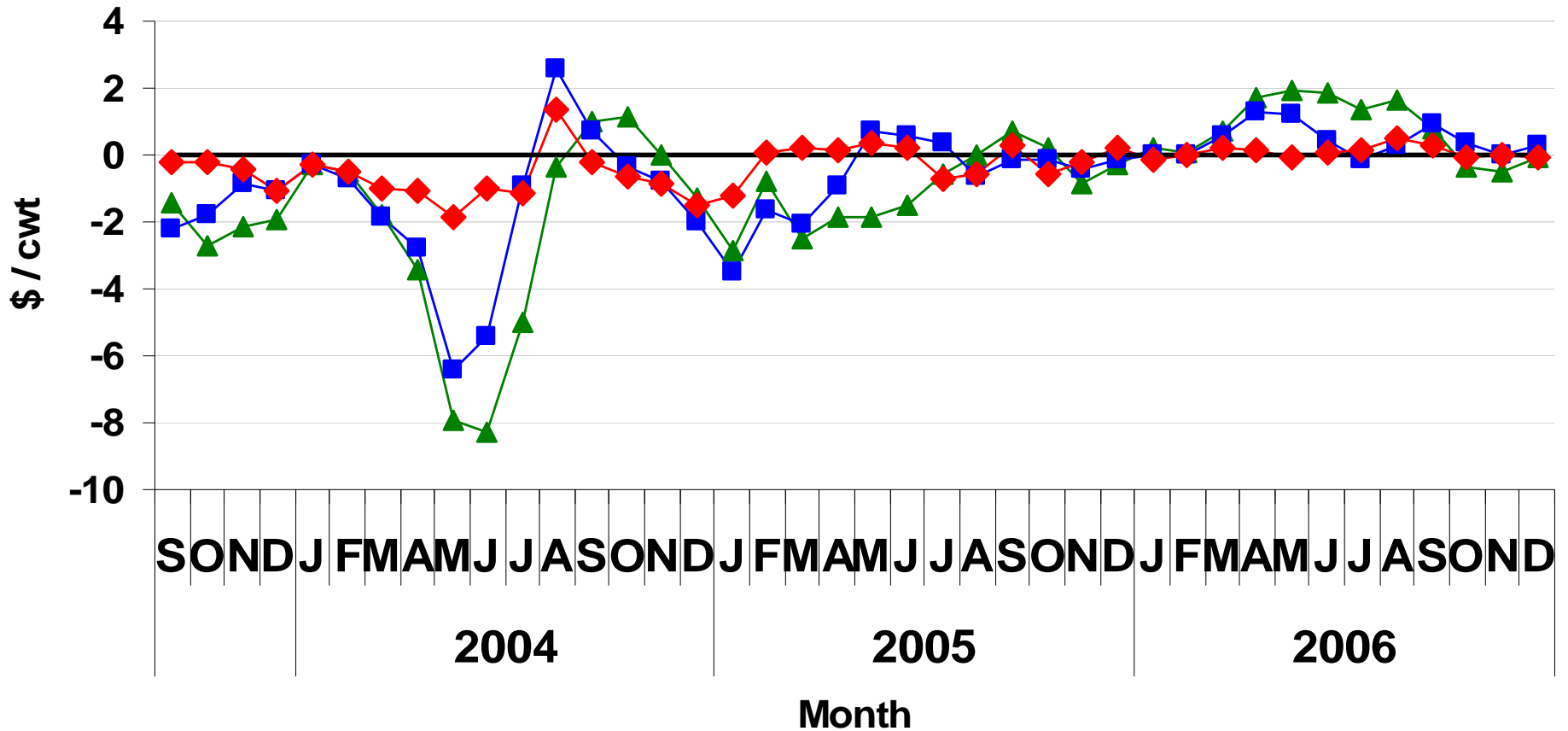
MAD = median absolute deviation: 1.482 median $|x_i - \tilde{x}|$

Uniform Prices: Prediction Errors

▲ 6 mo ahead

■ 3 mo ahead

◆ 1 mo ahead



Conclusions

- Predicted uniform prices are increasingly inaccurate farther into the future.
 - Uncertainty is large even a few months ahead
- Majority of prediction error due to inability of CME futures market to predict Class III and IV cash prices accurately.

Thank You



**Albert De Vries
devries@ufl.edu**

<http://www.animal.ufl.edu/devries>

