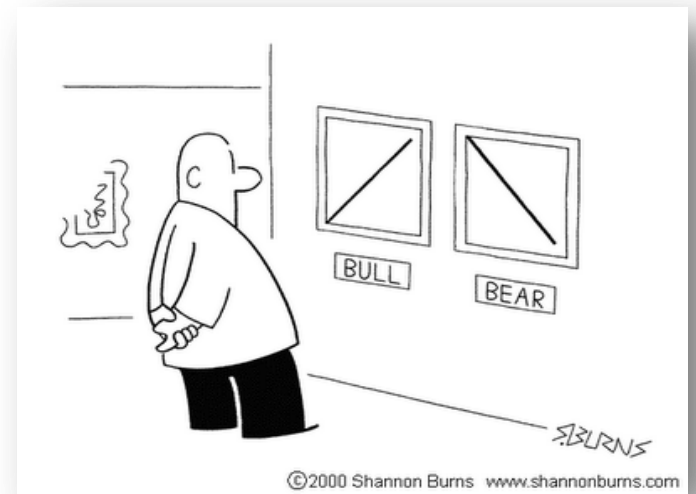


# PREDICTING CHANGES IN QUARTERLY CORPORATE EARNINGS USING ECONOMIC INDICATORS



group a 8

BDM term project | @ isb | december 28<sup>th</sup>, 2011

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# THE JOE ELLIS THEORY

BIDM CONTEXT:

1. Check Validity of theory
2. Can we build a model to predict changes in S&P EPS?

- **The 4 Stages of Economic Downturns:**
  1. **THE PEAK**
  2. **MODEST SLOWING**
  3. **INTENSIFYING WORRYING**
  4. **ADVENT OF RECESSION**
- **By the time a recession is OFFICIALLY announced, the damage has already been done! Economy is actually on an upturn, but investors are selling off and panicking because of the MEDIA HYPE!**
- **SO THEN THE KEY QUESTION ARISES: FROM AN INVESTOR'S PERSPECTIVE, CAN WE PREDICT THE SLOWDOWN IN CORPORATE EARNINGS WELL IN ADVANCE? IN OTHER WORDS → WHEN IS MY SELL SIGNAL? MY BUY SIGNAL?**
- **ELLIS SAYS: YES WE CAN!**
  1. **CHART INDICATORS ON A Y/Y% CHANGE BASIS. (Q VS Q AND M VS M IS TOO NOISY)**
  2. **IDENTIFY CAUSAL RELATIONSHIPS BETWEEN ECONOMIC INDICATORS**
  3. **HISTORICAL LEAD/LAG RELATIONSHIP EMERGES.**



# THE DATA

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## PROPERTIES

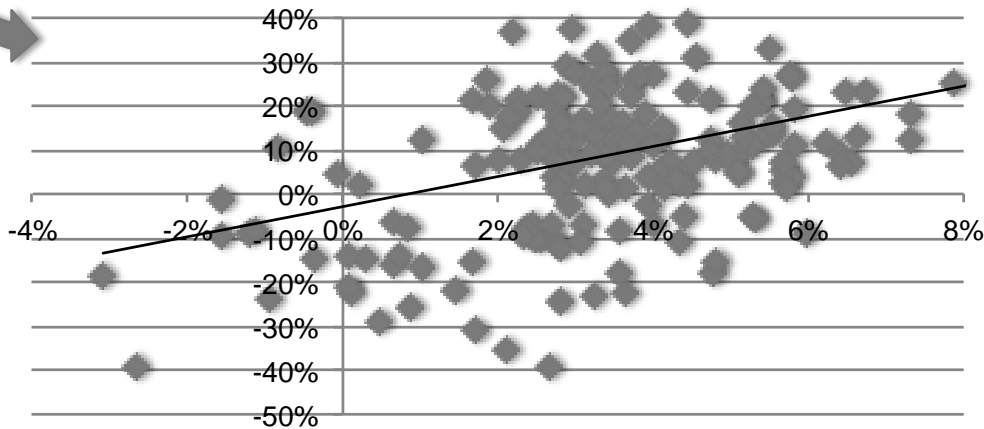
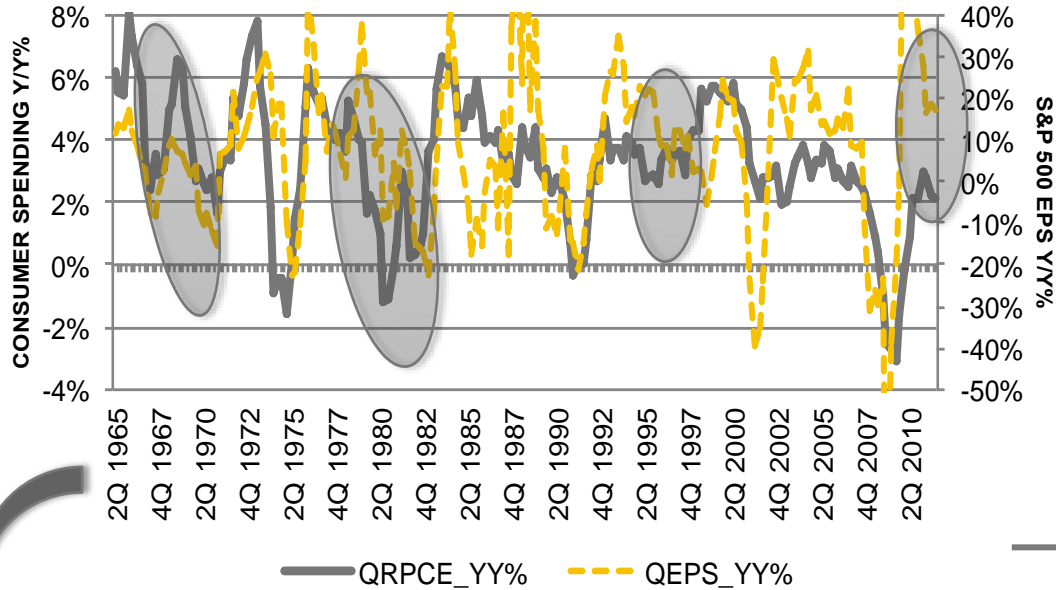
- 180 quarters. 6 [Economic]  $x$  variables.
- Change in S&P EPS =  $y$  variable.
- All variables transformed to year vs year % change
- All data used is publicly available via websites of US agencies: BEA, BLS, FED, and S&P

## ...& PROCESSING

- Missing Values = None. Cleaning = capped outlier percentages (2 instances)
- Ellis claims (based on observations) there is a 0-9 month lag between wages and its effect on consumer spending. 0-6 months until changes in consumer spending affects changes in industrial production. Another 6-12 months between industrial production and capital spending. And finally, another 6-12 between capital spending and its effects on Corporate Profits.
- **BUT INSTEAD** of blindly accepting the above claim, we **ALSO** turned to **VISUALIZATION** (see next slide). From these, we created various intervals while aligning our  $X$  variables with the lagged  $Y$  values. For example, consumer spending lags 2 quarters in one set, 1 quarter in another.
- We ran XLMiner on these different versions of datasets. Partitioned it. Ran predictor applications: ACF Plots, MLR, Regression Tree – full and pruned.

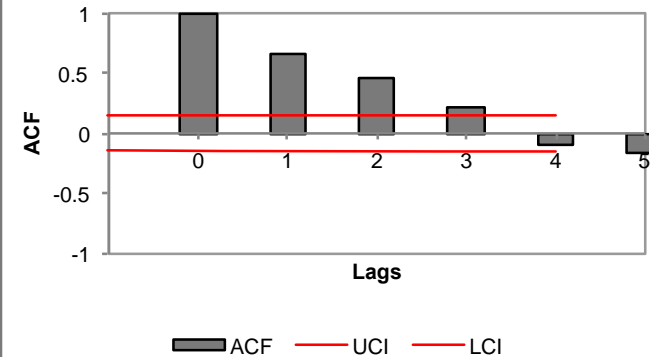


# EXPLORATION



**Auto Correlation Chart. Based on this, took Lag\_1 as one of the predictors. Lag\_1 =  $QEPS\_YY(Q-1)$**

**ACF Plot for QEPS\_YY%**



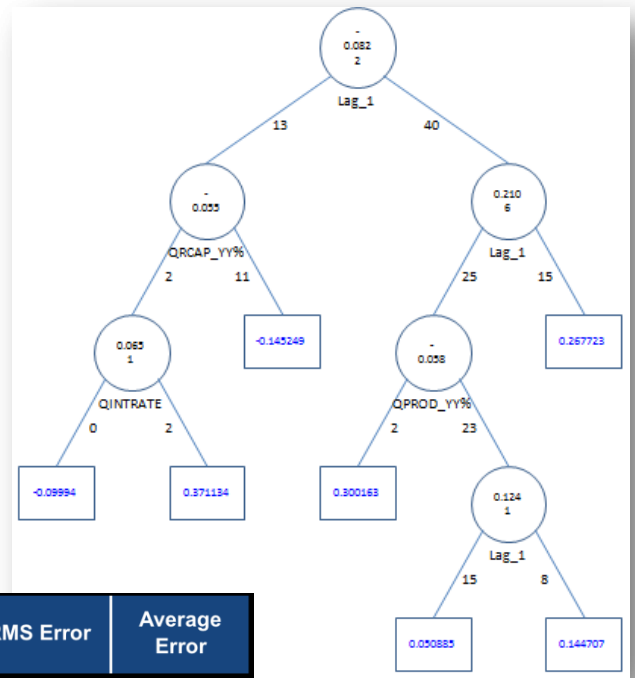
- **Scatter helped us see nature of relationship (in above case, positive, majority in top-right quadrant)**
- **Line charts allowed us to visualize lead / lag + causal relationships across various economic indicators, as well as versus S&P EPS (our Y)**

# THE MILLION \$\$ FORMULA



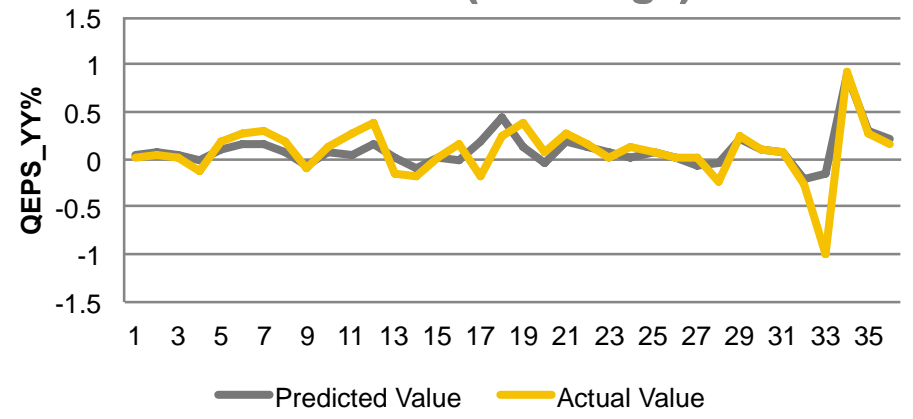
$$[ QEPS\_YY\%_{(t)} = 0.0486 + 0.747*QEPS\_YY\%_{(t-1)} - 0.517*QRCAP\_YY\%_{(t-2)}$$

We used regression trees to get our best indicator. We then tried Multi linear Regression with both the 'Best Subset' and the subset using the predictors as indicated by the pruned tree. Interestingly, we saw the 'parsimonious' selection of 2 variables was as good at predicting ( as indicated by RMSE values) and visualization.

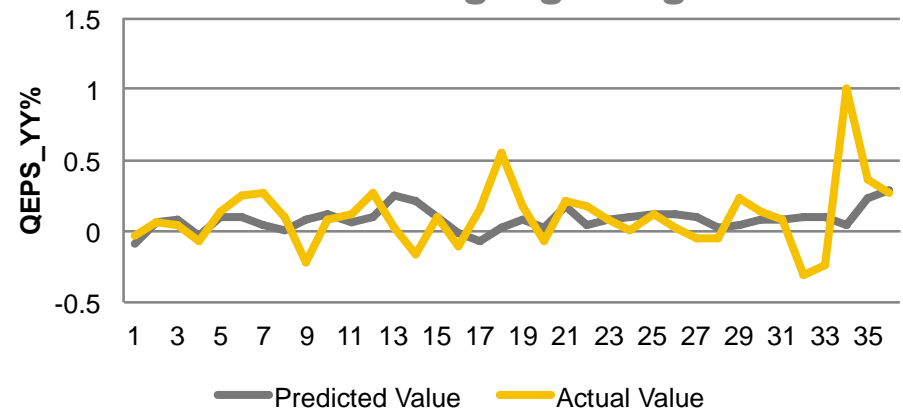


Total sum of squared errors	RMS Error	Average Error
1.2947012	0.1896416	-0.0131939

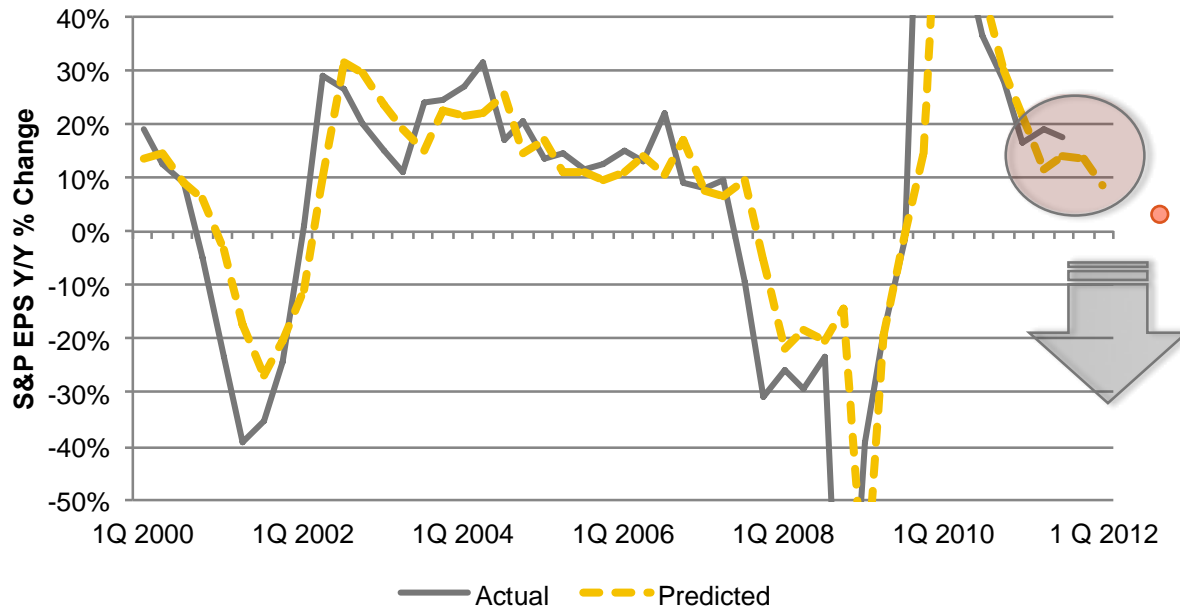
Predicted Vs Actual : Prune Tree Vars ( with lags)



Predicted Vs Actual: Without considering lag using MLR

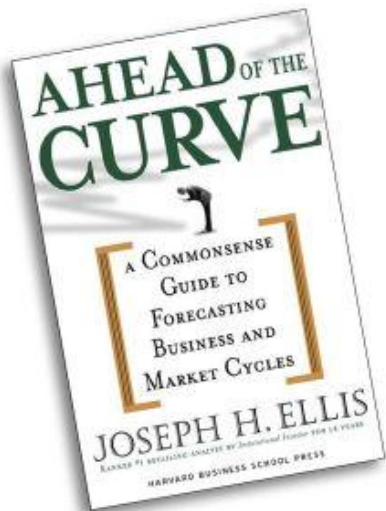


# CONCLUSION: APPLYING THE MODEL



Predicted EPS slowing down as we head into 2012

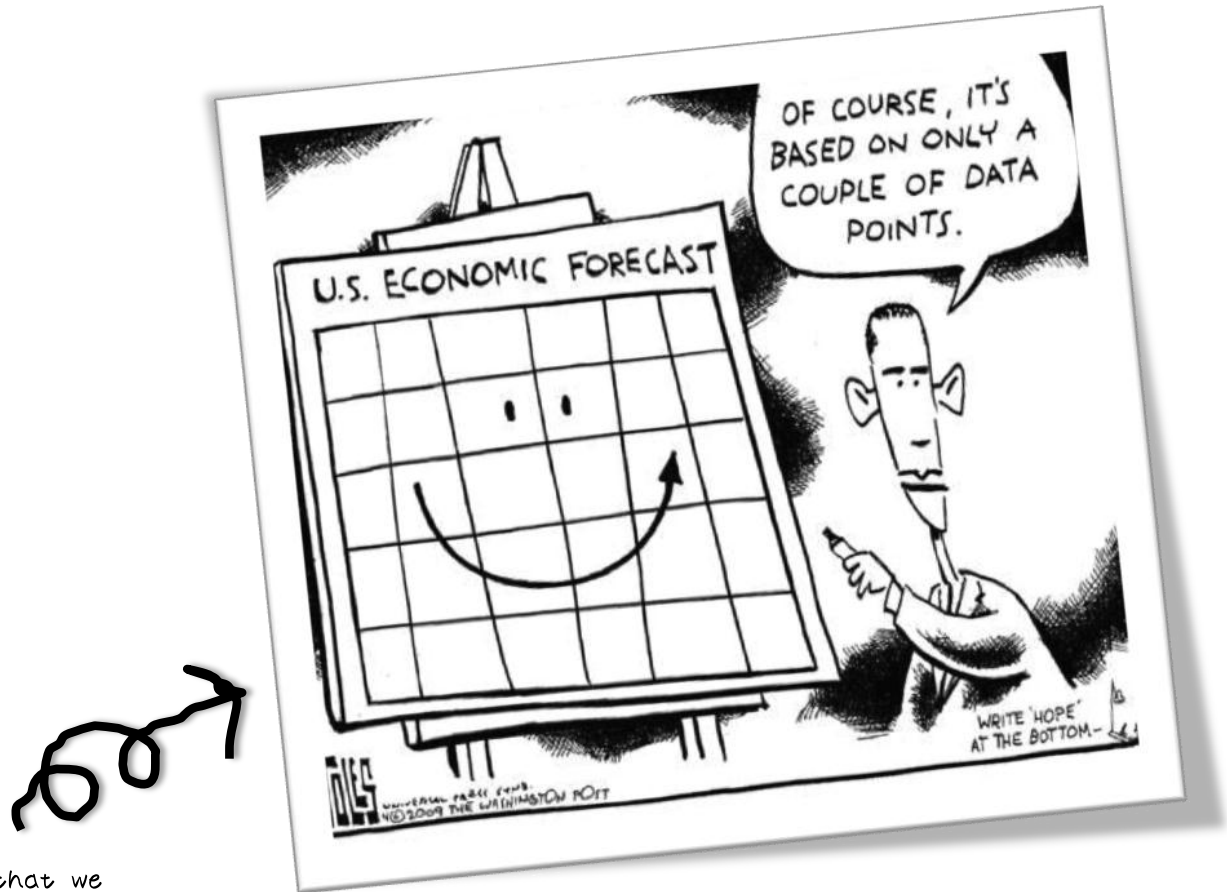
In line with Ellis' comment! **HOWEVER**, predictive capacity is limited because we can only forecast one quarter ahead based on actuals! (Unless we use consensus estimates on S&P EPS and / Cap Spend ]



## Current Ellis Comment

Slowing real-wage growth... indicates that Y/Y growth in real consumer spending will deteriorate over the next 1-2 years. This suggests that corporate-profit (S&P 500) earnings growth will also suffer, and raises a strong possibility that the stock market may be headed for another decline. *October 14<sup>th</sup>, 2011*

# QUESTIONS?



[ disclosure: all this. . .that we just talked about. . .take it with a grain of salt. . .]