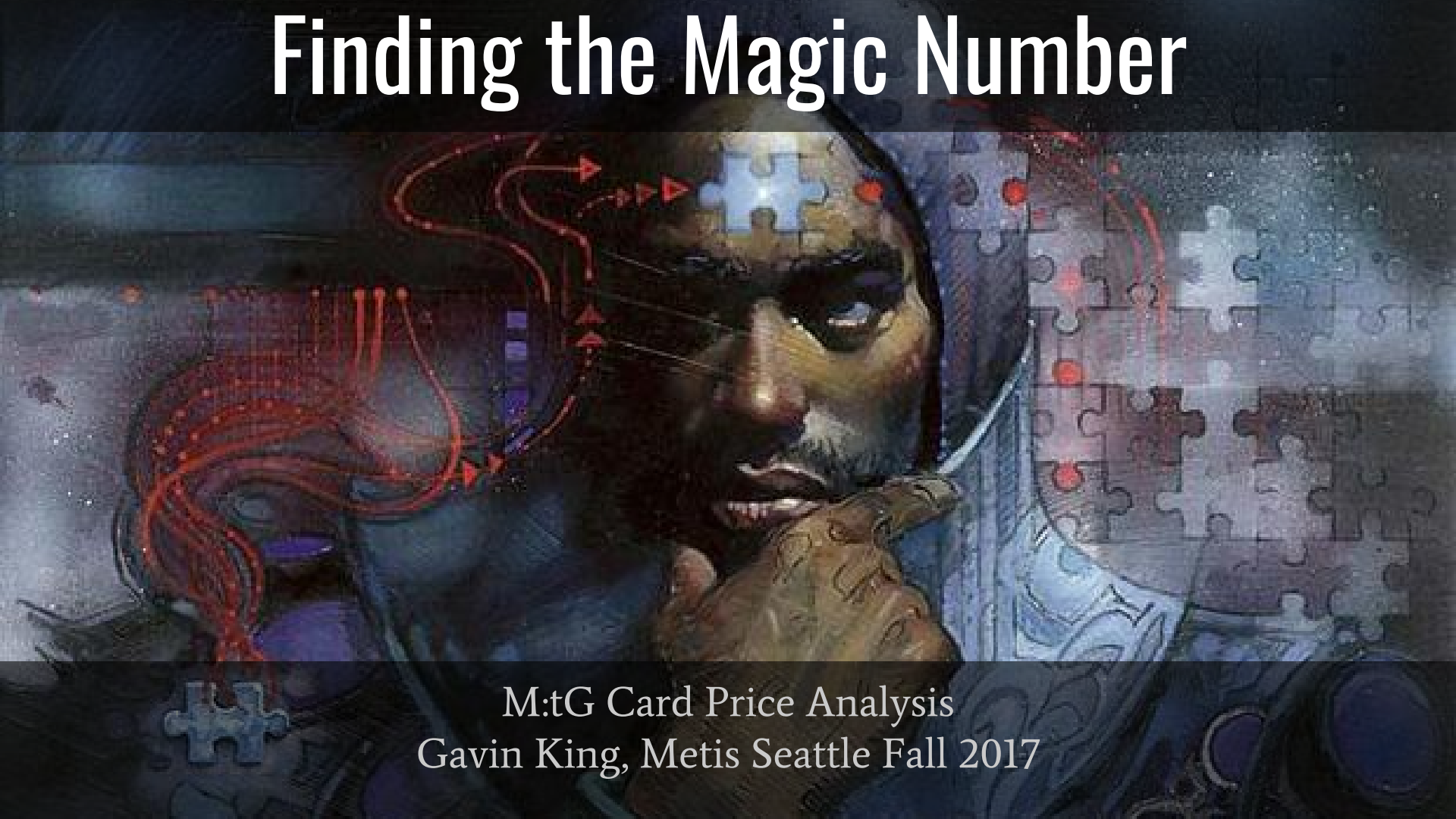
Finding the Magic Number



M:tG Card Price Analysis

Gavin King, Metis Seattle Fall 2017

Why Magic?

- Oldest and most popular TCG
- Primary market $200M/year
- Secondary market...?
- Old/rare caps at $4000
- Cost mostly based on play value

Anatomy of a Magic Card

Converted Mana Cost (5)

Keywords

Word Count

Set/ Rarity

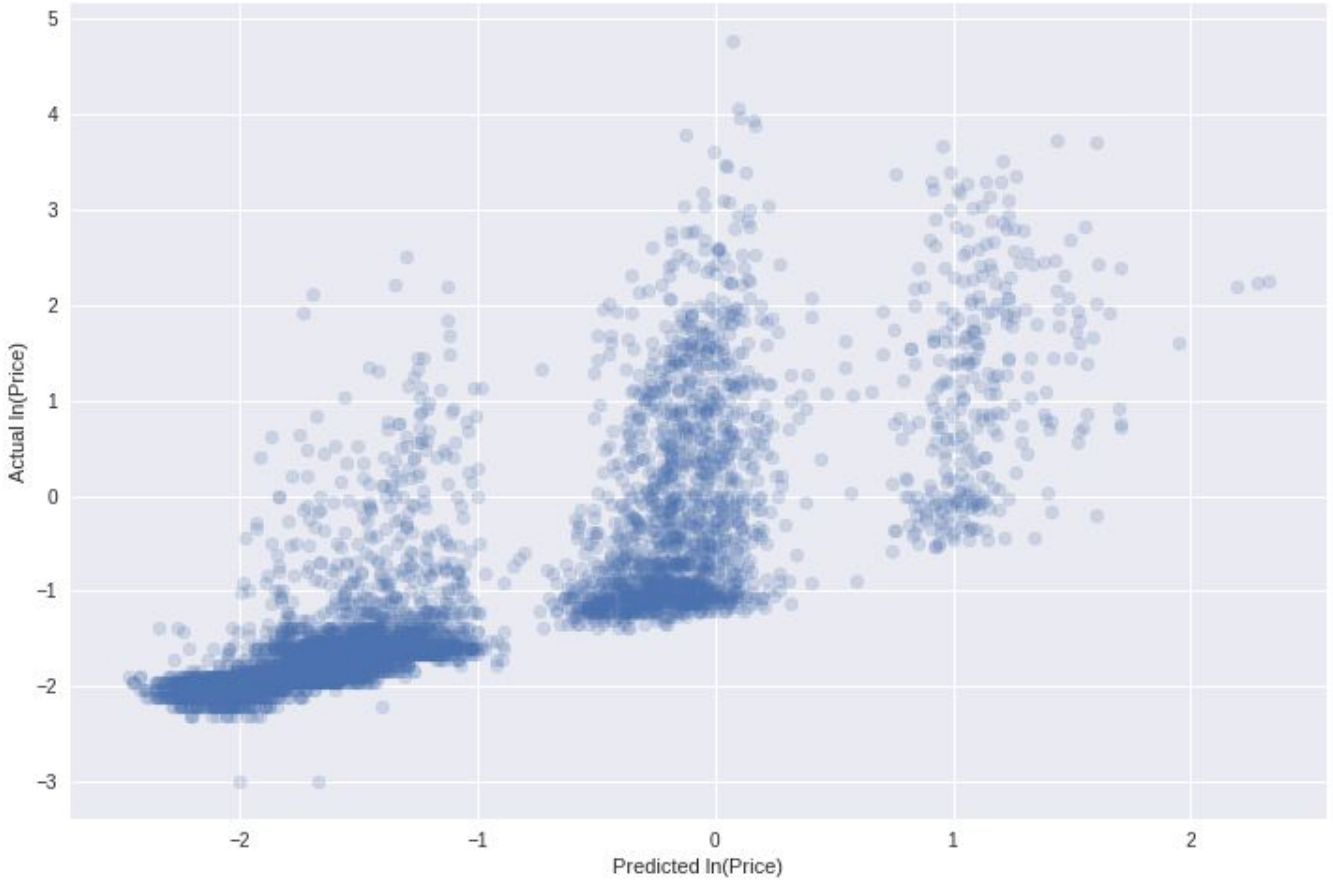
Power/ Toughness

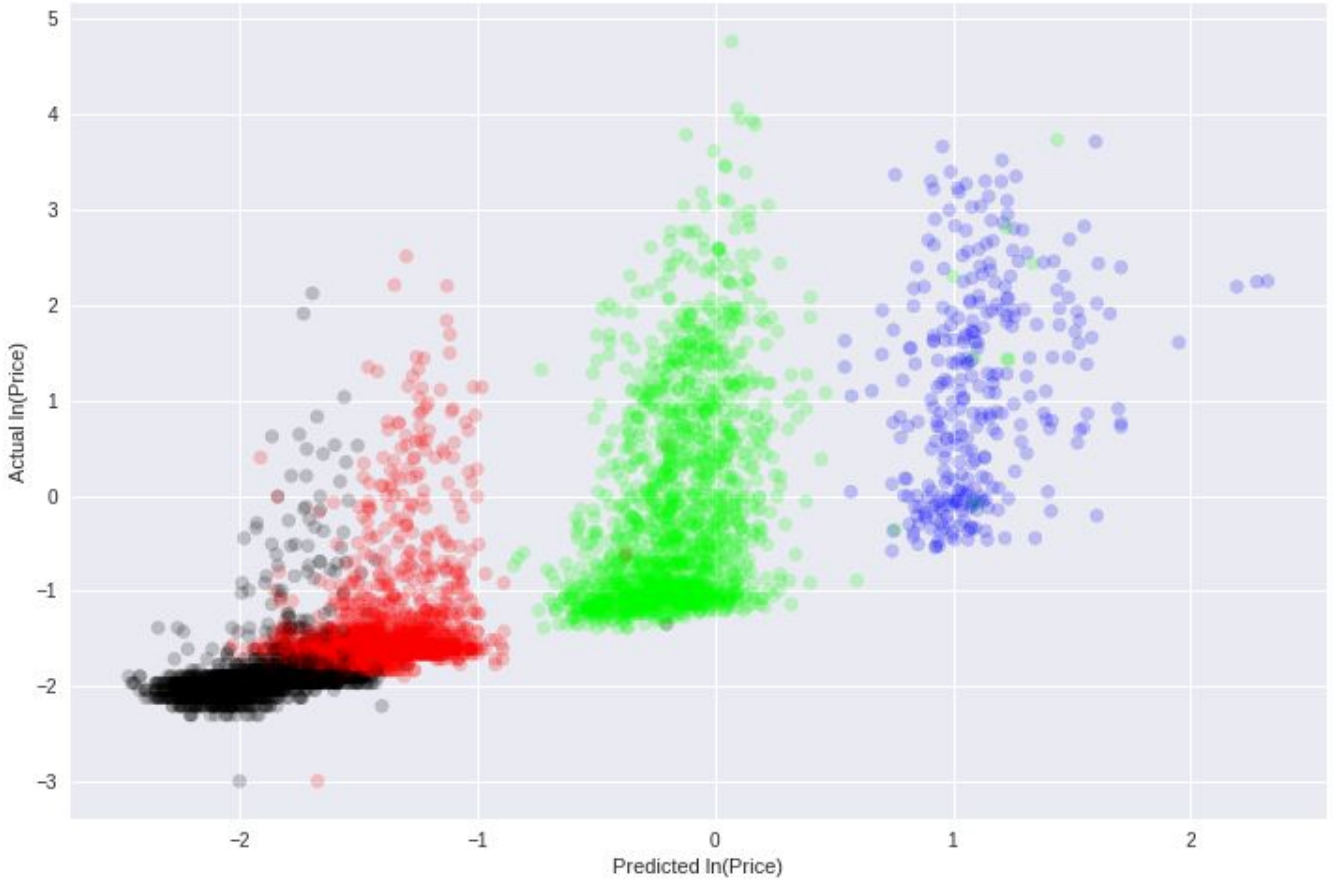
Data Collection

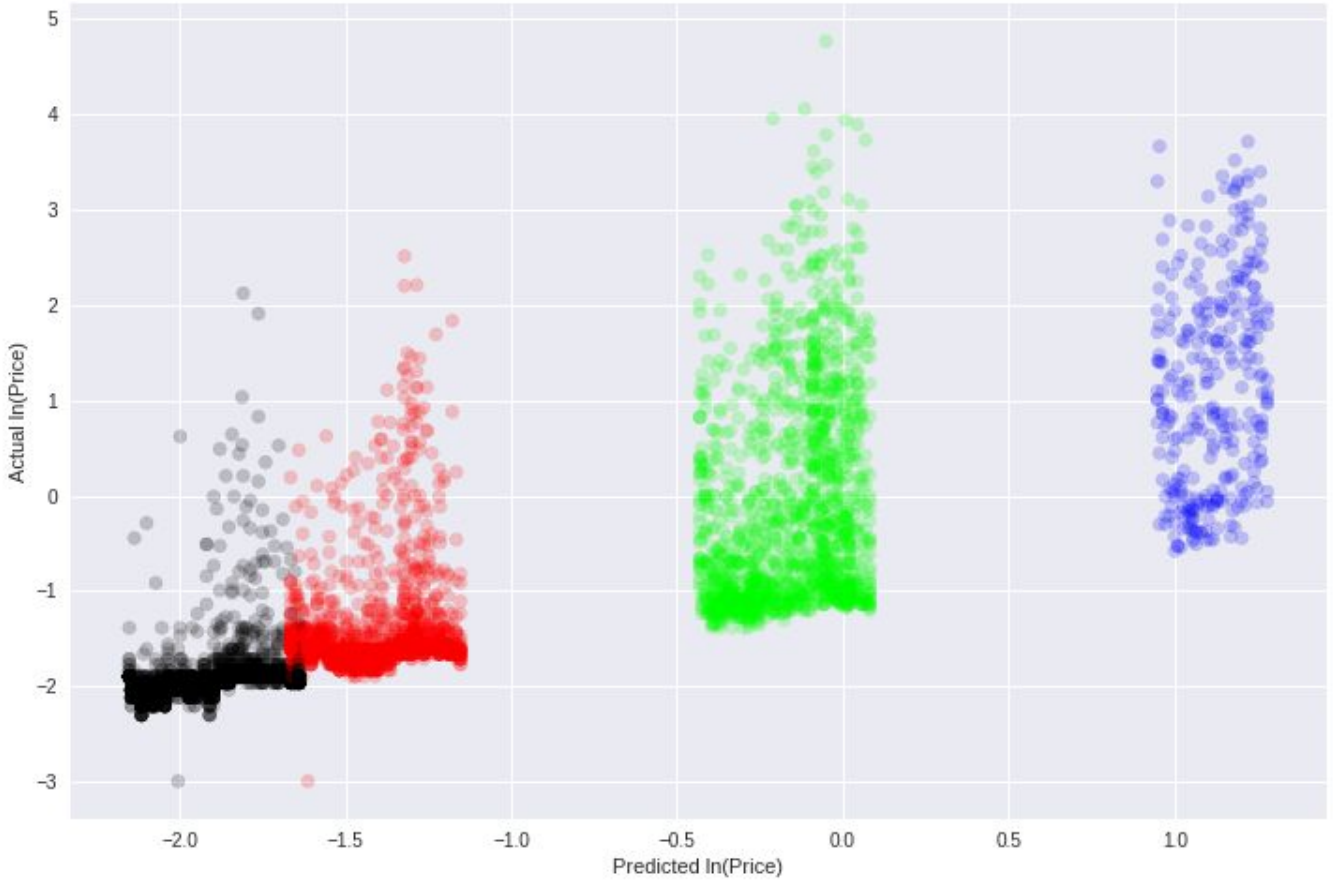
- Magiccards.info (with prices from TCGPlayer.com)
- Every creature card in the Modern format (i.e. since September 2003)
- 6,432 cards
- Scraped using BeautifulSoup and Selenium

Data Analysis

- Started with simple linear regression
- Refined into Ridge regression with cross-validation
- Plotting errors told an unexpected story


5
4
3
2
1
0
−1
−2
−3
Actual ln(Price)
−2
−1
0
1
2
Predicted ln(Price)


Actual ln(Price)
Predicted ln(Price)
5
4
3
2
1
0
−1
−2
−3
−2
−1
0
1
2


Actual ln(Price)
Predicted ln(Price)
5
4
3
2
1
0
−1
−2
−3
−2.0
−1.5
−1.0
−0.5
0.0
0.5
1.0

The Model

- Common: $0.11
- Uncommon: $0.18
- Rare: $0.64
- Mythic Rare: $2.58
- Add 3.75% per year of age
- MSE: $2.41

Future Work

- This dataset is probably exhausted
- Can advanced NLP read card text and predict prices?
- What's actually done -- look at tournament performance results

Thank you for listening!

Any questions?