Market Segmentation for Fashion Retailers
Validating Trend Adoption Strategies

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Capstone Project ID 57

TRENDALYTICS

Problem Statement

- Understand fashion retailer behaviors as they relate to trend adoption
- Develop methodology to segment retailers based on their trend response time and inventory stocking aggression

Data

- Google Search Data of trending terms searched online
- Retailer Inventory Data of inventory stock per trend (in weeks)

| Market Index	Retail Site	Retailer ID	Crawled?	ret_id	trend	3/25/18	4/1/18	4/8/18
Fast Fashion Index	Forever 21	36	Crawler	36	high%20wais	36	36	36
Fast Fashion Index	Boohoo	1745	Crawler	1745	neon	45	19	19
Fast Fashion Index	Boohoo	1745	Crawler	1745	paper%20ba	22	17	17
Fast Fashion Index	Boohoo	1745	Crawler	1745	high%20wais	96	86	86
Fast Fashion Index	Topshop	483	Crawler	483	neon	4	4	3
Fast Fashion Index	Topshop	483	Crawler	483	paper%20ba	13	13	9
Fast Fashion Index	Topshop	483	Crawler	483	high%20wais	78	72	54

Defining "Trending"

- We define **t0** as the time when a trend becomes "trending"
- t0 calculated via momentum signaling:
  - Max difference between 12 week and 3 week moving averages → date when trend peaks
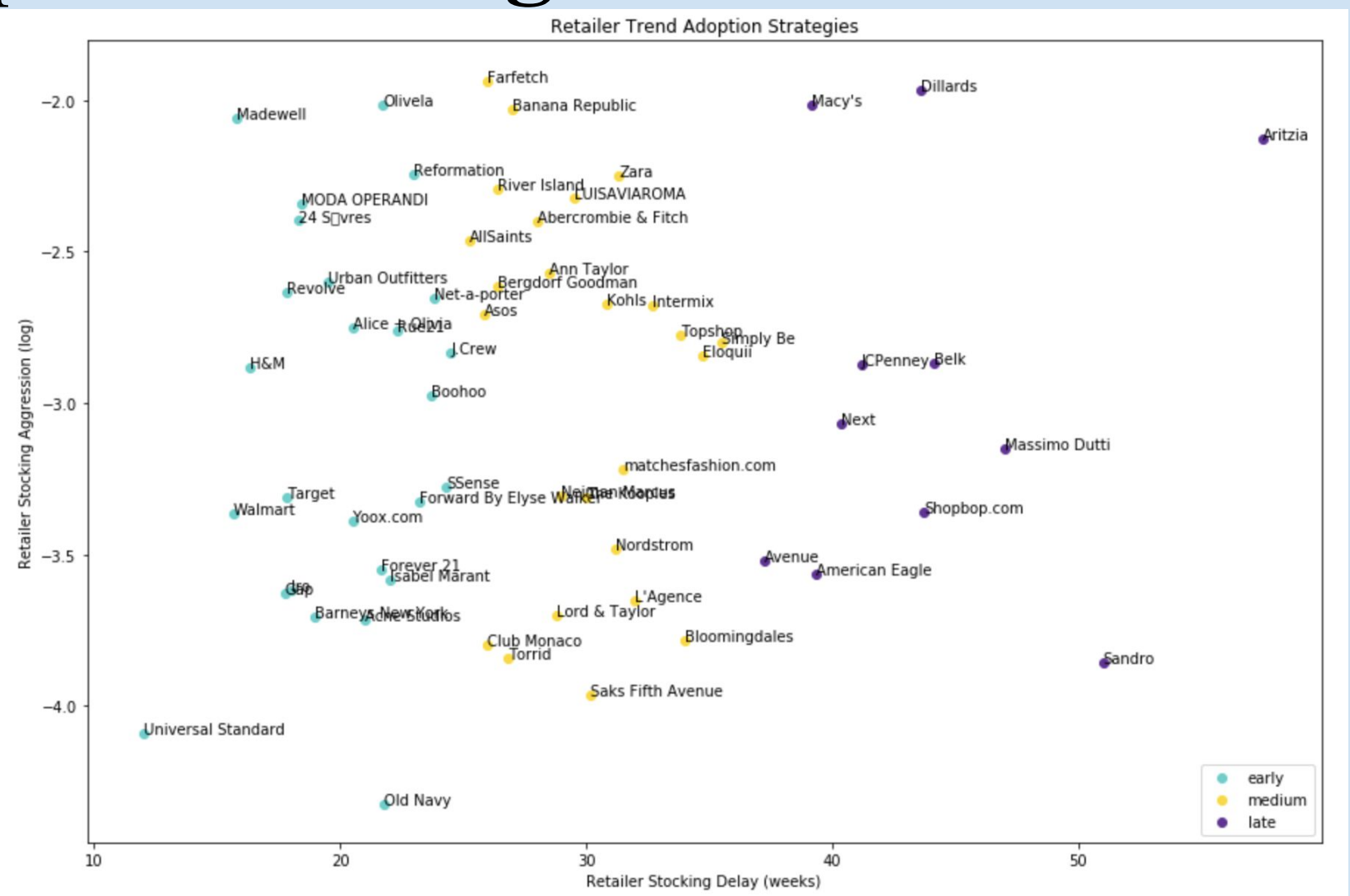 - Backtrack to find t0 as the closest local minimum at least 8 weeks prior to peak trend date
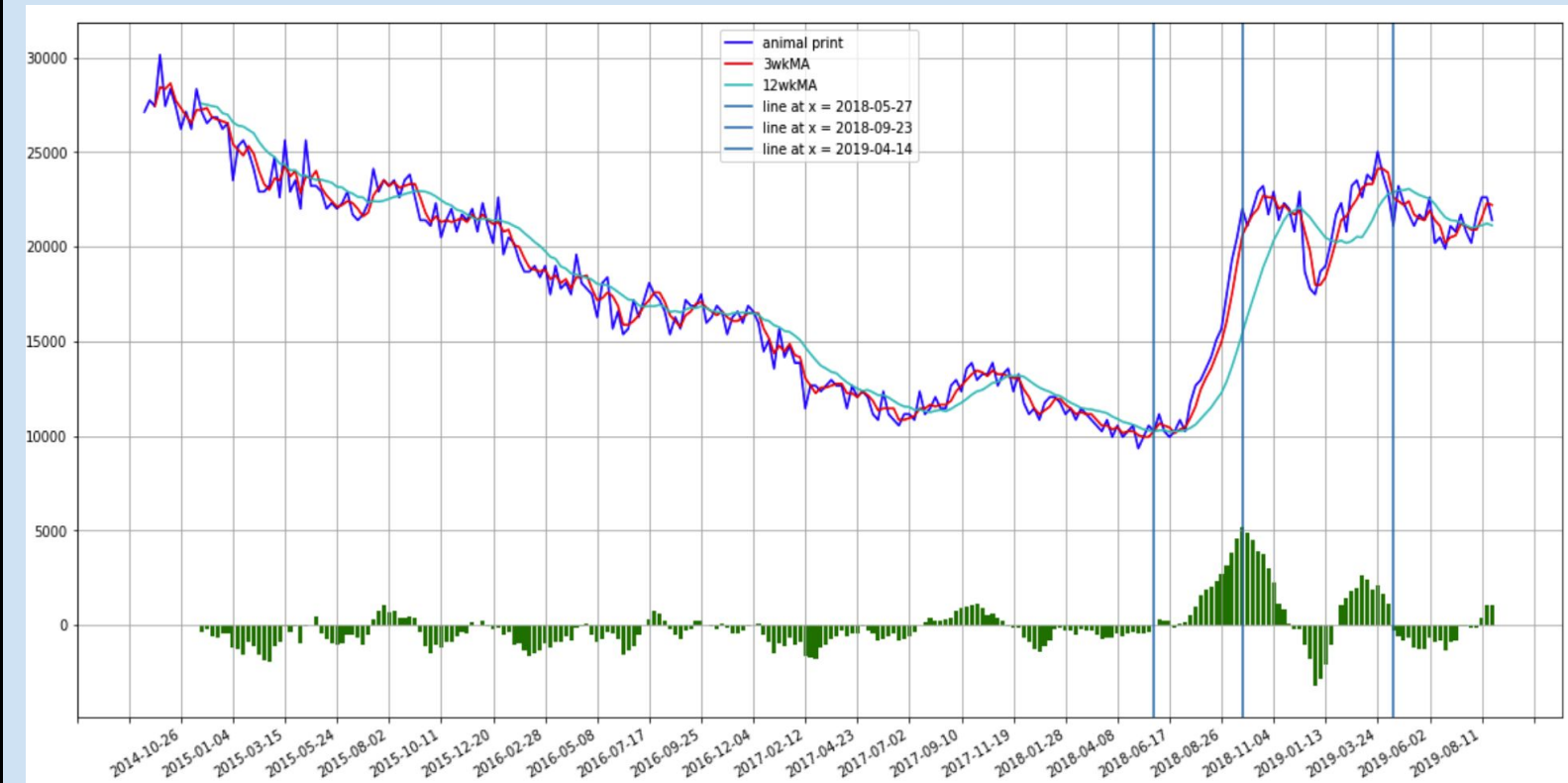
Visualizing Retailer Behavior

- We engineer two features to quantify retailer's response to a trend:
  - **Retailer Stocking Delay**: the number of weeks between a trend's t0 date and a retailer's t0 date
  - **Retailer Stocking Aggression**: the (log) difference between the maximum slope of a trend for a retailer and the maximum slope of the trend itself
- Retailer is farther right → slower response to "catch on" to trend
- Retailer farther up → rate at which a retailer stocks trend parallels the trend's demand
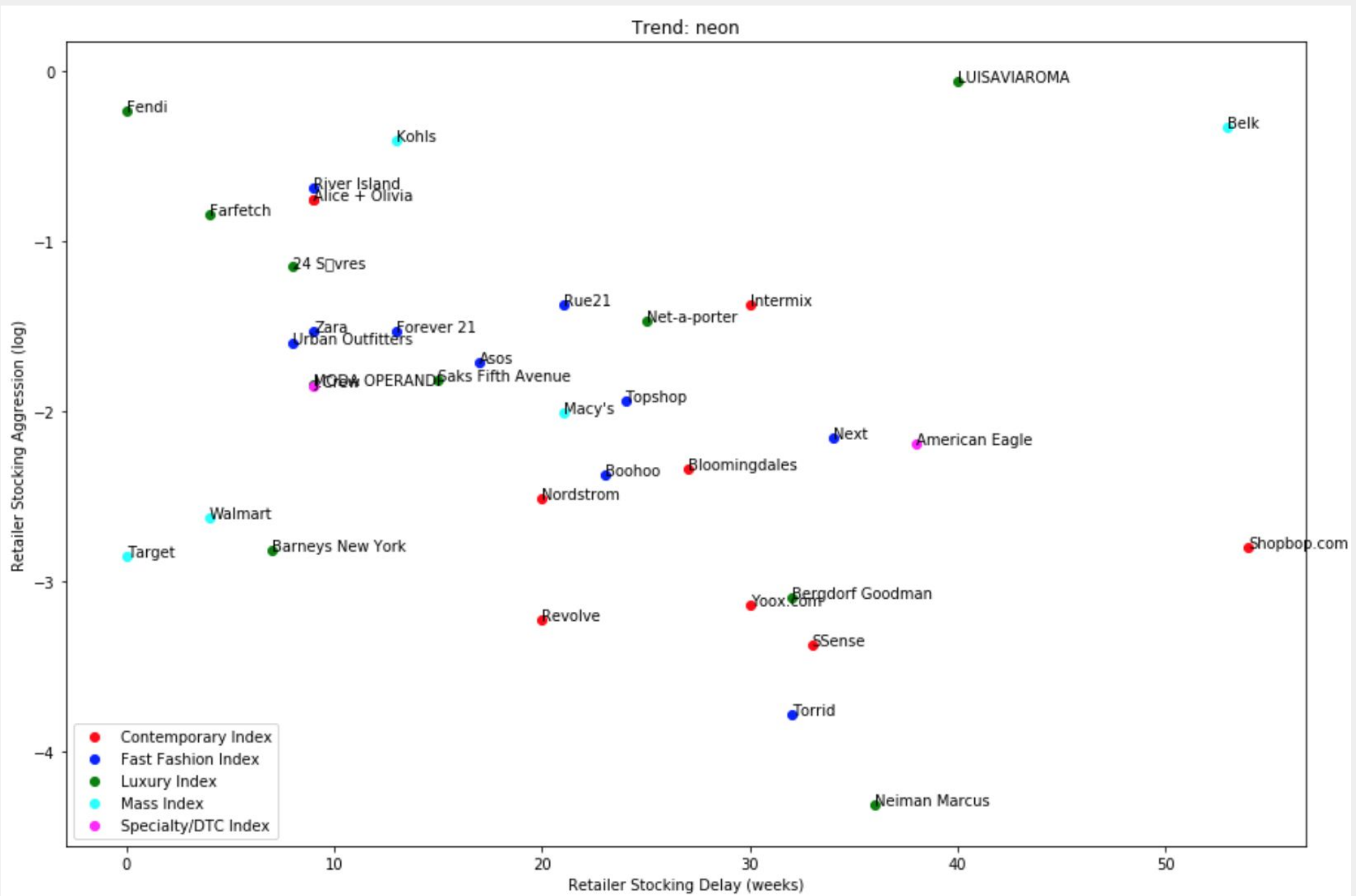
Retailer Trend Adoption Strategies

- Stocking delay and stocking aggression features are averaged across all selected trends per retailer
- KMeans Clustering used to assign trend adoption labels (early, medium, late) to retailers according to their averaged locations within the feature space
- Faster adopters cluster to the left and slower adopters cluster to the right

Results: Market Score Card

- Provides a digestible and consolidated report of trend adoption strategies
- Allows for quick comparison across retailers to analyze competitor behaviors
- Displays which trends retailers did not follow

Fast Fashion Index	neon	paper bag waist	high waisted jeans	animal print	open shoulder	puff sleeve	black cargo pants	aggregate
Asos	early	medium	early	early	early	medium	medium	medium
Boohoo	medium	early	medium	early	early	late	early	early
Eloquii	X	X	X	early	medium	late	late	medium
Forever 21	early	X	early	early	medium	medium	medium	early
H&M	X	early	early	early	early	medium	early	early
Next	medium	X	medium	medium	medium	late	late	late
River Island	early	medium	medium	early	medium	medium	medium	medium
Rue21	early	X	early	early	early	medium	early	early
Simply Be	X	X	X	medium	early	medium	medium	medium
Topshop	medium	medium	late	early	early	medium	medium	medium
Torrid	medium	X	X	medium	early	medium	medium	medium
Urban Outfitters	early	X	early	early	early	medium	late	early
Zara	early	X	early	early	early	medium	late	medium

Conclusions

- Data is telling - the original Market Index labels are not all indicative of retailers' behaviors
- Only 38% of Fast Fashion retailers were early adopters, 54% of them were medium, and 8% were late. Similarly, 30% of Mass Index are actually early adopters, while only 50% are late adopters
- Understanding trend taking action is a highly complex problem that requires the transformation of multiple data sources
- We demonstrated here that it is possible to construct and map retailers to a feature space that is also explainable to business users

Limitations

- No established "ground truth retailer" to use as a benchmark for typical trend adoption behaviors for each segment
- Extremely noisy trend search and ecommerce data

Future Work

- Extend segmentation to incorporate inventory pricing
- Develop new features such as trend type to include cyclical and declining trends