



IBM APPLIED DATA SCIENCE CAPSTONE PROJECT

THE BATTLE OF NEIGHBORHOODS

BY

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PROBLEM STATEMENT

- A BIG CORPORATE HOUSE WANTS TO DIVERSIFY ITS BUSINESS
- CURRENTLY RUNNING A SUCCESSFUL MULTIBRAND APPAREL RETAIL BUSINESS
- REVENUES AFFECTED BY PANDEMIC
- DECIDED TO SET UP RETAIL CENTRES FOR VEGETABLES AND FRUITS
- APPROACHED OUR TEAM FOR FUTURE MARKET STRATEGY AND BUSINESS SCOPE

INITIAL INPUTS

- RETAIL BUSINESS IS RISKY
- FOCUS ON B2B CONSUMERS
- SET UP A DISTRIBUTION CENTER IN ONE OF THE FOLLOWING THREE CITIES



Cities to be studies

- Toronto
- New York
- Paris



PRIORITY CUSTOMERS (IN GIVEN ORDER)

- RESTAURANTS
- HOTELS/MOTELS
- FAST FOOD OUTLETS
- BARS AND PUBS
- MALLS - RETAIL STORES OR SUPERMARKETS



DATA SOURCES

1. City location Data:

- Toronto – **Wikipedia data** on the postal codes and neighbourhoods in Toronto.
- New York – **Json file from 'https://cocl.us/new_york_dataset'** which consists location data related to the neighbourhoods.
- Paris – **Location data** for the administration zones of Paris which was sourced from www.aggdata.com

2. **Foresquare API** to capture venue details for each location coordinate in each city neighbourhood.

DATA SUMMARY

City	Boroughs	Neighbourhoods
Toronto	10	103
New York	5	306
Paris	NA	20*

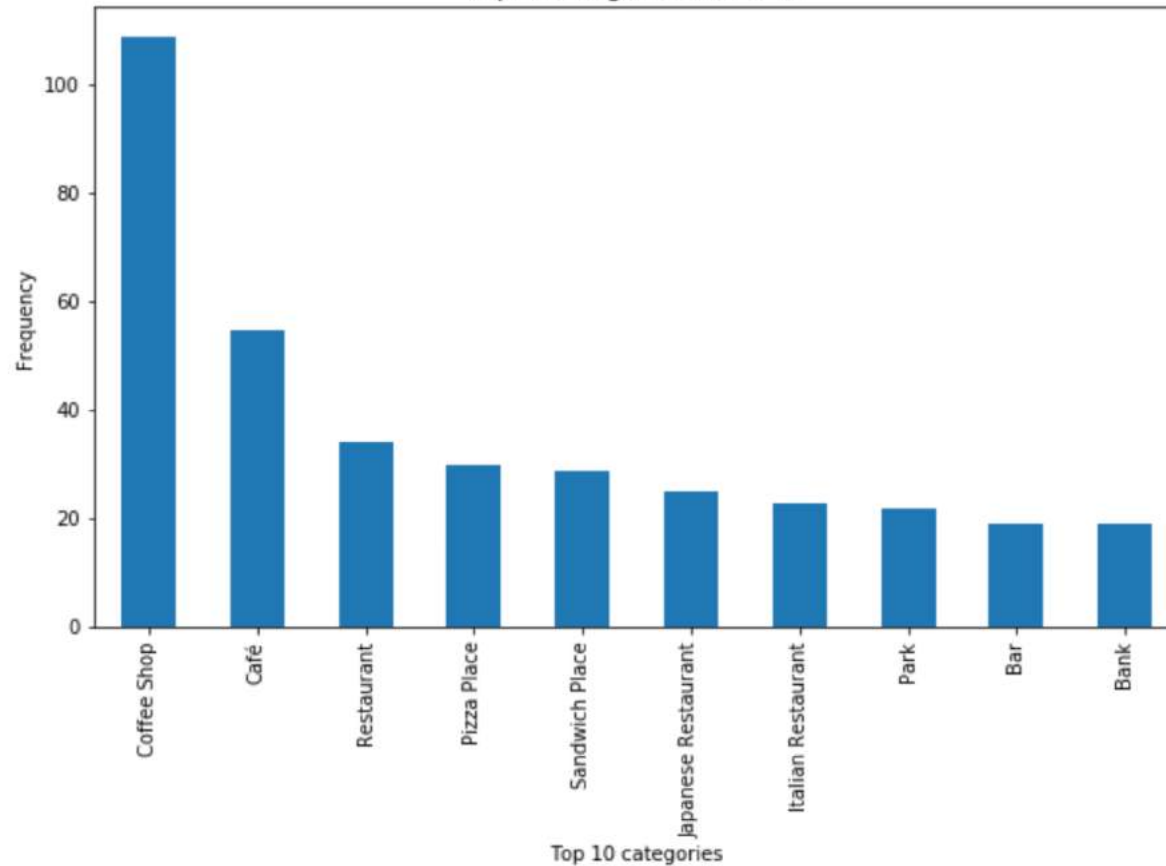
	Unique Categories	Neighborhoods/Zone	Radius for explore	Venues explored
Toronto	115	79	300	1151
New York	151	222	150	1467
Paris	134	20	500	1254

METHODOLOGY

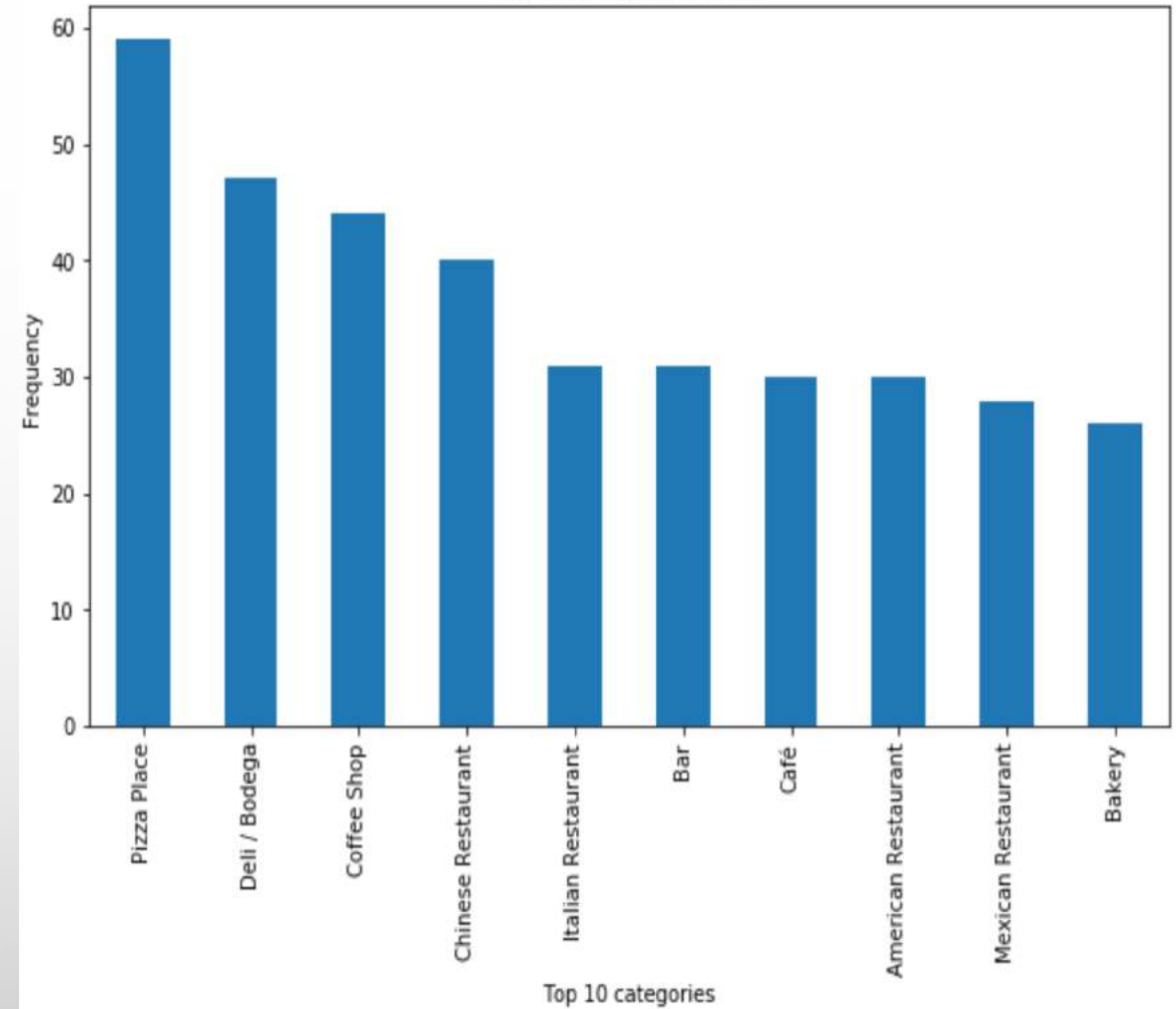
- ONE-HOT ENCODING
- FORESQUARE API CALLS
- GROUPING DATA BY NEIGHBOURHOOD AND APPLYING MEAN ACROSS NEIGHBOURHOODS

EXPLORATORY ANALYSIS

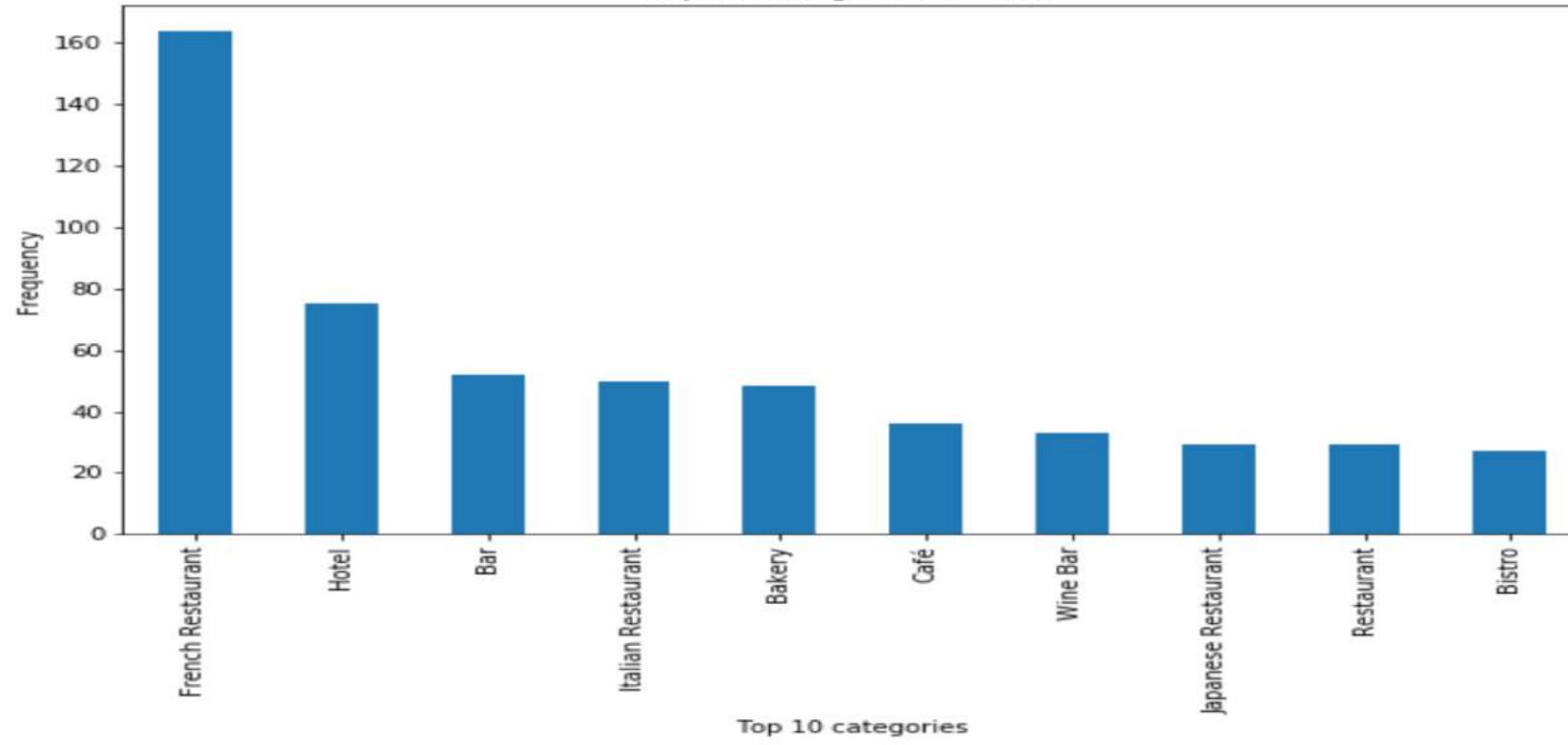
top 10 categories in toronto



top 10 categories in NY



top 10 categories in Paris



PRELIMINARY CONCLUSIONS

- TORONTO IS MORE DOMINATED BY CAFES AND COFFEE SHOPS.
- NARROW OUR FOCUS ON NEW YORK AND PARIS.
- KMEANS CLUSTER ANALYSIS ON NEW YORK AND PARIS.

K MEANS CLUSTER ANALYSIS APPROACH

- **K-MEAN UNSUPERVISED MACHINE LEARNING ALGORITHM**
- **TWO CLUSTERS FOR EACH CITY**
- **NUMBER OF CLUSTERS SELECTED BASED ON UNIFORM DISTRIBUTION OF NEIGHBOURHOODS ACROSS CLUSTERS**

1st Most Common Venue

Women's Store	43
Deli / Bodega	9
Ice Cream Shop	7
Bar	6
Liquor Store	6

CLUSTER ONE

2nd Most Common Venue

Food	43
Women's Store	27
Coffee Shop	7
Grocery Store	6
Deli / Bodega	6

New York Cluster Analysis
Cluster 1

1st Most Common Venue

French Restaurant	9
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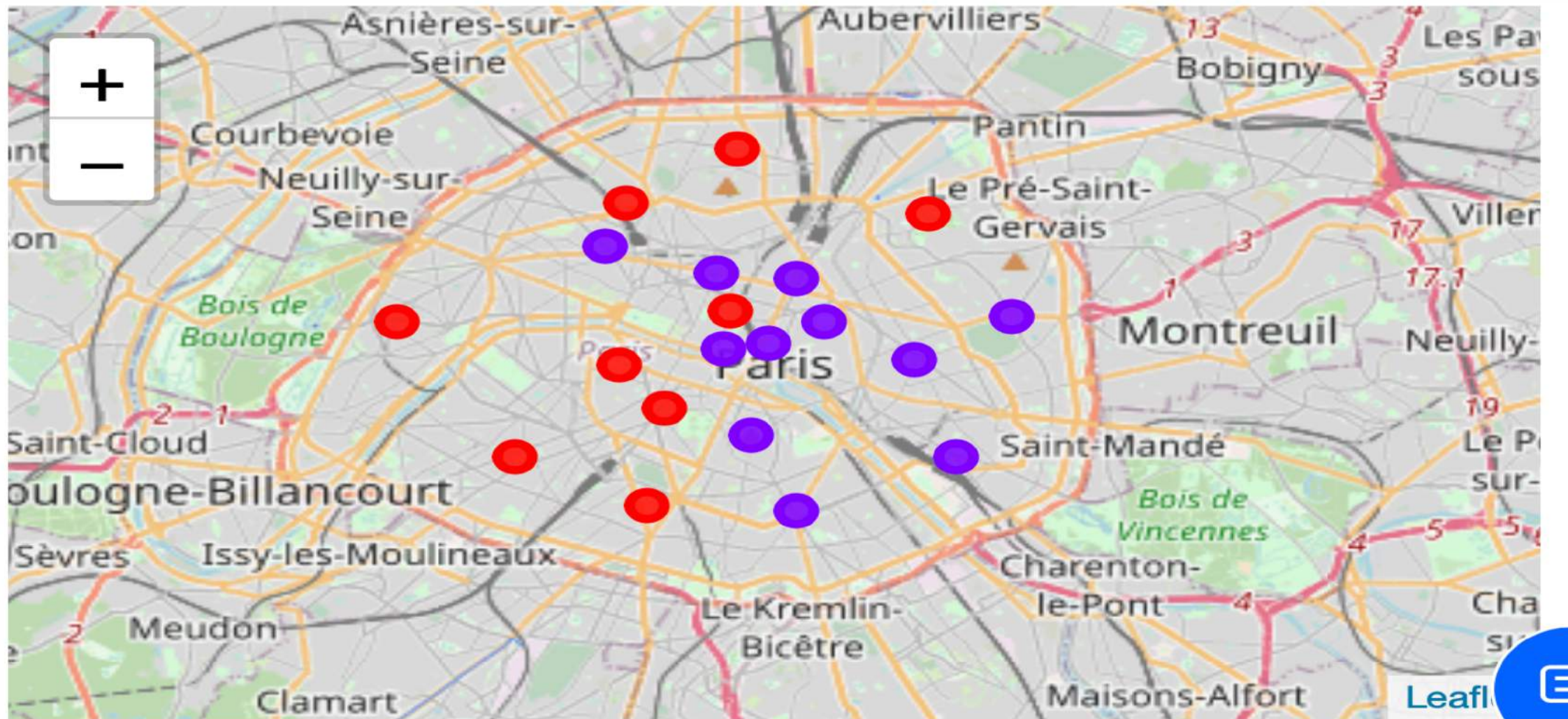
CLUSTER ZERO

2nd Most Common Venue

Hotel	3
Bar	3
Italian Restaurant	1
Café	1
Wine Bar	1

CLUSTER ZERO

Paris Cluster Analysis
Cluster 0



Paris map

	Neighborhoods	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	Postal Code	Latitude	Longitude
1	Paris 02 Bourse	French Restaurant	Wine Bar	Pizza Place	Italian Restaurant	Cocktail Bar	Bistro	Cheese Shop	Pastry Shop	Restaurant	Hotel	75002	48.8655	2.3426
5	Paris 06 Luxembourg	French Restaurant	Hotel	Chocolate Shop	Wine Bar	Pastry Shop	Restaurant	Clothing Store	Cocktail Bar	Miscellaneous Shop	Coffee Shop	75006	48.8493	2.3300
6	Paris 07 Palais-Bourbon	French Restaurant	Hotel	Café	Italian Restaurant	Bistro	Coffee Shop	Chocolate Shop	Restaurant	Seafood Restaurant	Japanese Restaurant	75007	48.8565	2.3210
13	Paris 14 Observatoire	French Restaurant	Bar	Italian Restaurant	Hotel	Vietnamese Restaurant	Bistro	Ice Cream Shop	Fish Market	Southwestern French Restaurant	Restaurant	75014	48.8331	2.3264
14	Paris 15 Vaugirard	French Restaurant	Hotel	Bar	Coffee Shop	Italian Restaurant	Supermarket	Thai Restaurant	Japanese Restaurant	Korean Restaurant	Lebanese Restaurant	75015	48.8412	2.3003
15	Paris 16 Passy	French Restaurant	Café	Grocery Store	Chinese Restaurant	Supermarket	Sandwich Place	Restaurant	Pizza Place	Asian Restaurant	Italian Restaurant	75016	48.8637	2.2769
16	Paris 17 Batignolles-Monceau	French Restaurant	Bar	Wine Bar	Hotel	Italian Restaurant	Restaurant	Thai Restaurant	Asian Restaurant	Bookstore	Creperie	75017	48.8835	2.3219
17	Paris 18 Buttes-Montmartre	French Restaurant	Bar	Café	Pizza Place	Italian Restaurant	Restaurant	Gastropub	Deli / Bodega	Wine Bar	Coffee Shop	75018	48.8925	2.3444
18	Paris 19 Buttes-Chaumont	French Restaurant	Italian Restaurant	Bar	Restaurant	Supermarket	Seafood Restaurant	Lebanese Restaurant	Moroccan Restaurant	Hotel	Vietnamese Restaurant	75019	48.8817	2.3822

CONCLUSIONS

- PARIS A STRONG CANDIDATE FOR SETTING UP THE WAREHOUSE DISTRIBUTION CENTRE.
- FOR SOME NEIGHBOURHOODS IN PARIS, THE **'TOP 10 COMMON VENUES' WERE FOOD OUTLETS.**
- FURTHER ECONOMIC ANALYSIS REQUIRED.