THE LIKABILITY OF A CITY IN RELATION TO MUNICIPALITY BONDS

JACKSON DE JESUS, DR. JEONG HO KIM

WHAT MAKES A CITY ATTRACTIVE TO LIVE IN?

ABSTRACT

To answer the question above, we use a revealed approach using machine learning. We hypothesized that an attractive city ought to attract better human capital translating to lower risk in municipalities in generating revenues. If this is the case, these muni bonds will be percieved as low risk and will inturn deliver low yields. To this end, we build a panel dataset of rouble 60 measure of city attractiveness. We will link these measures to muni bond yields and use machine learning techniques to find which dimension of city attractiveness are key in lowering muni bond yields.

INTRODUCTION

In recent years, It has been hypothesized that a city with attractive qualities ought to attract better human capital. Though it was been theorized, a tangible correlation has not been presented. The purpose of this research was to use a revealed preference approach using machine learning and muni bond yields to find which dimensions of city attractiveness are key in lowering the yields of the bond.

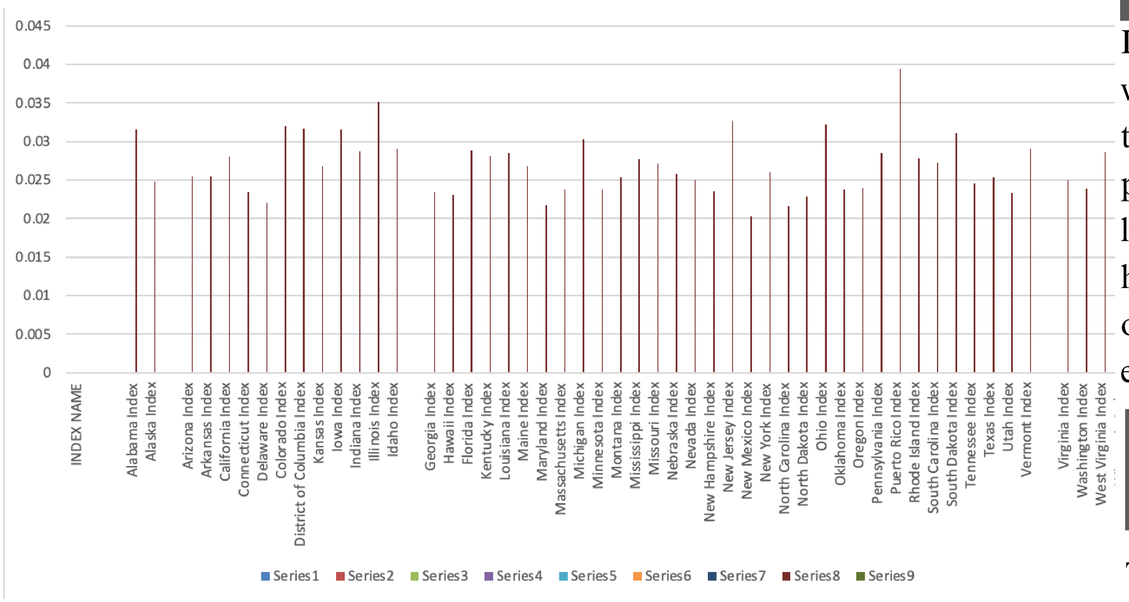

Figure 2. Sample municipality bond data

4	Favorable Weather	Heat Index		https://www.ncdc.noaa.gov
5	Social Connectedness Index	Average sale price of homes in the area.		https://www.census.gov/construction/nrs/index.html or facebook
6	Median House Value	Median dollar vlaue of owner occupied housing units		https://www.census.gov/programs-surveys/acs
7	ParkServe	inventory of parks for every urban area in the U.S., including Puerto Rico		https://www.tpl.org/parkserve
8	Hospitals	Number of hospitals and clinics per capita.		https://www.aha.org/statistics/fast-facts-us-hospitals
9	Air Quality	Levels of common pollutants (PM2.5, PM10, NO2, Ozone)		https://www.who.int/health-topics/air-pollution#tab=tab_1
10	Water Quality	Levels of contaminants in the water (like lead, chlorine, E. coli). or Water quality reports from local utilities or health departments.		https://www.epa.gov/ccr
11	Noise Pollution	Average decibel levels in residential and commercial areas.		https://www.epa.gov
12	Light Pollution	Nighttime light intensity measurements from satellite imagery		https://www.earthdata.nasa.gov
13	Cost of Living	Consumer Price Index (CPI) or Average rent and utility costs		https://www.bls.gov/cpi/
14	Unemployment Rate	Percentage of the labor force thatis unemployed		https://www.bls.gov/cps/
15	Cultural Facilities: Number of museums, theaters, galleries. Source: City cultural affairs departments	Number of cultural facilities (museums, theaters, galleries) per capita.		https://culturaldata.org
16	Diversity Index	Ethnic and racial composition of the population		https://www.census.gov
17	Crime Rate:	Number of reported crimes per 100,000 residents.		https://ucr.fbi.gov
18	Educational Institutions	Number of schools and colleges		https://nces.ed.gov
19	Public Transportation	Ridership numbers and trends.		https://www.transit.dot.gov/ntd
20	Road Quality:	Percentage of roads in good or poor condition. or Road maintenance and repair budgets.		https://infrastructurereportcard.org
21	Internet Speed	Average broadband and mobile internet speeds.		https://www.speedtest.net/global-index
22	Utilities Reliability	Frequency and duration of utility outages (electricity, water, gas).		https://www.eia.gov
23	Political Stability	Frequency and severity of political protests or unrest or Changes in government or leadership (frequency and nature).		https://acleddata.com
24	Policy Effectiveness:	Public satisfaction with government policies (survey data)		https://www.peresearch.org
25	Nightlife Options	Number of nightlife venues (clubs, bars, etc.) per capita		https://www.statista.com
26	Restaurant and Café Density:	Number of restaurants and cafes per capita or per square mile.		
27	Emergency Response Time	Average time taken for emergency services (police, fire, medical) to respond.		https://www.911.gov
28	Poverty Rate	Percentage of the population living below the poverty line		https://www.census.gov
29	Child Care Services	Availability of childcare facilities per capita.		https://www.census.gov
30	Innovation Index:	Number of patents filed per capita		https://www.uspto.gov
31	Renewable Energy Usage	Percentage of energy derived from renewable sources.		https://www.eia.gov
32	Carbon Footprint	Total greenhouse gas emissions per capita.		https://www.ourworldindata.org
33	Waste Management Efficiency	Recycling rates and waste diversion from landfills.		https://www.epa.gov
34	Obesity Rates	Percentage of the population classified as obese		https://www.cdc.gov
35	Library Resources	Number of libraries per capita and their geographic distribution.		https://www.imls.gov
36	Bicycle-Friendly Infrastructure:	Length and quality of bicycle lanes and paths or Bicycle sharing programs and their usage rates		https://www.bts.gov
37	Traffic Congestion Levels	Average commute times and delays due to traffic.		https://www.bts.gov
38	Airborne Allergen Levels	Concentration of common airborne allergens (pollen, mold, etc.).		https://www.cdc.gov
39	Pet-Friendly Amenities	Number of pet-friendly public spaces (parks, restaurants, etc.).		https://www.smartasset.com
40	Language Diversity Services	Availability of public services in multiple language or Language education programs and resources.		https://digital.gov
41	Tax	Tax rates (property, sales, income) and their comparison to regional averages.		https://taxfoundation.org
42	HOA	Prevalence and coverage of HOAs within the city.		https://www.census.gov/programs-surveys/ahs.html
43	Elderly Care Services	Availability and quality of elderly care facilities and services.		https://www.cms.gov
44	Fire Department Efficiency	Response times of fire services		

Figure 1. Sample Example Variables

RESULTS

During this research, this is an ongoing process which is still undergoing thorough research. As of today, we have accumulated 60 variables that present substantial evidence of depicting the likability of a city through a regression line. We hypothesize that there will be a pattern in the price of the municipality bond and the expression of each variable.

CONCLUSION

This currently an ongoing process which is still undergoing thorough research. As of today, we have accumulated 60 variables that present substantial evidence of depicting the likability of a city through a regression line. We hypothesize that there will be a pattern in the price of the municipality bond and the expression of each variable.

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