Business closures in the time of COVID
Project proposed by the Bank of Canada

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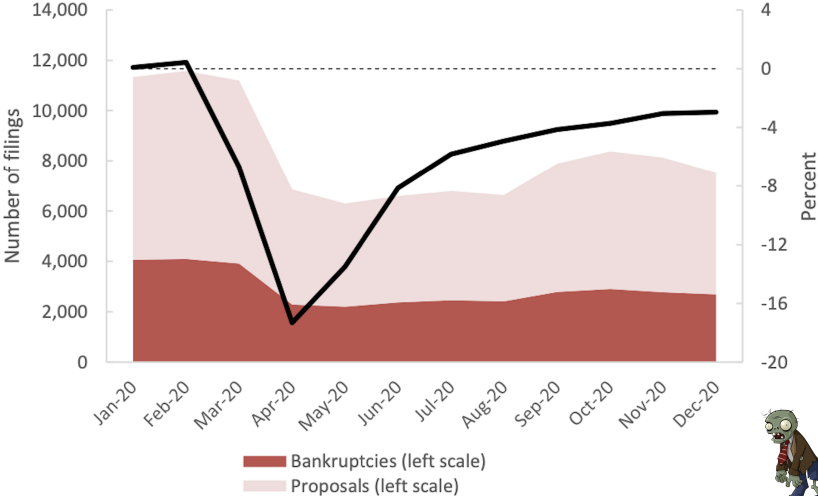
Talles Faria

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Daniel Rigobon

Philip Schnattinger

April 25, 2021

Motivation

How to quantify business entry/exists in real time ?
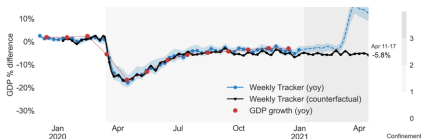

Source: StatCan, Government of Canada

Motivating Methodologies

Online scraping for real-time economic measurement

The OECD Weekly Tracker of economic activity

Using deep learning and Google Street View to estimate the demographic makeup of neighborhoods across the United States

Timnit Gebru[a,1], Jonathan Krause[a], Yilun Wang[a], Duyun Chen[a], Jia Deng[b], Erez Lieberman Aiden[c,d,e], and Li Fei-Fei[a]

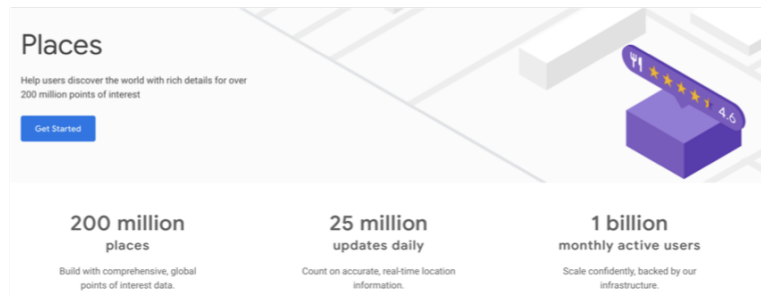THE BILLION PRICES PROJECT

AN ACADEMIC INITIATIVE TO IMPROVE MACROECONOMIC MEASUREMENT

RESEARCH PAPERS   DOWNLOAD DATA

Sources: Billion Prices Project, OECD

Broad Research Objectives

- Develop automated system to collect real-time business activity:
    - Google Places API system, Yelp Fusion API, online dataset from Yelp
- Cross sectional analysis: on some zip codes of Canada
- Time series analysis: proof of concept to track openings and closures

Methodology: Data Collection Pipeline

Cross-sectional Results: Share Closed Temporarily

Two examples, businesses split by FSAs
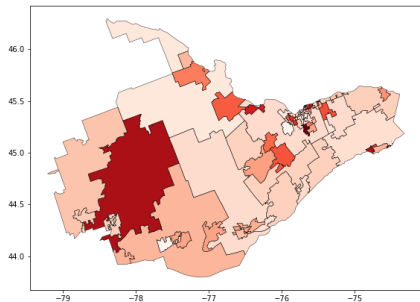
(a) Eastern Ontario
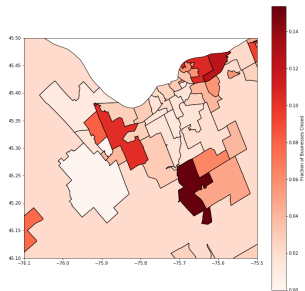
(b) Ottawa

Cross-sectional Results: Share Closed Temporarily

150,000 businesses in Eastern Ontario & British Columbia (300 FSAs)
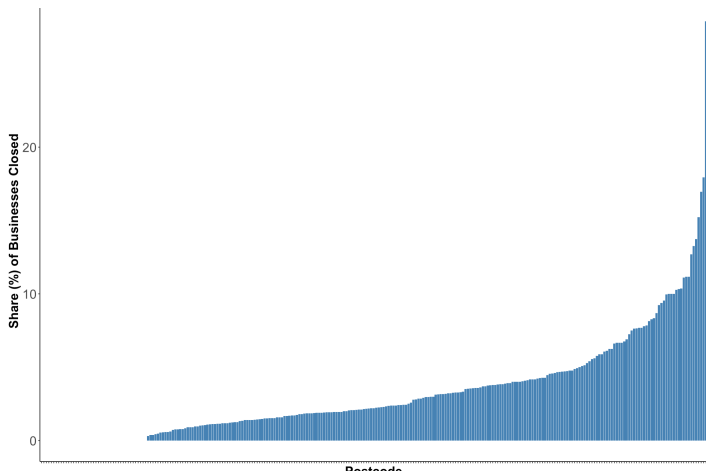
- if business is **both** a restaurant and bar: 9.45% temporarily closed
- if business is a restaurant but **not** a bar: 4.24% temporarily closed

Cross-sectional Results

Do Ratings Matter for Temporary Business Closures?

User ratings (max = 5) by business status and industry

■ Temporarily Closed ■ Open
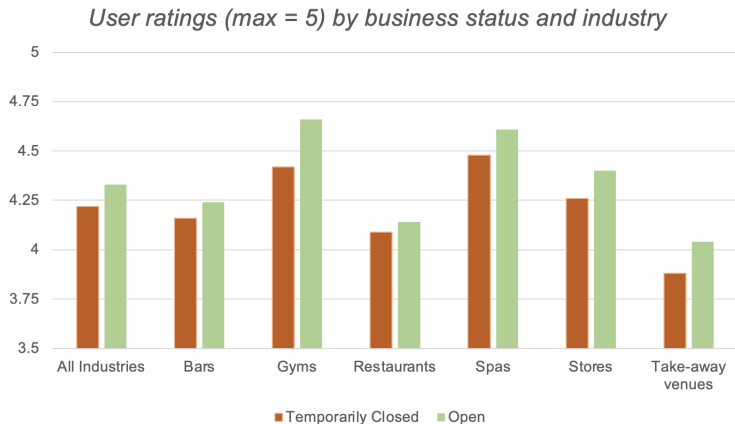
- Statistically significant, including at sub-sectors
- Potentially a method for examining "Zombie Firm" research question

Time-series Results: Openings and Closures
Proof-of-Concept

- Two snapshots of 'K' postal codes: April 12th and April 15th.

	Count (April 12th)	Count (April 15th)
Cafe	947	950
Nightclub	121	119

- Cafes: 6 new, 3 disappeared
- Nightclubs: 0 new, 2 disappeared

Concerns about data quality:

- Some 'new' cafes were open for the past two weeks (we called them)
- Business no longer in the dataset seem permanently closed

   Entries: X
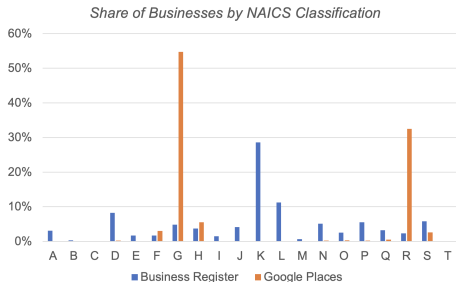   Exits: ✓

Challenge 1: Sector bias

Share of Businesses by NAICS Classification

|	Code	Industry Title
A	11	Agriculture, Forestry, Fishing and Hunting
B	21	Mining
C	22	Utilities
D	23	Construction
E	31-33	Manufacturing
F	42	Wholesale Trade
G	44-45	Retail Trade
H	48-49	Transportation and Warehousing
I	51	Information
J	52	Finance and Insurance
K	53	Real Estate Rental and Leasing
L	54	Professional, Scientific, and Technical Services
M	55	Management of Companies and Enterprises
N	56	Waste Management and Remediation Services
O	61	Educational Services
P	62	Health Care and Social Assistance
Q	71	Arts, Entertainment, and Recreation
R	72	Accommodation and Food Services
S	81	Other Services (except Public Administration)
T	92	Public Administration

Challenge 2: Reliability

Comparison of different datasets

Yelp Data	Yelp Api	Google Maps
Baghdad Cafe	Baghdad Cafe	Baghdad Cafe
Ben Z Noodle House	Burger King	Browns Crafthouse Seymour
Burger King	City of Vancouver	Burger King
Classic Pizza	CoCo Fresh Tea & Juice	Gyoza Bar
Crème de la Crumb	CoCo Fresh Tea & Juice	Keto Bakery Caveman
Curry Point	Curry Point	Keto Caveman Cafe
Fantastico Pizza 2001	Fantastico Pizza 2001	Malone's Taphouse
Goldies Pizza & Beer Lounge	Gyoza Bar	One Under
Gyoza Bar	Keto Caveman Cafe	Pizza 2001
Keto Caveman Cafe	Kim House	Pizza Vancouver
Malone's Social Lounge and Taphouse	Malone's Social Lounge and Taphouse	Wakwak Burger
One Under	Me + Crepe	Zaatar w Zeit
Pizza Vancouver	One Under	国子煎 Me and Crepe Downtown
Starbucks	Pizza Vancouver	
Wakwak Burger	Sharetea	
Zaatar W Zeit	Starbucks Reserve	
	Teaever Bubble Tea	
	Tim Hortons	
	Tractor	
	Wakwak Burger	

Query results for restaurants in 80m radius around The London Building, Vancouver, BC V6B 1V9, Canada
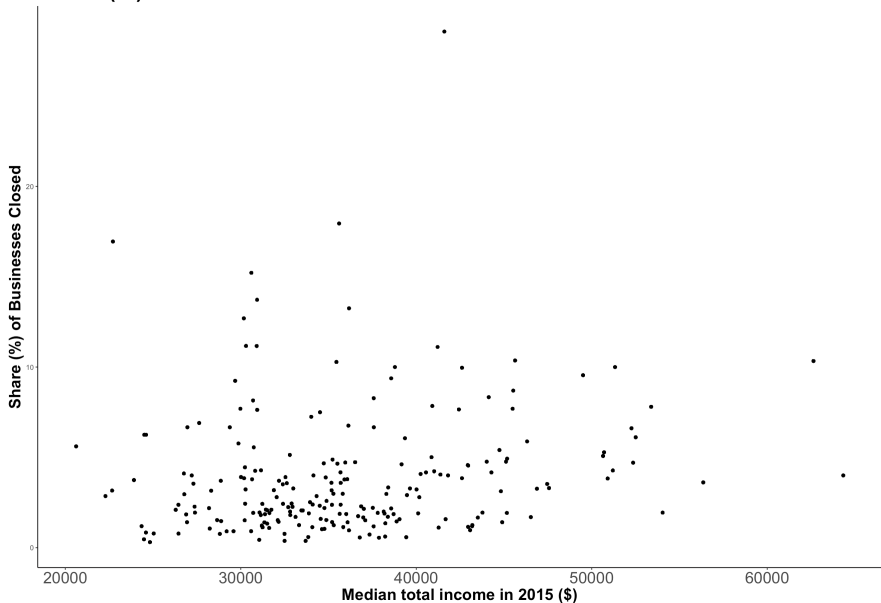
Potential Analytics: Merging with Census Data

Share (%) of Businesses Closed vs Unemployment Rate across Postcodes
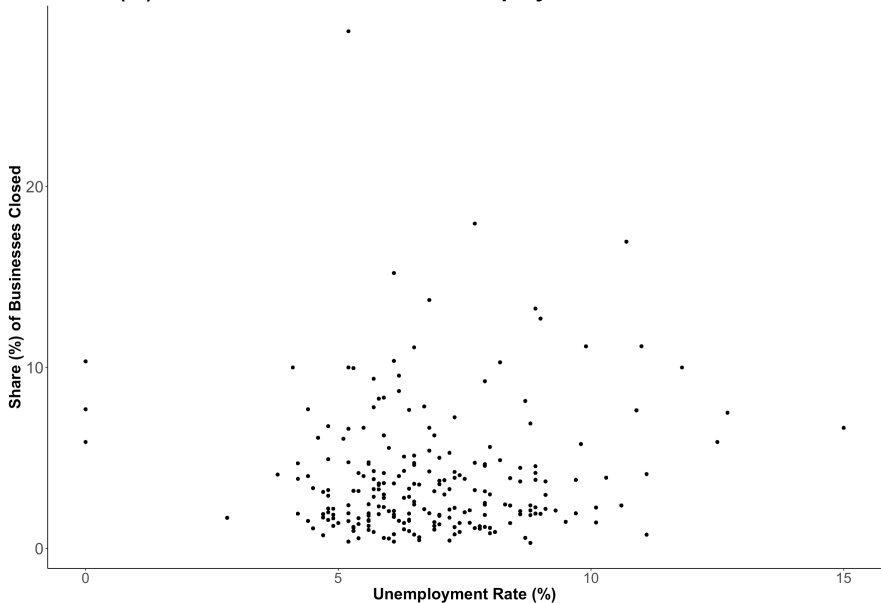
Potential Analytics: Merging with Census Data

Share (%) of Businesses Closed vs Median Income across Postcodes

Summary

- Demonstrated a proof of concept around using business data online to create a rich, real-time business activity database

- Shown that it is possible to use such an approach to create and maintain a time series database *going forward*

- Practical applications – useful for policy development (such as business support programmes) and evaluation

Next Steps
Suggested partnership between Bank of Canada and Google

About 2.8 million queries to cover Canada, 2.15 million for non-rural areas
$\implies$ Cost is a big issue...

A more formal relationship with Google would be an ideal solution:

- More cost-effective pricing scheme
- Easier access to Business ID to measure business entry and exit
- Potentially non-public additional information

$\implies$ Public policy applications attractive to Google's research teams ?

Thank You!
Group 2 - Bank of Canada: Business closures in the time of COVID

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