

An Examination of the Sales Impacts of the City of Walla Walla Streatery Policy

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Study goals

- To compare the growth rates in sales by streatery restaurants since the enactment of the City of Walla Walla streatery policy to growth rates in:
 - Other downtown restaurants
 - All restaurants in the City
- To compare the growth rates in sales by businesses adjacent to streatery restaurants to:
 - Sales at similar businesses throughout the City
 - Sales of streatery restaurants

Definition of terms

- DT “beneficiary” group = streateries
 - Includes 6 wineries & 11 restaurants
- Other DT restaurants = 16
 - Excluded those with incomplete data after Q2 2019
- All WW restaurants
 - Excludes all WW wineries
 - Includes all DT restaurants for descriptive statistics, excludes them in the econometric analysis

Data

- Source: WA Department of Revenue (DOR)
 - Public: “Quarterly Business Reviews”
 - Privileged: Monthly reports from the DOR by company, grouped into quarters
- Period: January 2018 through 3rd quarter of 2021
- Data challenges
 - In monthly reports, restaurant sales were often reported with a lag of one or more months
 - For some adjacent firms, sales were discontinuous or too recent to use
 - For other adjacent firms reported to us, no data were available

The data

Businesses adjacent to streateries

- A/o Q2 2021, they consisted of 17 businesses
 - 2 wineries
 - 2 furniture/home décor stores
 - 4 specialty food & beverage stores
 - 4 clothing stores
 - 1 general merchandise store
 - 1 miscellaneous merchandise store
 - 2 restaurants (not streateries)
 - 1 day spa
- A “consolidated” list excludes certain businesses due to data discontinuity or comparability reasons.
- A wide range of sales observed for these businesses

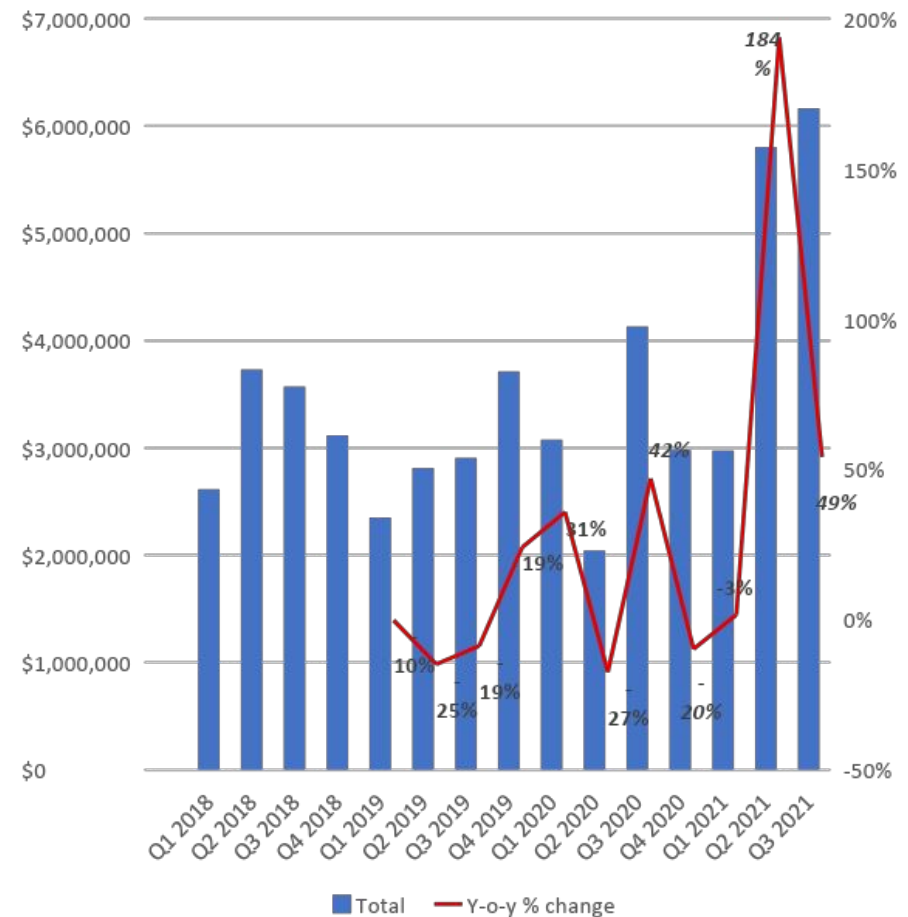
Methods

- Present the data, with the stated modifications, via a set of graphs charting quarterly year-over-year growth rates
- Analyze the data, with similar modifications, via statistical techniques
 - Approach: A “Difference-in-differences” model
 - The model allows for inference about the size of the differences between streateries and other businesses, that is, whether the reported differences are statistically significant.

Data summary of restaurant sales

Quarterly sales of streatery restaurants & wineries

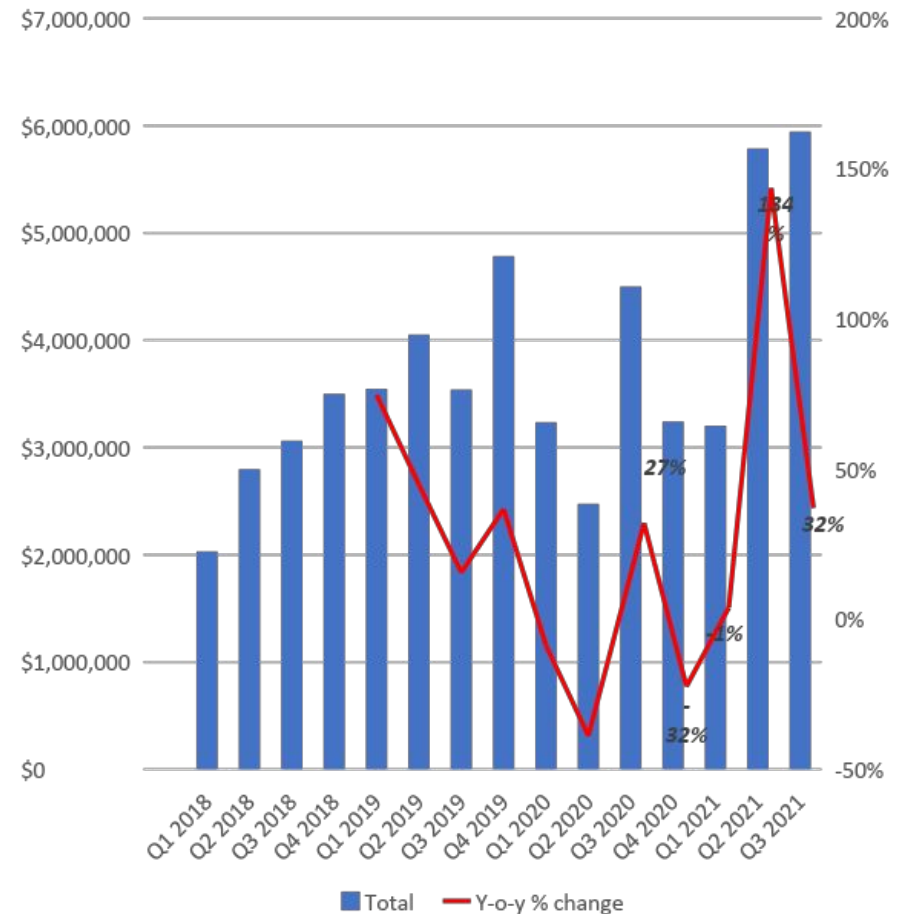
- Response to streatery options in the 1st quarter of the policy was highly positive: 42% gain over Q3 of 2019
- Subsequent two quarters lagged prior years' quarters
- Q2 & Q3 of 2021 brought huge increases
 - “Soft” y-o-y comparison in Q2
 - But Q2 revenues were far higher than same quarter in 2019 (\$5.8M vs. \$2.8M)
 - Q3 of 2021 also much larger (\$6.2M vs. \$2.9M) than in 2019



Data summary of restaurant sales

Quarterly sales of other downtown restaurants & wineries

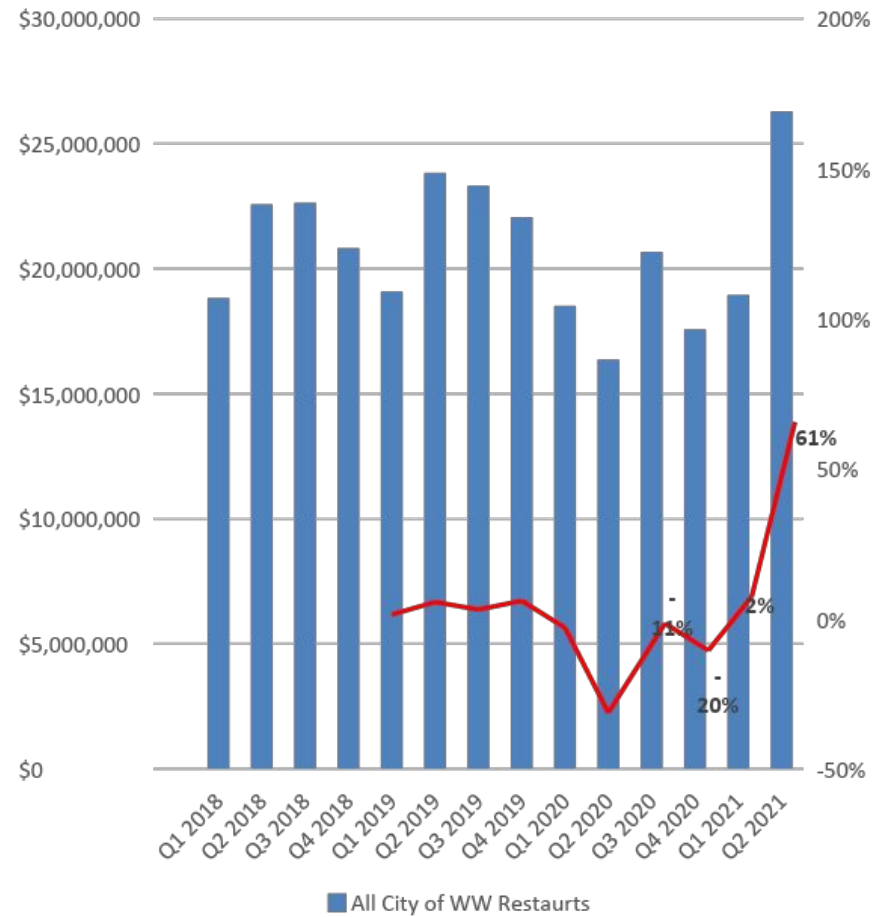
- Y-o-y gain in 1st quarter of new city policy (Q3 2020) was also large (27%) but not as high as for streateries.
- Subsequent 2 quarters yielded negative y-o-y growth, a little “deeper” than for streateries.
- Last 2 quarters showed very strong growth, albeit a bit less than for streateries.
 - Comparisons to same quarters in 2019 very strong



Data summary of restaurant sales

Quarterly sales in all restaurants in Walla Walla

- Generally, a much more modest recovery than seen in DT restaurants
- Revenue response in 1st quarter of new city policy was actually negative (-11%, y-o-y)
- Cumulative y-o-y results for 1st 2 quarters in 2021 slightly > same quarters in 2019



A summary of year-over year sales growth rates for the three groups of restaurants

- Since the start of the streatery policy, beneficiary restaurants & wineries have outperformed the other two groups of restaurants.

- DT restaurants have fared better than all restaurants.

Type	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021
Beneficiary restaurants & wineries	42%	-20%	-3%	184%	49%
DT restaurants - consolidated	15%	-36%	-7%	119%	29%
All of City of WW restaurants	-11%	-20%	2%	61%	n/a

- How much of the performance difference is due to policy cannot be determined.

Sales by adjacent businesses

Quarterly sales of DT businesses “adjacent” to streateries

- Since the start of the policy (Q3 2020), aggregate sales of nearby businesses for every quarter have shown y-o-y increases
- In most quarters, the % increase for the entire group has been *higher* than growth for the streateries



Sales of adjacent businesses

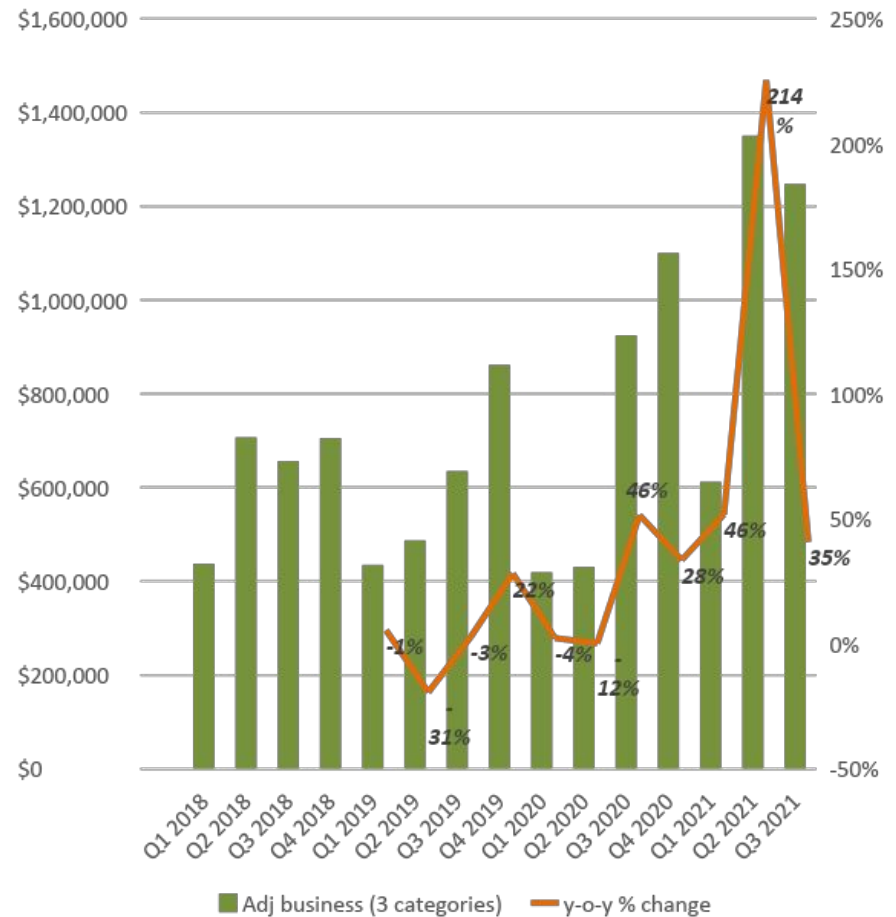
Creation of an “all-city” measure of similar businesses

- Goal: to create a city-wide benchmark for same types of businesses as represented by adjacent businesses to facilitate comparisons
- Necessary *exclusions* from “all City” measure & “unconsolidated” DT list
 - Wineries: Most have sales independent from a retail location
 - Specialty food retailers (2): Time series for the DT businesses didn’t include 2019 data
 - Miscellaneous retailers: An all-City measure contains a huge variety of enterprises, making comparisons spurious
 - Telecom: Assume that a good portion of reported sales by this business type cannot be traced to a retail location
 - Day spa: Could not easily find counterparts in City retail sales data

Sales of adjacent businesses

Sales of the “consolidated” set of adjacent businesses to streateries

- Totals are understandably lower than for the unconsolidated set of adjacent businesses
- But the pattern of y-o-y sales growth is very much the same



Sales of adjacent businesses

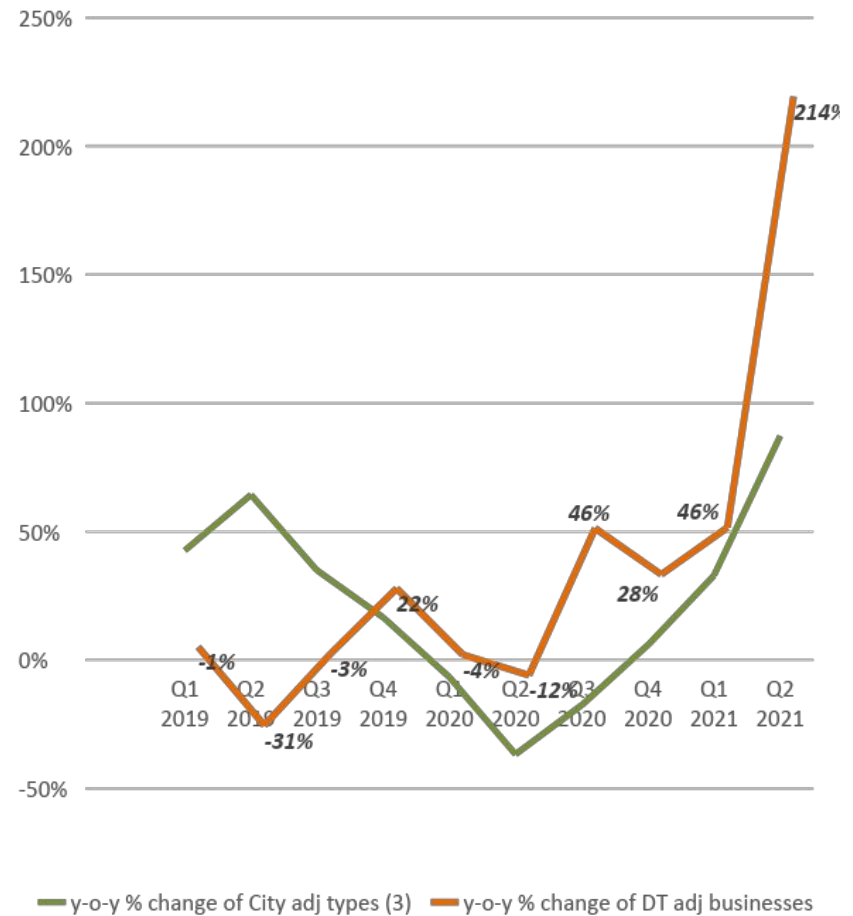
Creation of weights from a “consolidated” set of adjacent businesses

- Exclusions follow the same reasons as described for the creation of an appropriate all-City comparison
- Ultimately, 3 types of businesses make up the set – with weights
 - Furniture/home furnishings: 30%
 - Specialty food: 9%
 - Apparel: 61%
- With these three types, a like-to-like comparison possible between these DT businesses and their counterparts within the City
- *Interpretation* of all-City sales: what the total sales of these 3 business types would be if they had the same mix of DT adjacent businesses

Sales of adjacent businesses

Growth rates for 3 business types DT & City-wide

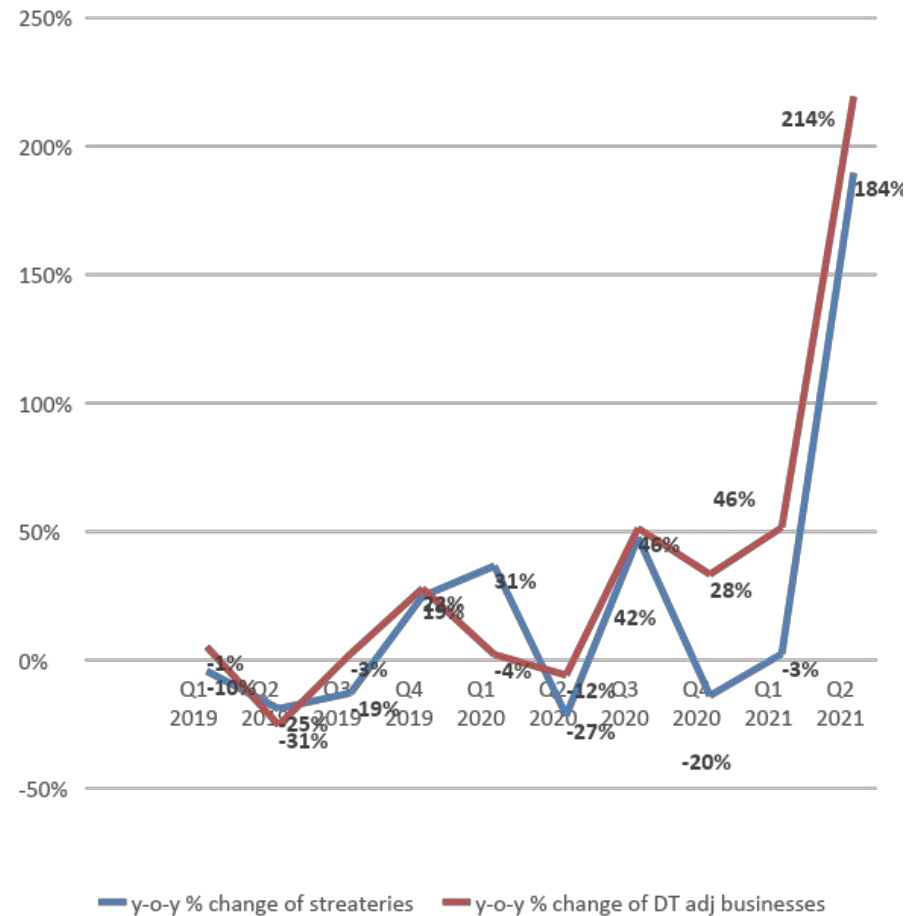
- Clear that since the start of the stay-at-home policy in Q3 of 2020, the y-o-y % sales increases in the 3 types of businesses in DT have been greater than an identical mix of those City-wide
- The DT adjacent businesses increased their out-performance in 2021 over the identical mix City-wide



Sales of adjacent businesses

Comparison of growth rates of adjacent businesses to growth rates of streateries

- Clear that since the start of the streatery policy in Q3 of 2020, the y-o-y % sales increases in the 3 types of adjacent businesses DT have actually been greater than those of the streateries.



Applying Econometric Modeling

To test the efficacy of a policy (permitting restaurants to use streateries), applying a difference-in-differences model allows us to compare treatment groups with other control groups in attempting to understand possible differential impacts.

Research Questions

(1) **Streateries vs. Downtown Restaurants**

- Was there a statistically significant difference in quarterly revenues between restaurants and wineries that utilized streateries compared to other downtown restaurants that can be attributed to the streatory?

(2) **Streateries to ALL Other Restaurants**

- Do we observe a statistically significant difference in quarterly revenues between streateries and all other restaurants in the City of Walla Walla that can be attributed directly to the streatory?

(3) **Streateries vs. Adjacent Businesses**

- Was there a statistically significant difference in quarterly revenues between streateries and businesses located adjacent to the streateries?

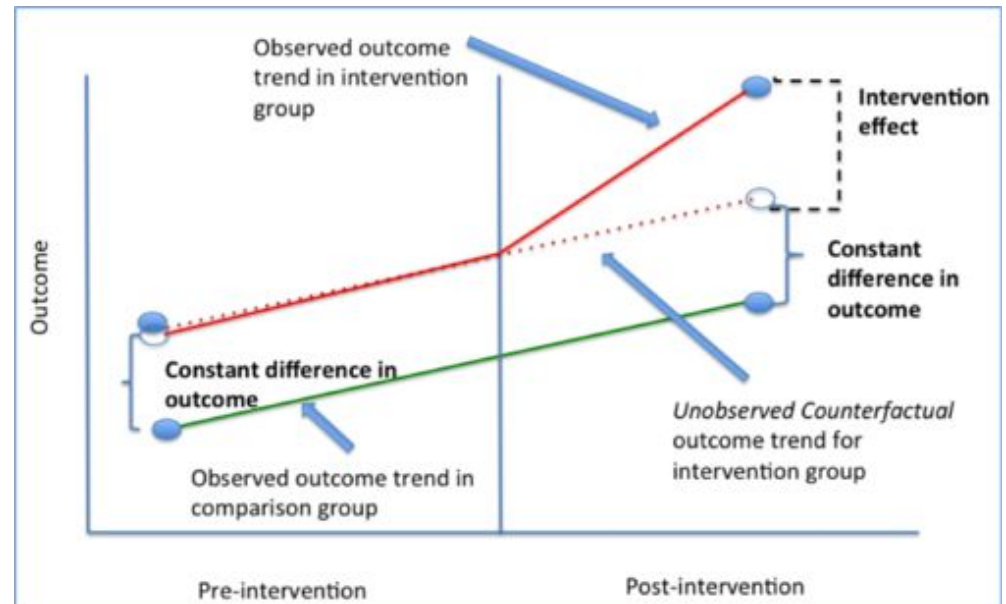
(4) **Adjacent Businesses to Other Similar Businesses**

- Do we observe a statistically significant difference in quarterly revenues between non-restaurant adjacent businesses when compared to other non-restaurant businesses in the City of Walla Walla that can be attributed to the location near a streatory?

Using a Difference-in-Differences Estimation Approach

Methodology

- Uses a treatment group & a control group
 - Streatery vs. Non-Streatery
 - Adjacent vs. Non-Adjacent
 - Downtown vs. Non-Downtown
- Compares the trends before and after an intervention (structural break) has occurred
 - Allowing some downtown restaurants and wineries to use streateries
- Assumptions
 - Linearity before & after
 - Uses dummy (1,0) variables for presence of the treatment (T) and post-intervention (P).
 - An interaction term is created for treated group in the post-intervention period. This is the DID measure.



$$Revenues_{i,t} = \alpha + \beta_1 Treatment_{i,t} + \beta_2 Post_{i,t} + \beta_3 Treat_{i,t}Post_{i,t} + \varepsilon_{i,t}$$

Limitations of the Data

- Protect privacy of individual firms and tax info
 - Aggregate by two-digit NAICS code
 - Use quarterly data (rather than monthly)
- Lags in reporting
 - Corrected in original data set
- Discontinuous reporting (firms entering / exiting)
 - Stata software allows for missing observations

Summary Statistics: Full Data Panel

Identifying the Treatment Sample (Quarterly Observations)

NAICS Code	Type	Streatery?		Total
		No	Yes	
31	Wine manufacturing	105	15	120
44-45	Retail Trade	225	0	225
72	Food Services	300	150	450
81	Other Services	15	0	15
Total		645	165	810

Identifying the Pandemic Break (Quarterly Observations)

NAICS	Type	Before	After	Total
31	Wine manufacturing	80	40	120
44-45	Retail Trade	150	75	225
72	Food Services	300	150	450
81	Other Services	10	5	15
Total		540	270	810
		67%	33%	

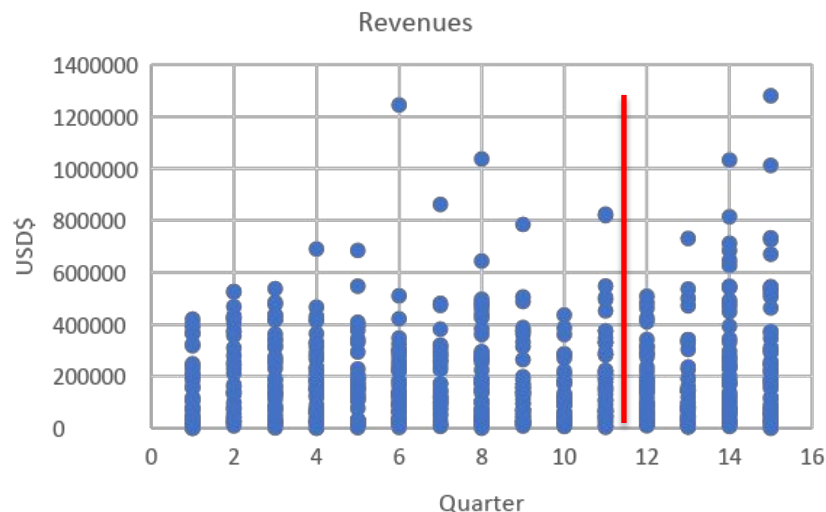
This analysis includes a PANEL DATA approach where data on the identified firms were tracked over a selected time period.

Identifying the Treatment Group

- Yes = Streatery
- No = Not a Streatery

Identifying the Structural (Pandemic) Break

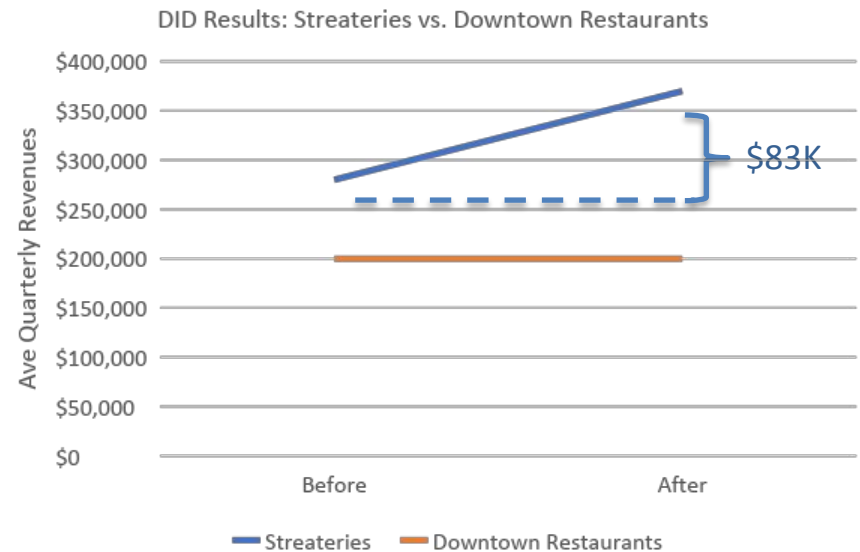
- Before: 2018 Q1 – 2020 Q2
- After: 2020 Q3 – 2021 Q3



Results: Impacts on Downtown Restaurants

Streateries vs. Downtown Restaurants

- There was a strong positive and statistically significant impact of having a streatory restaurant downtown.
- On average, the difference generated \$83,000 in additional quarterly revenues (\$27,666 per month) compared to other downtown restaurants that did not utilize a streatory.



DIFFERENCE-IN-DIFFERENCES ESTIMATION RESULTS

Number of observations in the DIFF-IN-DIFF: 431

	Before	After	
Control:	167	112	279
Treated:	97	55	152
	264	167	

Outcome var.	reven~s	S. Err.	t	P> t
Before				
Control	2.0e+05			
Treated	2.8e+05			
Diff (T-C)	8.4e+04	2.4e+04	3.47	0.001***
After				
Control	2.0e+05			
Treated	3.7e+05			
Diff (T-C)	1.7e+05	3.1e+04	5.34	0.000***
Diff-in-Diff	8.3e+04	4.0e+04	2.09	0.037**

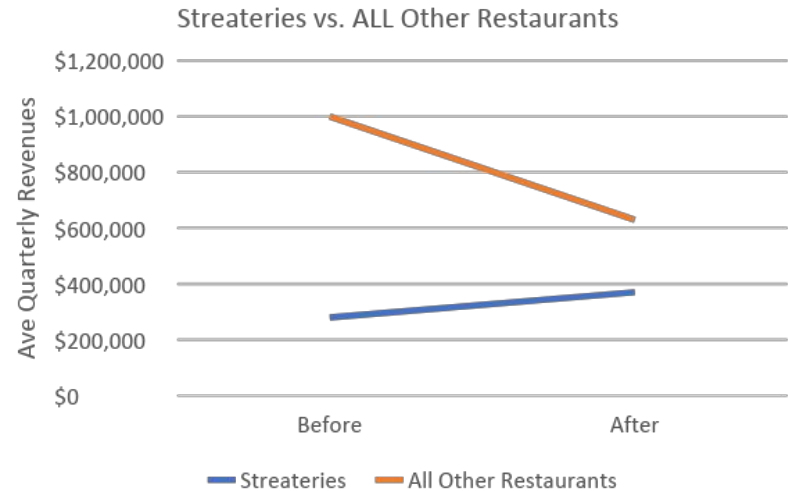
R-square: 0.09

* Means and Standard Errors are estimated by linear regression

Inference: * p<0.01; ** p<0.05; * p<0.1

Results: Impacts on ALL Other Restaurants

- Streateries vs. ALL Other Restaurants in sample
 - Although there is a difference in quarterly revenues, the difference can not be attributed to the streateries themselves.
 - No statistically significant difference between the control group and the treated group's DID measure.
 - Differences in revenues could be due to heterogeneity in type of restaurant, the location being outside of the downtown area or differential response to the pandemic.



DIFFERENCE-IN-DIFFERENCES ESTIMATION RESULTS

Number of observations in the DIFF-IN-DIFF: 445

	Before	After	
Control:	177	116	293
Treated:	97	55	152
	274	171	

Outcome var.	revenue	S. Err.	t	P> t
Before				
Control	1.0e+06			
Treated	2.8e+05			
Diff (T-C)	-7.2e+05	3.1e+05	-2.37	0.018**
After				
Control	6.3e+05			
Treated	3.7e+05			
Diff (T-C)	-2.6e+05	4.0e+05	0.67	0.505
Diff-in-Diff	4.6e+05	5.0e+05	0.92	0.360

R-square: 0.02

* Means and Standard Errors are estimated by linear regression

Inference: * p<0.01; ** p<0.05; * p<0.1

Results: Impact on Adjacent Businesses

Reduced vs. Induced Demand

- Research Question: Does the reduction in available parking positively or negatively impact sales of adjacent businesses?
- Hypothesis 1: Reduced Demand (Revenues \downarrow)
 - Fewer parking spots might deter customers.
- Hypothesis 2: Induced Demand (Revenues \uparrow)
 - Customers using streeteries may also choose to shop at adjacent businesses.
- Therefore, the net effect can not be predicted ahead of time.
 - The predicted sign (+ or -) is ambiguous, a priori

Results: Impact on Adjacent Businesses

Streateries vs. Adjacent Businesses

- There is no evidence that adjacent businesses were negatively impacted by the presence of streateries.
- In fact, during the time period, quarterly revenues of adjacent businesses increased as well.

DIFFERENCE-IN-DIFFERENCES ESTIMATION RESULTS

Number of observations in the DIFF-IN-DIFF: 439

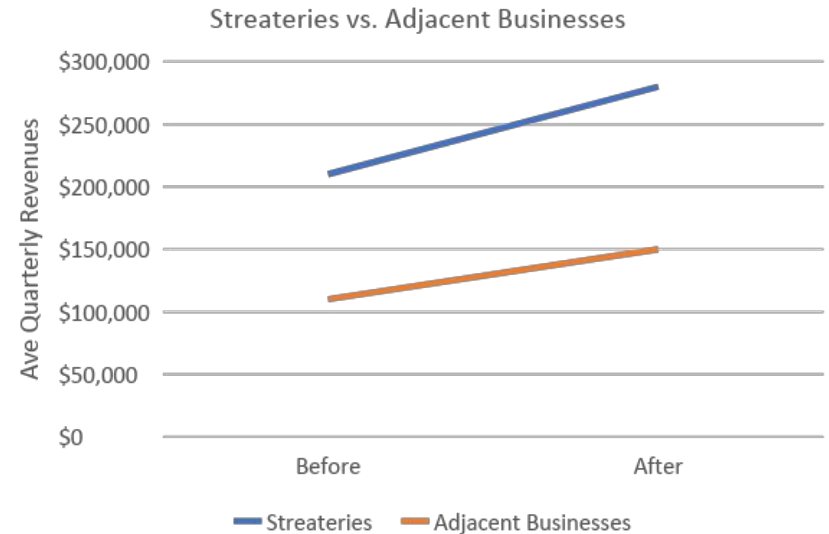
	Before	After		
Control:	131	84	215	
Treated:	144	80	224	
	275	164		

Outcome var.	reven~s	S. Err.	t	P> t
Before				
Control	1.1e+05			
Treated	2.1e+05			
Diff (T-C)	9.7e+04	1.9e+04	5.01	0.000***
After				
Control	1.5e+05			
Treated	2.8e+05			
Diff (T-C)	1.3e+05	2.5e+04	5.13	0.000***
Diff-in-Diff	3.1e+04	3.2e+04	1.00	0.320

R-square: 0.12

* Means and Standard Errors are estimated by linear regression

Inference: * p<0.01; ** p<0.05; * p<0.1



Results: Comparing Adjacent Businesses to Other Similar Businesses

- Only considers businesses with NAICS Code = 44-45 (Furniture/Home, Apparel/Jewelry, Misc. Retail)
- Both groups experienced an uptick in revenues following the streatory policy.
- No evidence was found that adjacent businesses underperformed relative to other similar businesses throughout the city due to the presence of the streateries.
- In fact, adjacent businesses had a small positive difference due to the streateries, but the result was not statistically significant.

DIFFERENCE-IN-DIFFERENCES ESTIMATION RESULTS
 Number of observations in the DIFF-IN-DIFF: 84

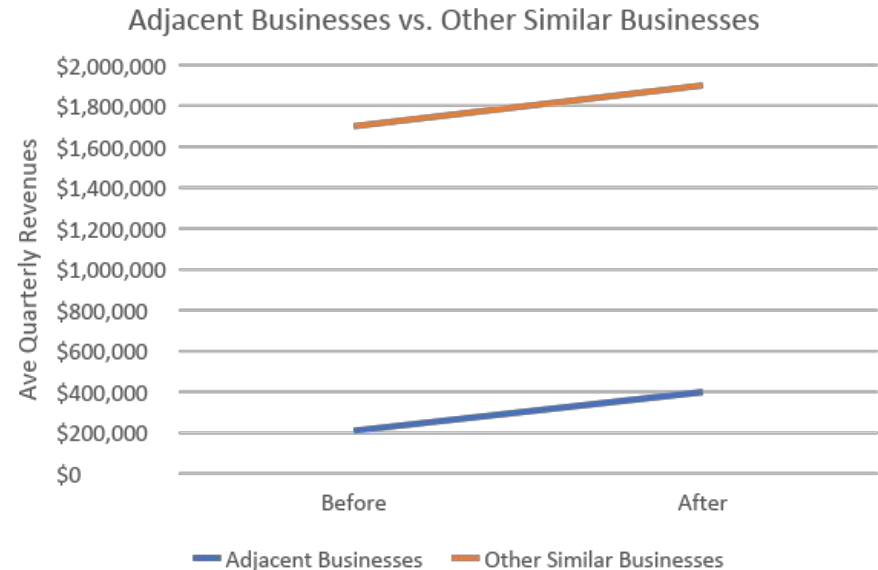
	Before	After	
Control:	30	12	42
Treated:	30	12	42
	60	24	

Outcome var.	reven~s	S. Err.	t	P> t
Before				
Control	1.7e+06			
Treated	2.1e+05			
Diff (T-C)	-1.5e+06	2.8e+05	-5.50	0.000***
After				
Control	1.9e+06			
Treated	4.0e+05			
Diff (T-C)	-1.5e+06	4.4e+05	3.33	0.001***
Diff-in-Diff	6.5e+04	5.2e+05	0.13	0.900

R-square: 0.34

* Means and Standard Errors are estimated by linear regression

Inference: * p<0.01; ** p<0.05; * p<0.1



Results: Impact on Other Downtown Restaurants (Non-Streateries)

- Comparing Other Downtown Restaurants (No Streatery) to Non-Downtown Restaurants
- DT Restaurants saw an increase in revenues compared to Non DT Restaurants.
- There is no statistical evidence that downtown restaurants saw any 'crowding out' of sales due to the presence of the streateries.

DIFFERENCE-IN-DIFFERENCES ESTIMATION RESULTS

Number of observations in the DIFF-IN-DIFF: 28

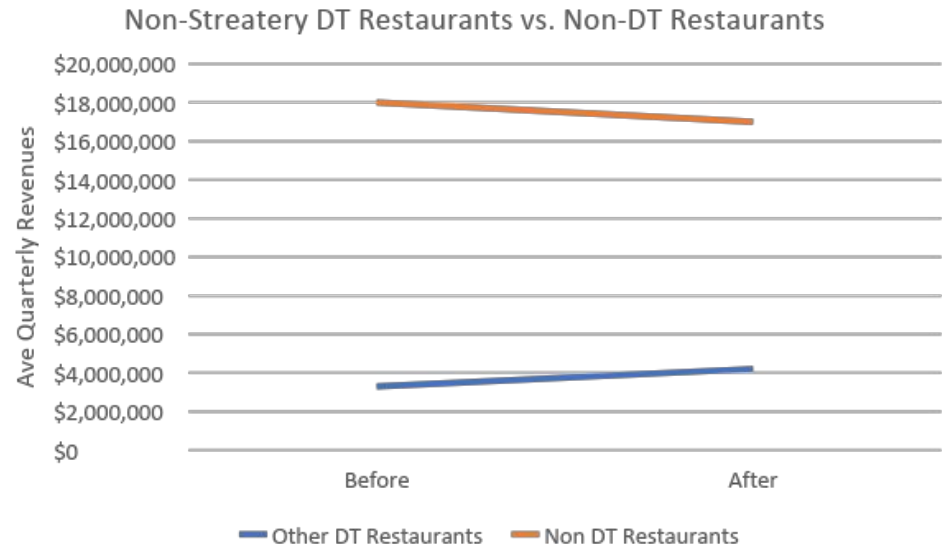
	Before	After	
Control:	10	4	14
Treated:	10	4	14
	20	8	

Outcome var.	reven~s	S. Err.	t	P> t
Before				
Control	1.8e+07			
Treated	3.3e+06			
Diff (T-C)	-1.4e+07	7.8e+05	-18.14	0.000***
After				
Control	1.7e+07			
Treated	4.2e+06			
Diff (T-C)	-1.3e+07	1.2e+06	10.10	0.000***
Diff-in-Diff	1.7e+06	1.5e+06	1.15	0.259

R-square: 0.95

* Means and Standard Errors are estimated by linear regression

Inference: * p<0.01; ** p<0.05; * p<0.1



Summary of Econometric Findings

- Utilizing a streatery allowed downtown restaurants and wineries to experience a significant increase in revenues, about \$27,666 per month from Q3 2020 to Q3 2021.
- During this same period, other downtown restaurants saw relatively flat revenue streams.
- Although all other restaurants (in the City) saw an average decline in revenues, this decline could not be attributed directly to the streateries.
- Businesses that were adjacent to a streatery were not negatively impacted by the presence of the streateries and, in fact, also saw increasing revenues.
- As a double-check, non-restaurant businesses who were adjacent to the streateries saw similar growth rates as non-restaurant businesses outside of downtown, for NAICS 44-45
- Concurrent with the streateries, other downtown restaurants performed slightly better than their counterparts outside of downtown.