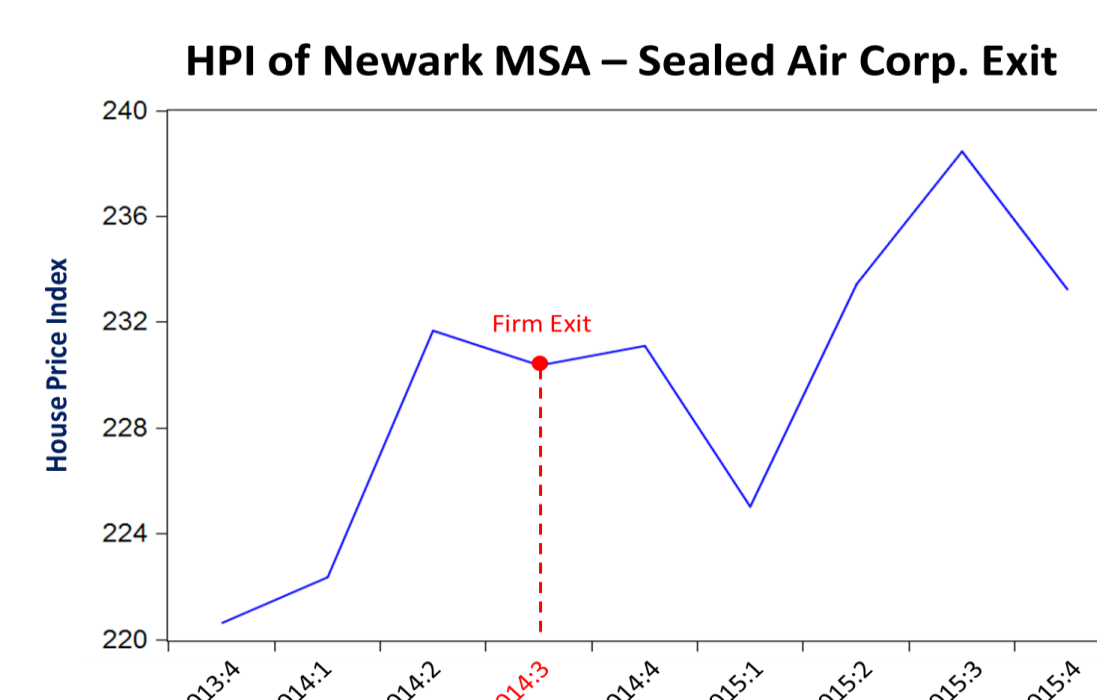
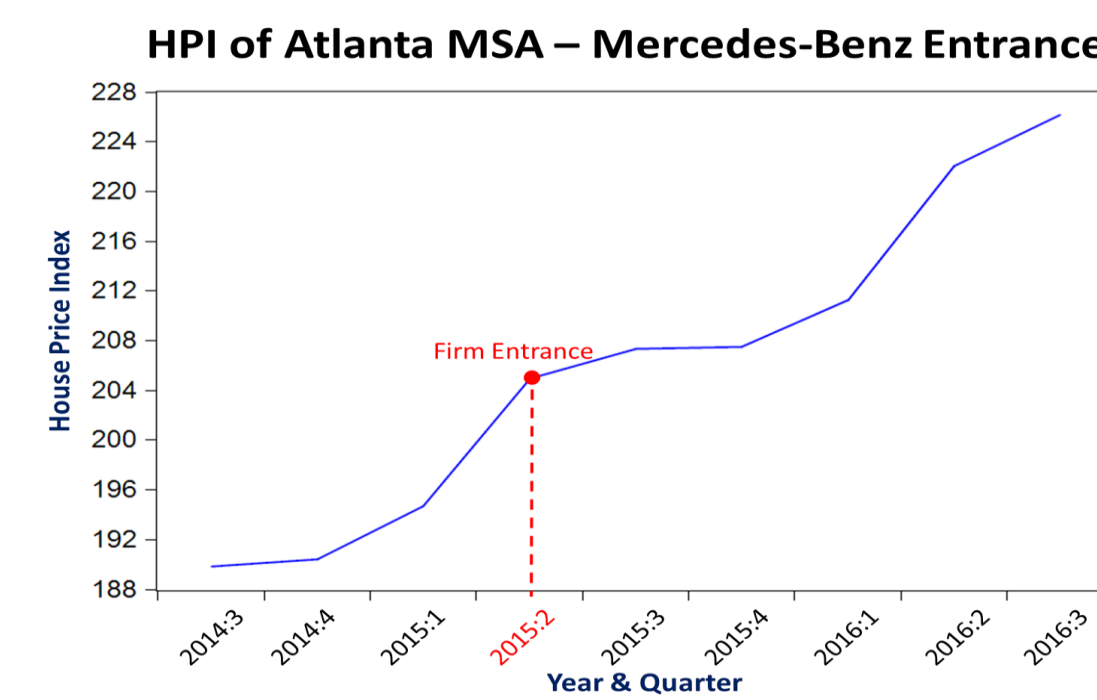


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The House Price Impacts of Corporate Headquarter Relocations

MOTIVATION

- Positive HQ Event → brings employees and their families, increases local economic activity, and potentially an increase in house prices
- Negative HQ Event → employees and their families exit MSA, decreases local economic activity, and potentially a decrease in house prices

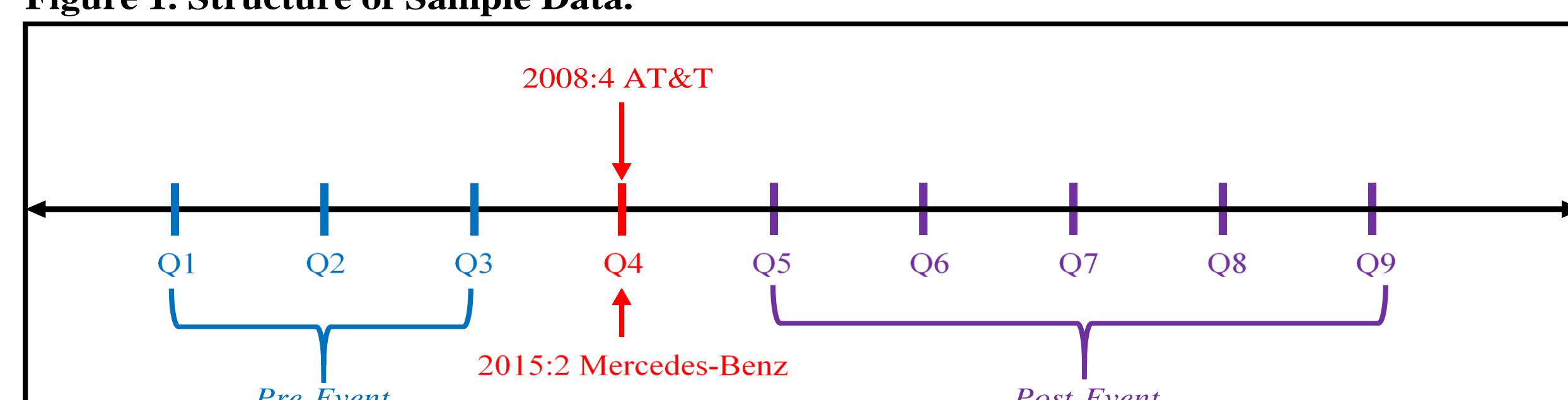


SAMPLE CONSTRUCTION AND DATA ISSUES

- Sample includes 34 corporations that relocate by exiting/entering a metropolitan statistical area (MSA)
- Select house price data 3 quarters before a HQ event and 5 quarters after in order to identify a possible house price effect from a HQ event

Sample MSA	State	2010 Population	Median HH Income	Unemployment Rate	% of Population Age 25-64
Event Houston-The Woodlands-Sugar Land	TX	5,920,416	\$ 51,685	4.8%	54.2%
Comp Miami-Fort Lauderdale	FL	5,564,635	\$ 41,943	5.8%	52.3%
Event Dallas-Fort Worth-Arlington-Plano	TX	6,371,773	\$ 54,180	5.1%	55.1%
Comp Philadelphia-Camden-Wilmington	PA-NJ-DE	5,965,343	\$ 57,831	5.4%	53.1%
Atlanta-Sandy Springs-Roswell	GA	5,286,728	\$ 57,307	6.2%	56.0%
Comp Phoenix-Mesa-Scottsdale	AZ	4,192,887	\$52,957	4.9%	52.4%
Event San Antonio-New Braunfels	TX	2,142,508	\$46,203	4.7%	51.3%
Comp Kansas City	MO-KS	2,009,342	\$53,464	5.7%	54.3%
Event Chicago-Naperville-Arlington Heights	IL	7,262,718	\$ 58,946	6.2%	56.0%
Comp Boston-Cambridge-Newton	MA-NH	4,552,402	\$ 66,870	4.8%	55.2%
Event Washington-Arlington-Alexandria	DC-VA-MD	5,636,232	\$ 81,163	3.8%	69.8%
Comp San Francisco-Redwood City	CA	4,335,391	\$74,560	5.0%	59.5%
HQ Seattle-Tacoma-Bellevue	WA	3,439,809	\$ 61,740	4.8%	57.7%
Comp Minneapolis-St. Paul-Bloomington	MN	3,348,859	\$ 63,866	5.2%	55.7%
HQ Detroit-Dearborn-Livonia	MI	4,296,250	\$ 53,953	9.9%	53.2%
Comp Riverside-San Bernardino-Ontario	CA	4,224,851	\$ 54,991	8.3%	51.8%
HQ Charlotte-Concord-Gastonia	NC-SC	2,217,012	\$ 51,702	6.4%	55.4%
Comp Indianapolis-Carmel	IN	1,715,459	\$52,607	5.1%	45.1%

Figure 1. Structure of Sample Data.



EMPIRICAL RESULTS

- House Price Appreciation Rates

	R_HPICOMP	R_HPIMSA	R_HPIDIFF
Mean	0.7797	0.8384	0.0587
Median	1.1120	1.0756	-0.2046
Maximum	9.7254	10.8758	14.8780
Minimum	-14.3028	-9.3044	-9.6714
Std. Dev.	3.2918	2.9907	2.8317
Observations	280	280	280

- HPI Appreciation Rate: HQ Exit > Comparable MSA – not statistically significant

Corporation Name	Event Yr/Qtr	MSA	Event Yr/Qtr Appreciation Rate	
			HPI MSA	Comp MSA
1 Boeing	2001Q2	Seattle, WA	1.74%	-4.35%
2 Comerica Bank	2007Q3	Detroit, MI	-6.96%	-7.07%
3 MillerCoors	2008Q3	Milwaukee, WI	-1.11%	-0.81%
4 AT&T	2008Q4	San Antonio, TX	-4.45%	-2.14%
5 First Data	2009Q3	Denver, CO	0.74%	1.78%
6 Top Golf	2012Q3	Chicago, IL	1.89%	0.33%
7 Fiesta Restaurants	2012Q4	Miami, FL	4.19%	1.56%
8 Pulte Group	2013Q2	Detroit, MI	8.37%	7.45%
9 Sealed Air Corp.	2014Q3	Newark, NJ	-0.58%	0.36%
10 Big Brothers Big Sisters	2015Q1	Dallas, TX	3.99%	0.43%
11 Mercedes-Benz	2015Q2	Newark, NJ	3.67%	3.80%
Average House Price Appreciation Rate			1.04%	0.91%

- HPI Appreciation Rate: HQ Enter > Comparable MSA – not statistically significant

Corporation Name	Event Yr/Qtr	MSA		Event Yr/Qtr Appreciation Rate	
		Entry MSA	Comparable MSA	HPI MSA	Comp MSA
1 Boeing	2001Q2	Chicago, IL	Boston, MA	2.93%	4.78%
2 Hardee's	2001Q2	St. Louis, MO	Tampa, FL	3.76%	2.56%
3 Nissan	2005Q3	Nashville, TN	Milwaukee, WI	1.58%	2.02%
4 Comerica Bank	2007Q3	Dallas, TX	Philadelphia, PA	-0.74%	-0.19%
5 MillerCoors	2008Q3	Chicago, IL	Boston, MA	-3.88%	-2.63%
6 AT&T	2008Q4	Dallas, TX	Philadelphia, PA	-1.53%	-1.76%
7 DaVita Inc.	2009Q2	Denver, CO	Baltimore, MD	4.16%	-1.24%
8 First Data	2009Q3	Atlanta, GA	Phoenix, AZ	4.31%	-0.08%
9 Northrop Grumman	2010Q3	Washington, DC	San Francisco, CA	-1.60%	-2.47%
10 Starwood Hotels	2012Q1	Bridgeport, CT	Ventura, CA	3.59%	1.14%
11 Fiesta Restaurants	2012Q4	Dallas, TX	Philadelphia, PA	1.55%	2.97%
12 Pulte Group	2013Q2	Atlanta, GA	Phoenix, AZ	2.67%	3.37%
13 Archer Daniels Midland	2014Q3	Chicago, IL	Boston, MA	1.25%	0.72%
14 Sealed Air Corp.	2014Q3	Charlotte, NC	Indianapolis, IN	-1.21%	0.93%
15 Occidental Petroleum	2014Q4	Houston, TX	Miami, FL	2.07%	0.80%
16 Mercedes-Benz	2015Q2	Atlanta, GA	Phoenix, AZ	5.14%	3.31%
Average House Price Appreciation Rate				1.50%	0.89%

- HPI Appreciation Rate: HQ Exit as Merger < Comparable MSA
- HQ Enter/Join Workforce < Comparable MSA

Corporation Name	Yr/Qtr	MSA		Appreciation Rate	
		Event MSA	Comparable MSA	HPI MSA	Comp MSA
1 Nextel*	2005Q3	Washington, DC	San Francisco, CA	4.07%	6.48%
2 Nextel	2005Q3	Kansas City, MO	San Antonio, TX	0.09%	1.50%
3 Continental Airlines*	2010Q4	Houston, TX	Miami, FL	-1.87%	-2.33%
4 Continental Airlines	2010Q4	Chicago, IL	Boston, MA	-4.36%	-2.32%
5 XM Radio*	2011Q1	Washington, DC	San Francisco, CA	-1.17%	-3.15%
6 Teavana*	2012Q4	Atlanta, GA	Phoenix, AZ	0.61%	3.17%
7 Teavana	2012Q4	Seattle, WA	Minneapolis, MN	2.60%	0.34%
8 Gentiva Health Services*	2014Q3	Atlanta, GA	Phoenix, AZ	0.45%	0.03%
Average House Price Appreciation Rate – Exit as a HQ & Merge				0.42%	0.84%
Average House Price Appreciation Rate – Enter with existing workforce				-0.56%	-0.16%

ECONOMETRICS MODEL

- Use difference-in-differences estimation to capture the impacts of a corporation's headquarter relocation on house prices in a specific MSA and point in time

- Model 1: $R_hpidiff = \alpha + \beta eventd_j + \epsilon_j$

	Coefficient	Std. Error	T-stat	Prob.	Stat. Sig.?	Mean	CI @ 90%
Entrance	0.614	0.578	1.063	0.290	No	0.059	(-0.889, 1.007)
Exit	0.135	0.949	0.142	0.889	No	0.026	(-1.530, 1.582)
Positive Event	0.455	0.516	0.882	0.379	No	-0.089	(-0.935, 0.757)
Negative Event	-0.039	0.851	-0.045	0.964	No	0.2339	(-1.162, 1.630)
FULL MODEL	0.229	0.479	0.479	0.632	No	0.0587	(-0.729, 0.844)

- Model 2: Pools all Events with Interaction Term

$$R_hpidiff = \alpha + \beta_1 eventd_j + \beta_2 Goodevent_j + \beta_3 eventd_j * Goodevent_j + \epsilon_j$$

	Coefficient	Std. Error	t-stat	Prob.	Stat. Sig.?	CI @ 90%
Eventd _j	-0.0386	0.7094	-0.0544	0.9566	No	(-1.1047, 1.2221)
Goodevent _j	-0.1664	0.2461	-0.6761	0.4996	No	(-0.76064, 0.87804)
Eventd _j * Goodevent _j	0.6596	0.9938	0.6637	0.5074	No	(-1.5711, 1.6885)

- Adjusted R² and F-statistic test

- Model 2 fits the data best
- Variables in Model 2 are not jointly statistically significant → impacts the regression model

CONCLUSION

- House price appreciation rates are greater on average in MSAs experiencing an exit or entrance of a HQ than comparable MSAs
- Expect an impact of a HQ relocation event on house prices but cannot detect an effect at the MSA level
 - Improve current model with a larger sample of HQ relocation events
 - Future models → disaggregate data
 - Action is probably at the sub-city, zip-code level
 - Expect multiplier effect