



# Fiscal Implications of Remote Work

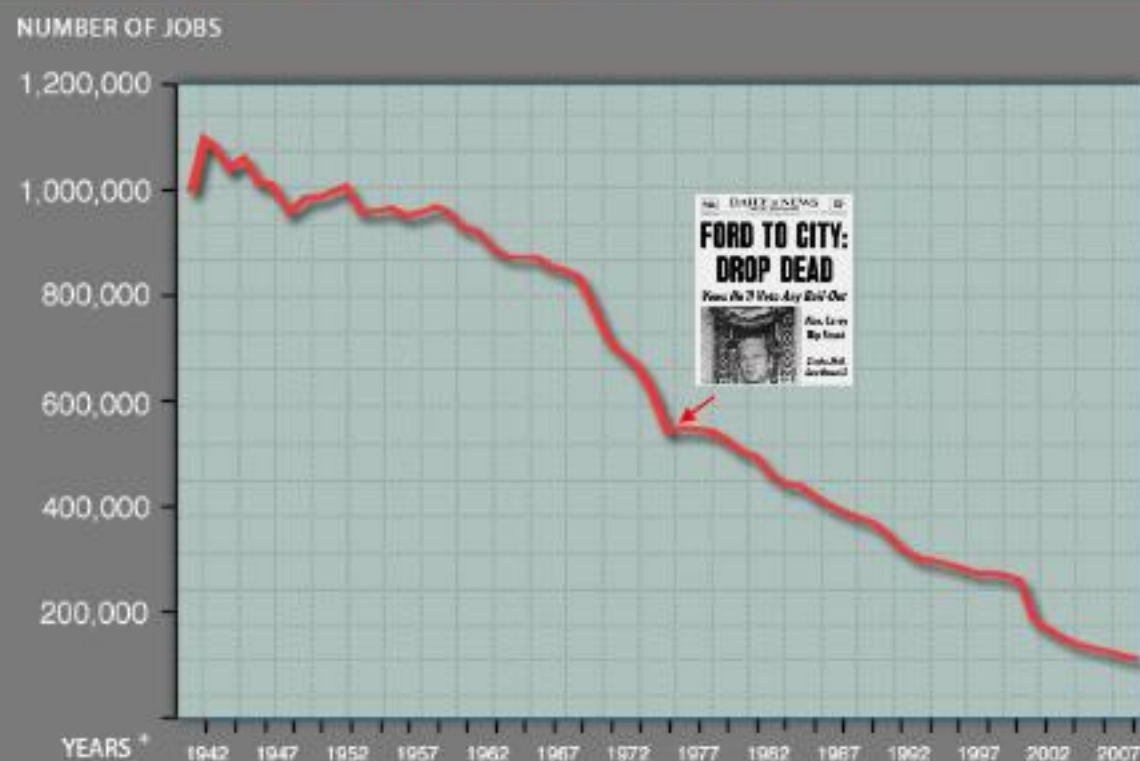
Arpit Gupta

Associate Professor of Finance, NYU Stern

# Historical Context: Deindustrialization

Devasted New York City's industrial base, but only saw 10% Loss in Population in **1970s**

New York City Manufacturing Jobs Since World War II

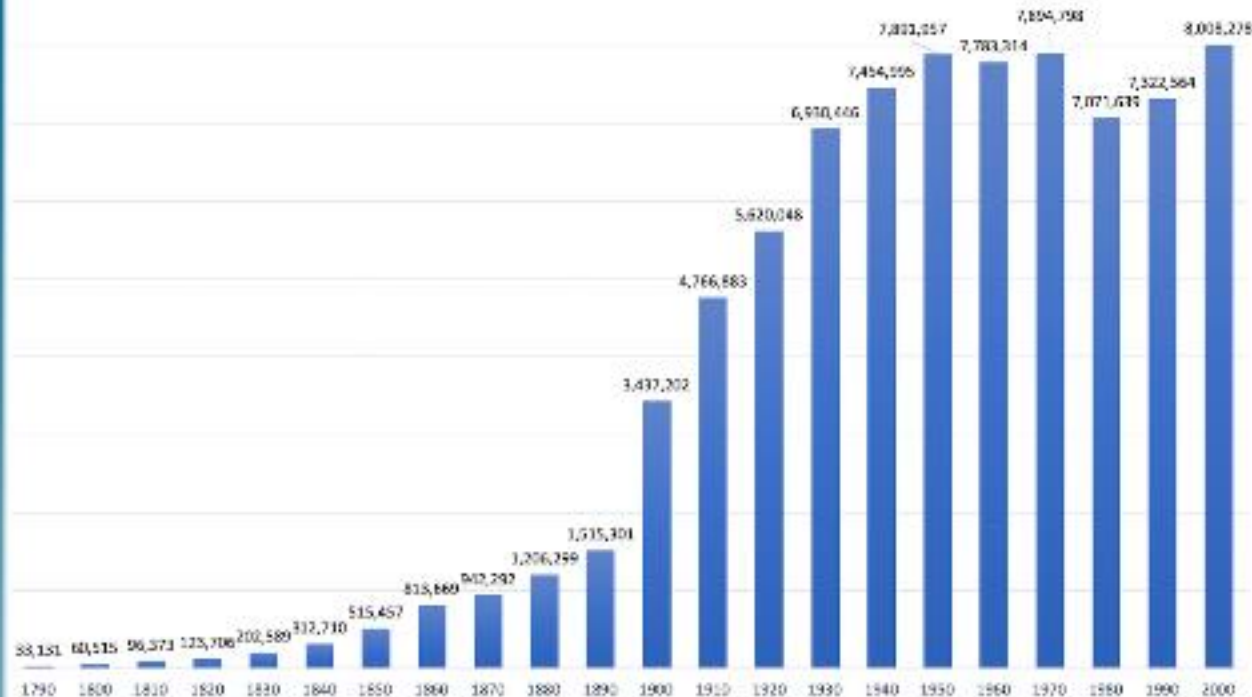


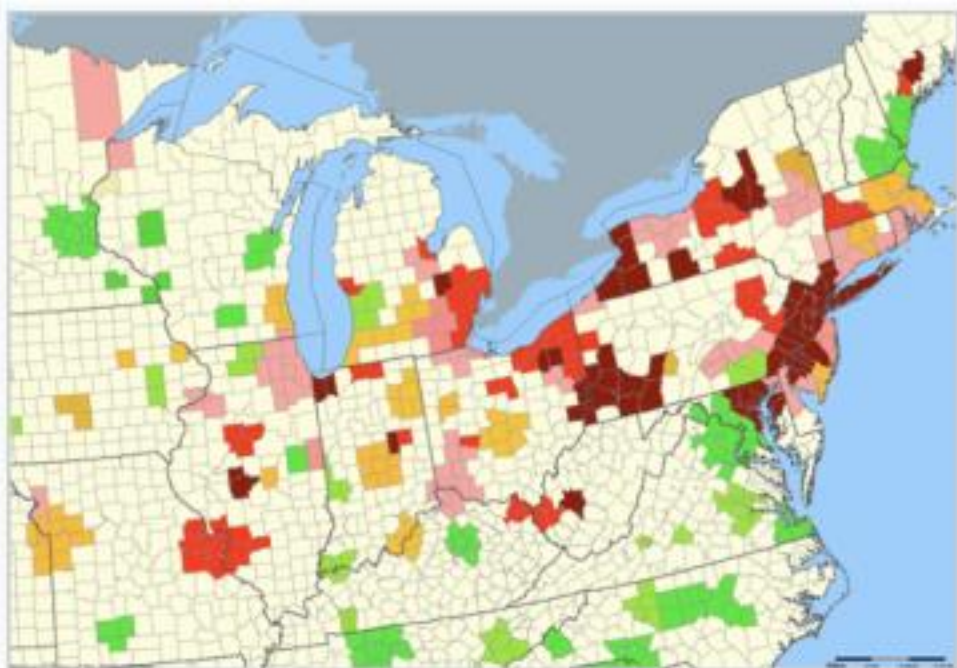
\* Note: Manufacturing job data for 1942-2000 provided under Standard Industrial Classification (SIC) codes; manufacturing job data for 2000-2007 provided under the North American Industrial Classification System (NAICS).

Source: New York State Department of Labor

NYC Population 1790-2000

10% Loss in Population from peak





Change in total number of manufacturing jobs in metropolitan areas, 1954–2002 (figures for New England are from 1958).

- >58% loss
- 43–56% loss
- 31–43.2% loss
- 8.7–29.1% loss [United States average: 8.65% loss]
- 7.5% loss – 54.4% gain
- >62% gain

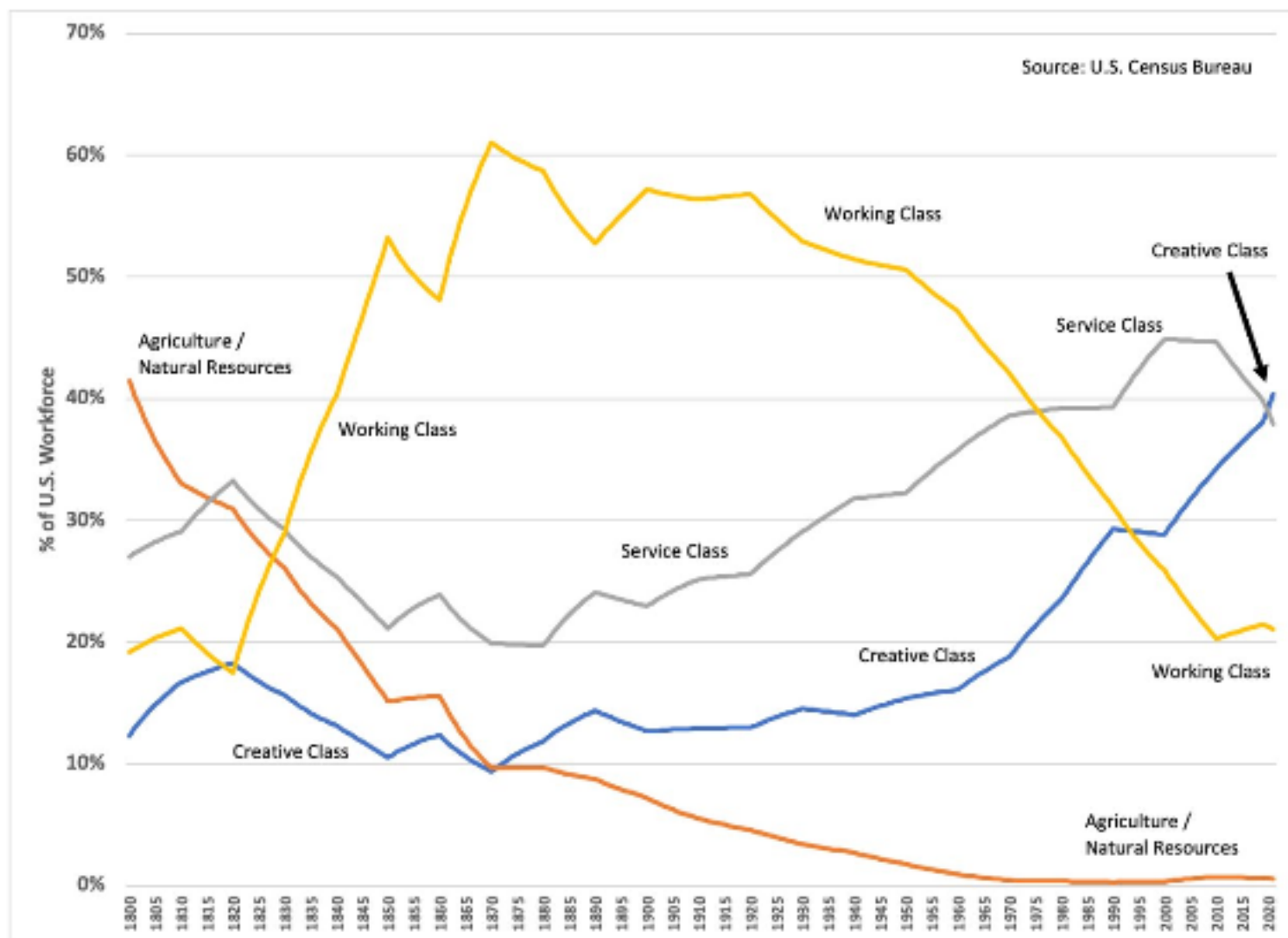
# Rust Belt Decline

Large drops in population from 1950s peaks by the 2000s

City	2020 Population	Peak	% Decline from Peak
<a href="#">Chicago, Illinois</a>	2,746,388	3,620,962	24%
<a href="#">Detroit, Michigan</a>	639,111	1,849,568	65%
<a href="#">Cleveland, Ohio</a>	372,624	914,808	59%
<a href="#">St. Louis, Missouri</a>	301,578	856,796	65%
<a href="#">Pittsburgh, Pennsylvania</a>	302,971	676,806	55%
<a href="#">Buffalo, New York</a>	278,349	580,132	52%
<a href="#">Cincinnati, Ohio</a>	309,317	503,998	39%
<a href="#">Toledo, Ohio</a>	270,871	383,818	29%
<a href="#">Akron, Ohio</a>	190,469	290,351	34%
<a href="#">Dayton, Ohio</a>	137,644	262,332	48%
<a href="#">Flint, Michigan</a>	81,252	196,940	59%
<a href="#">Gary, Indiana</a>	69,903	178,320	61%
<a href="#">Youngstown, Ohio</a>	60,068	170,002	65%
<a href="#">South Bend, Indiana</a>	103,453	132,445	22%

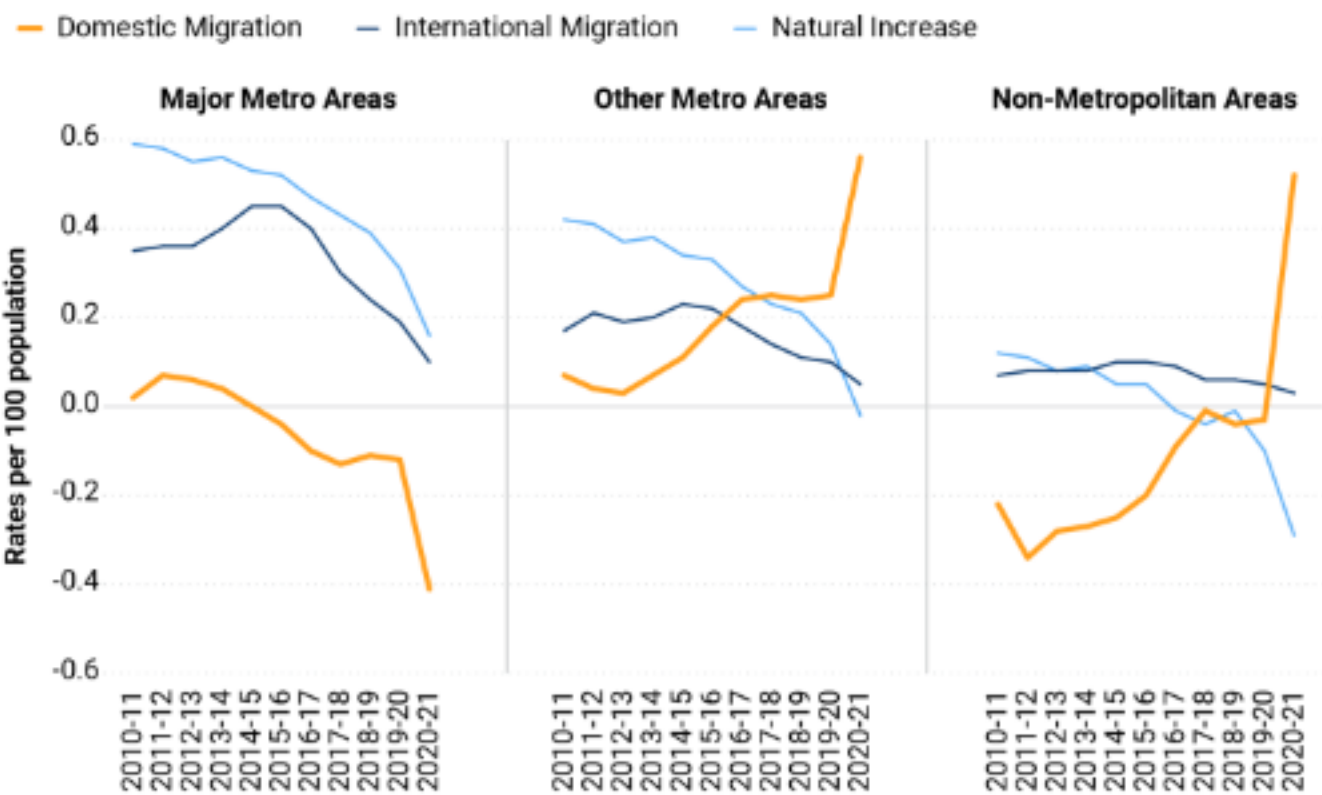
# White Collar Work Saved (Some) Cities

Growth in service/creative class workers post-1970s

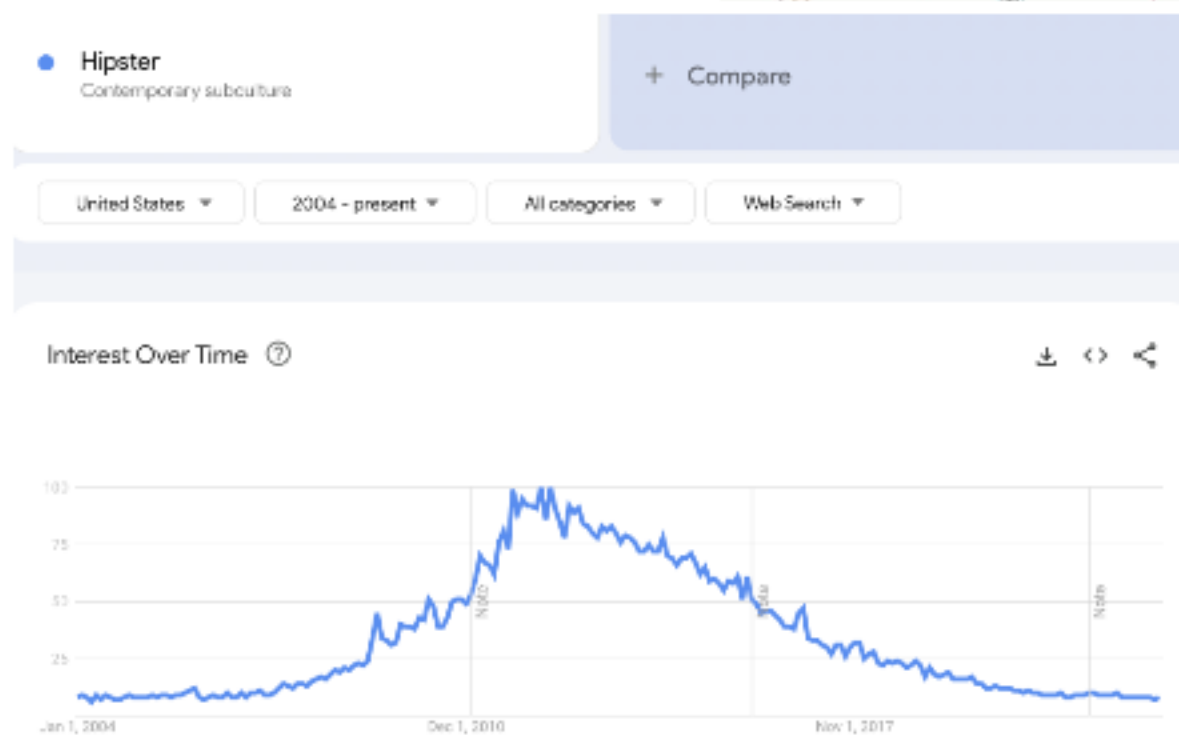
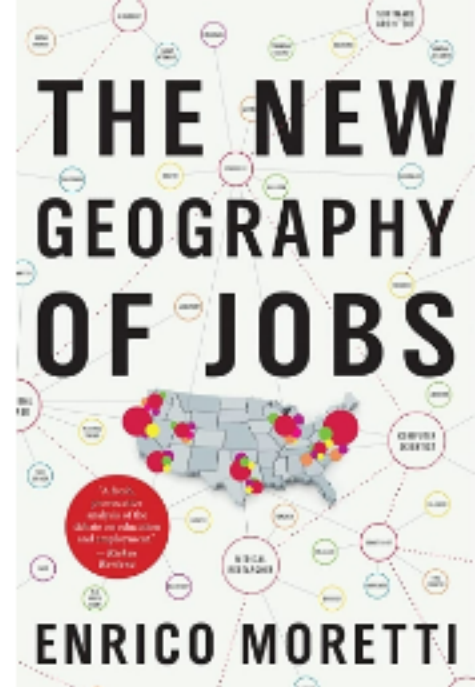


# 2010 – 2015: Unique Period of Domestic In-Migration to Superstar Cities

**Figure 3. Annual net domestic migration, international migration, and natural increase, 2010 to 2021. Metropolitan and non-metropolitan areas.**

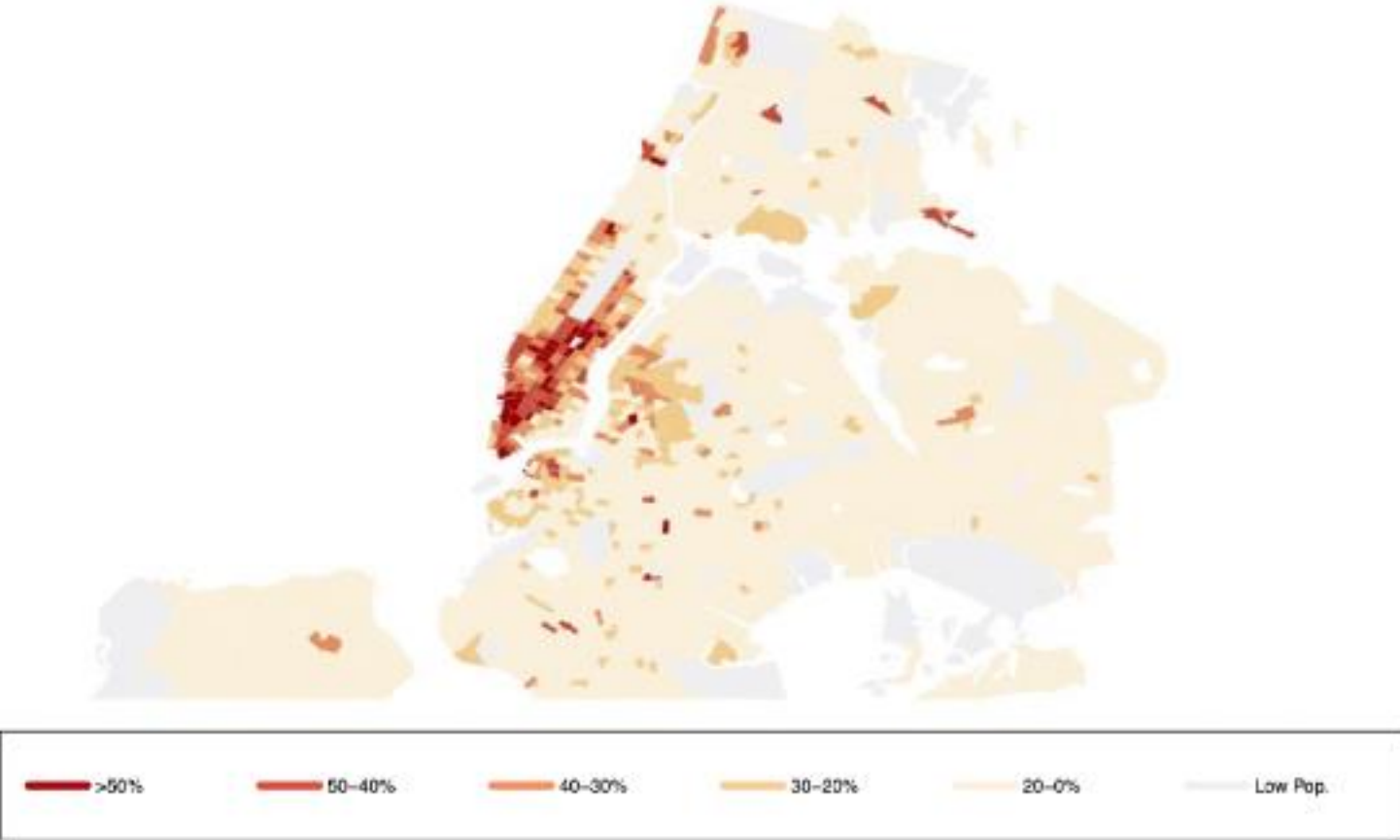


Source: William H. Frey analysis of US Census Bureau estimates released March 24, 2022

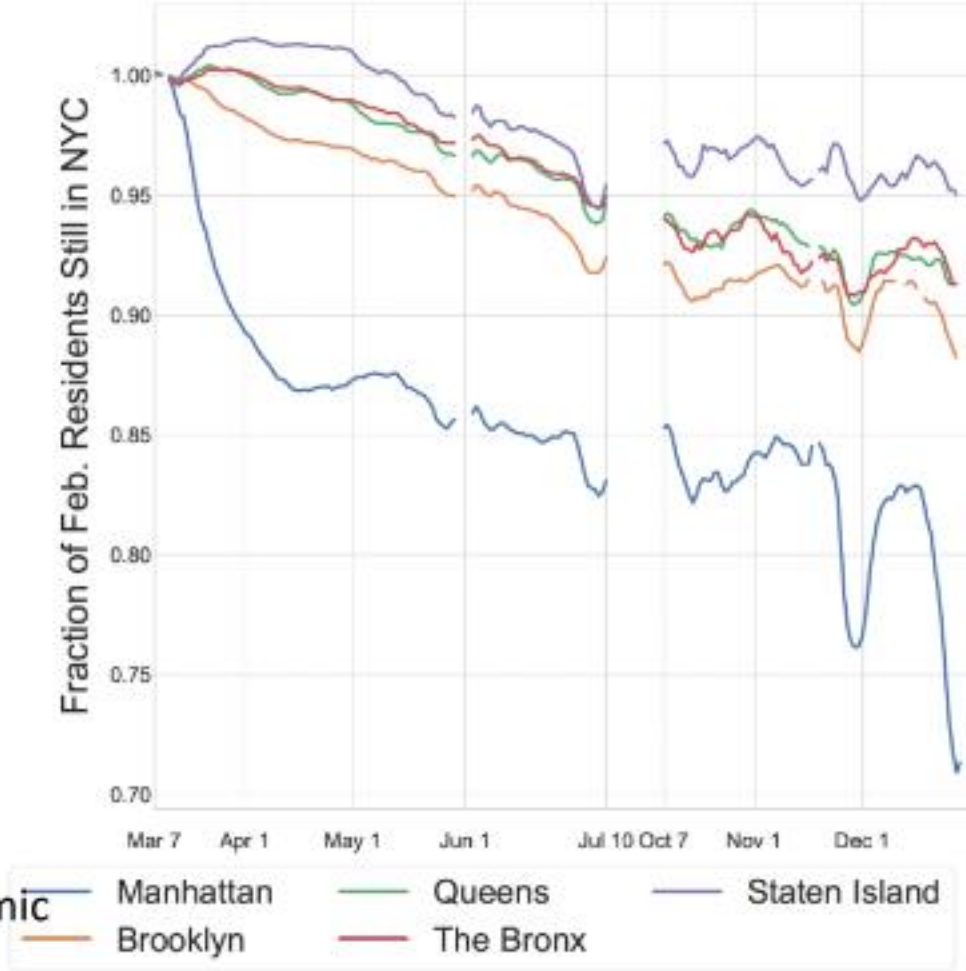


# Pandemic saw Urban Exodus

## New York City



Panel A: Propensity to Leave NYC by Borough (County)



Josh Coven, Arpit Gupta, Iris Yao. "Urban Flight Seeded the Covid-19 Pandemic Across the United States." *Journal of Urban Economics: Insights*.

# Half of the Population Flight from Decades of De-industrialization happened in Two Years of Remote Work

## Top 10 U.S. Counties in Population Change, 2020-2022

Growth Counties	2020-22 Gain	Declining Counties	2020-22 Loss
1. Kaufman County, TX	18.6%	1. San Francisco, CA	-7.5%
2. Comal County, TX	14.3%	2. Calcasieu Parish, LA	-6.6%
3. Rockwall County, TX	14.3%	3. Bronx County, NY	-6.3%
4. St. Johns County, FL	12.2%	4. New York County, NY	-5.8%
5. Brunswick County, NC	12.0%	5. Kings County, NY	-5.3%
6. Parker County, TX	11.9%	6. Queens County, NY	-5.3%
7. Sumter County, FL	11.7%	7. St. Louis City, MO	-5.0%
8. Hays County, TX	11.7%	8. San Mateo County, CA	-4.6%
9. Liberty County, TX	11.3%	9. Hinds County, MS	-4.4%
10. Ellis County, TX	10.3%	10. Terrebonne Parish LA	-4.4%

# Rising Net Domestic Outmigration is seen Across Large US Urban Areas

## Components of population change for large urban counties

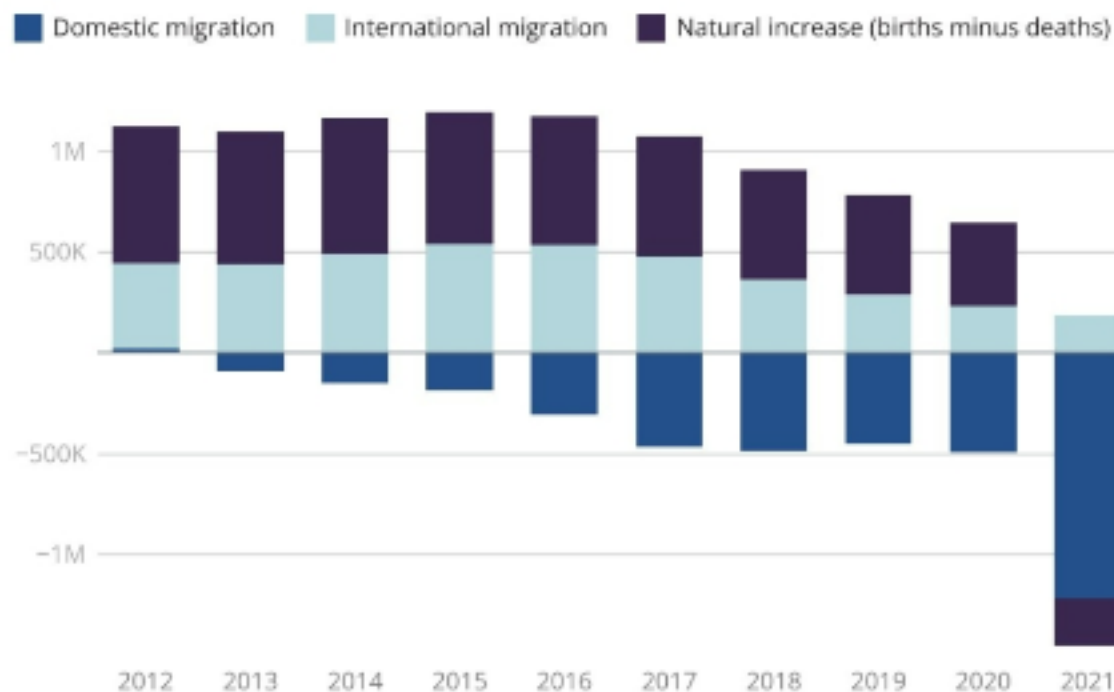
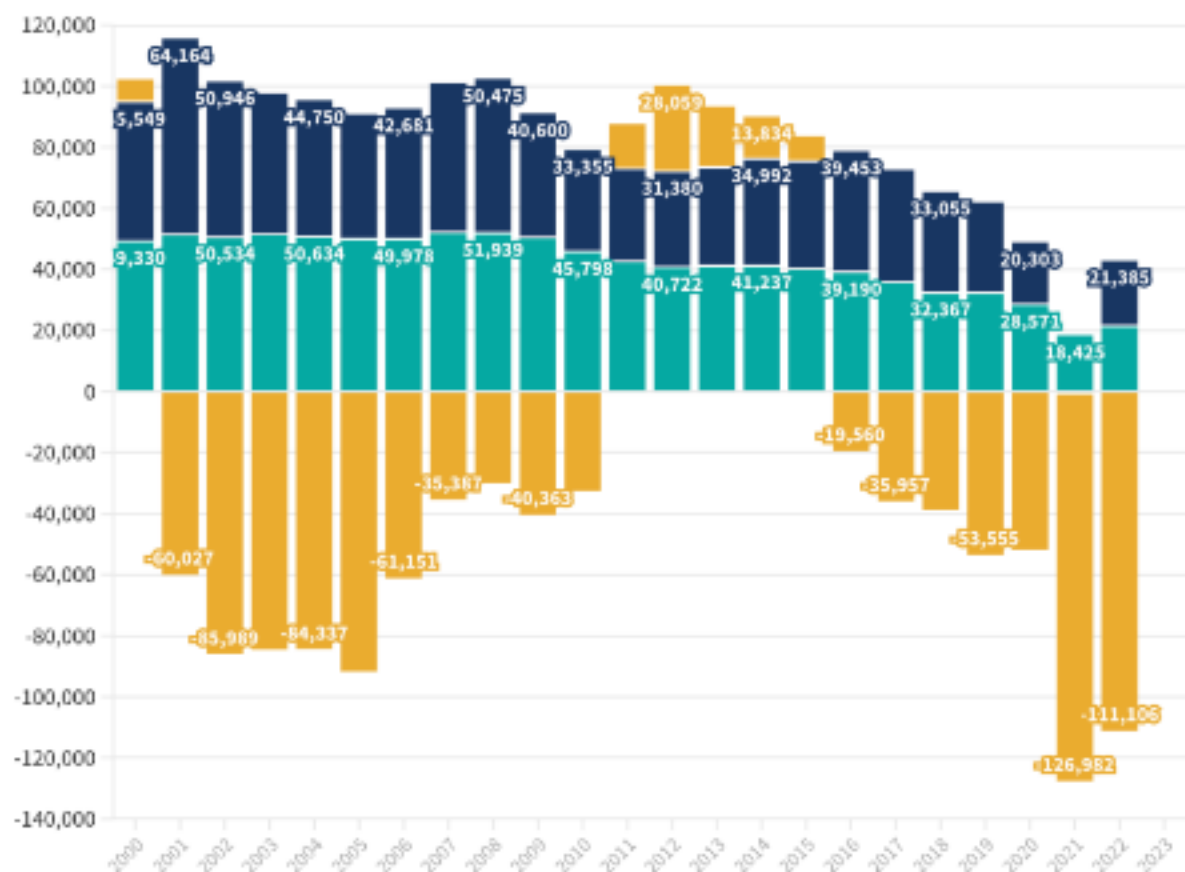


Chart: Economic Innovation Group • Source: Census Population Estimates



## Bay Area components of population change, 2000 - 2022

Legend: Natural Increase (Births - Deaths), Net Foreign Migration, Net Domestic Migration



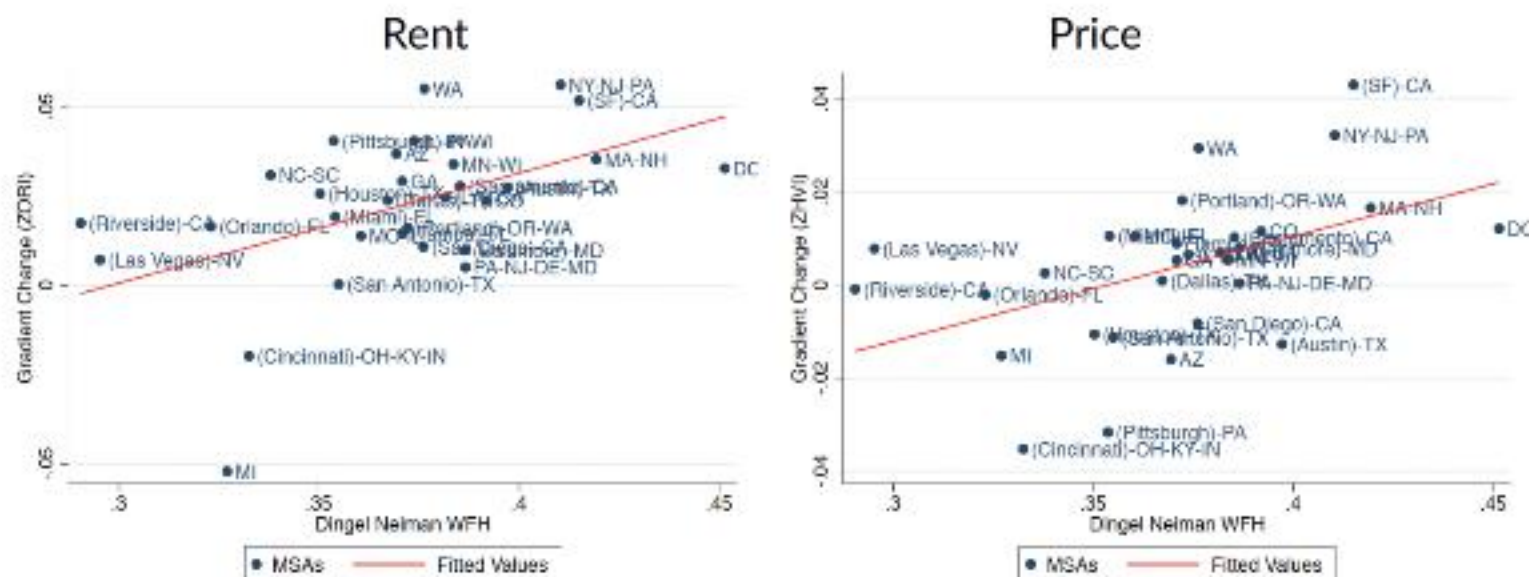
Source: CA Department of Finance • Analysis: Bay Area Council Economic Institute



# Residential Real Estate

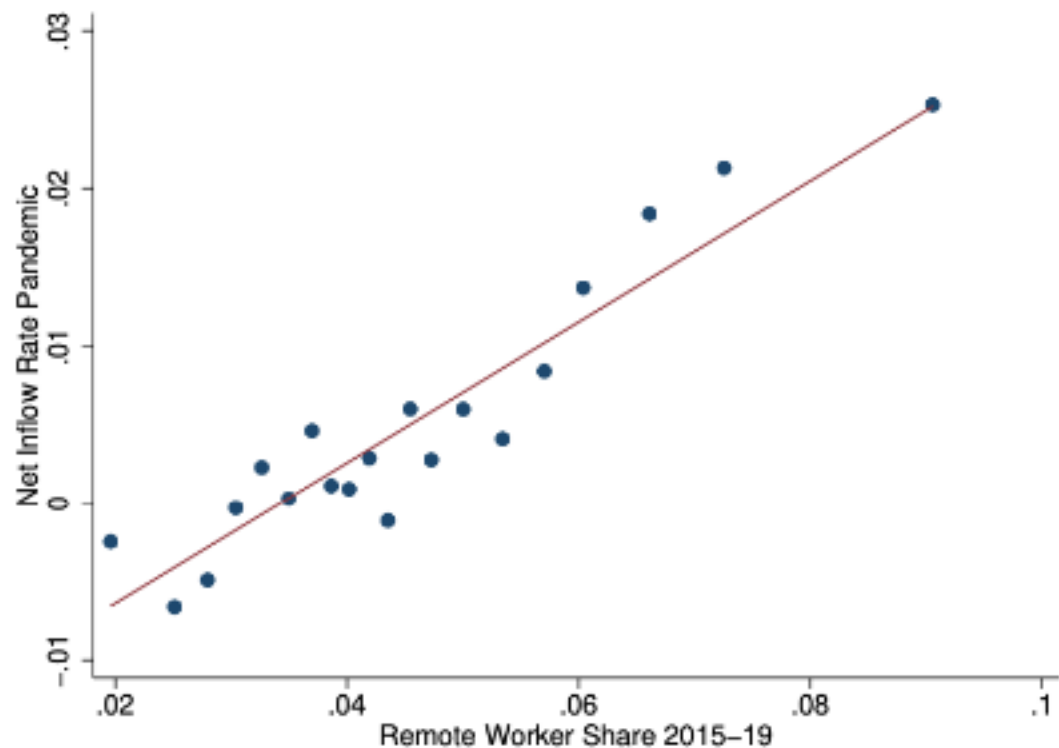


- From Dec 2019 – Dec 2020: Change in NYC Price and Rent Gradients (ie, relationship between distance to center of city and prices/rents)
- Values increase in suburbs and declined in urban core
- Across cities: change in gradient associated with extent of **remote work**

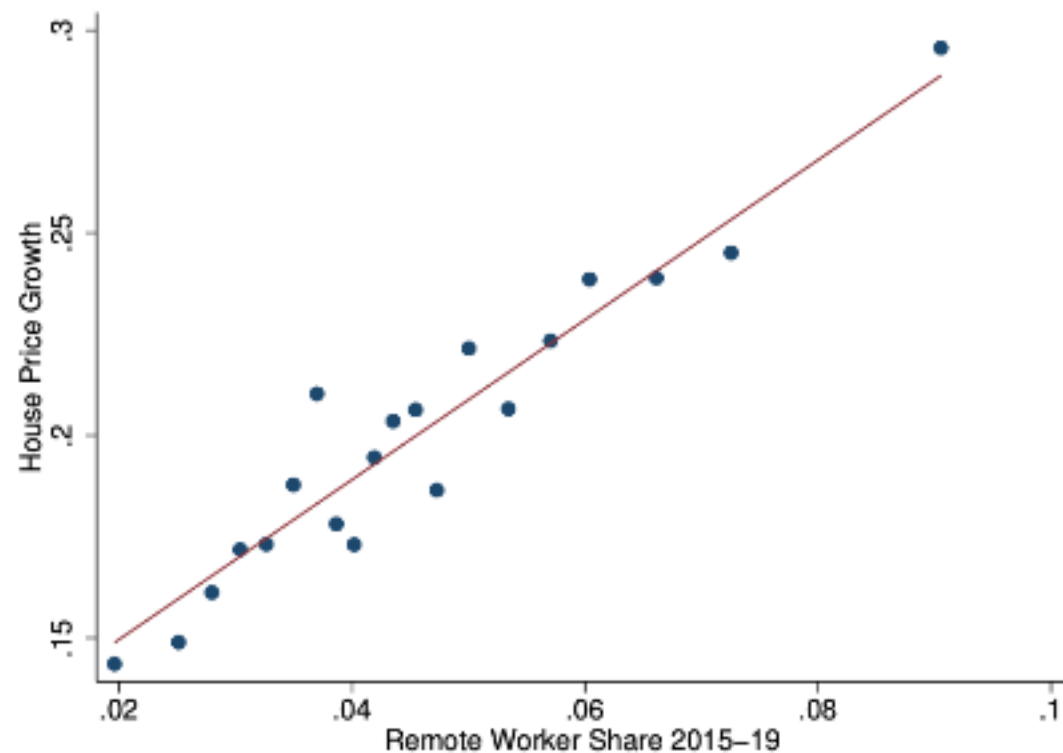


Gupta, Arpit, Vrinda Mittal, Jonas Peeters, and Stijn Van Nieuwerburgh. "Flattening the curve: pandemic-induced revaluation of urban real estate" *Journal of Financial Economics*. 2022

# Remote Workers Drove Price Growth



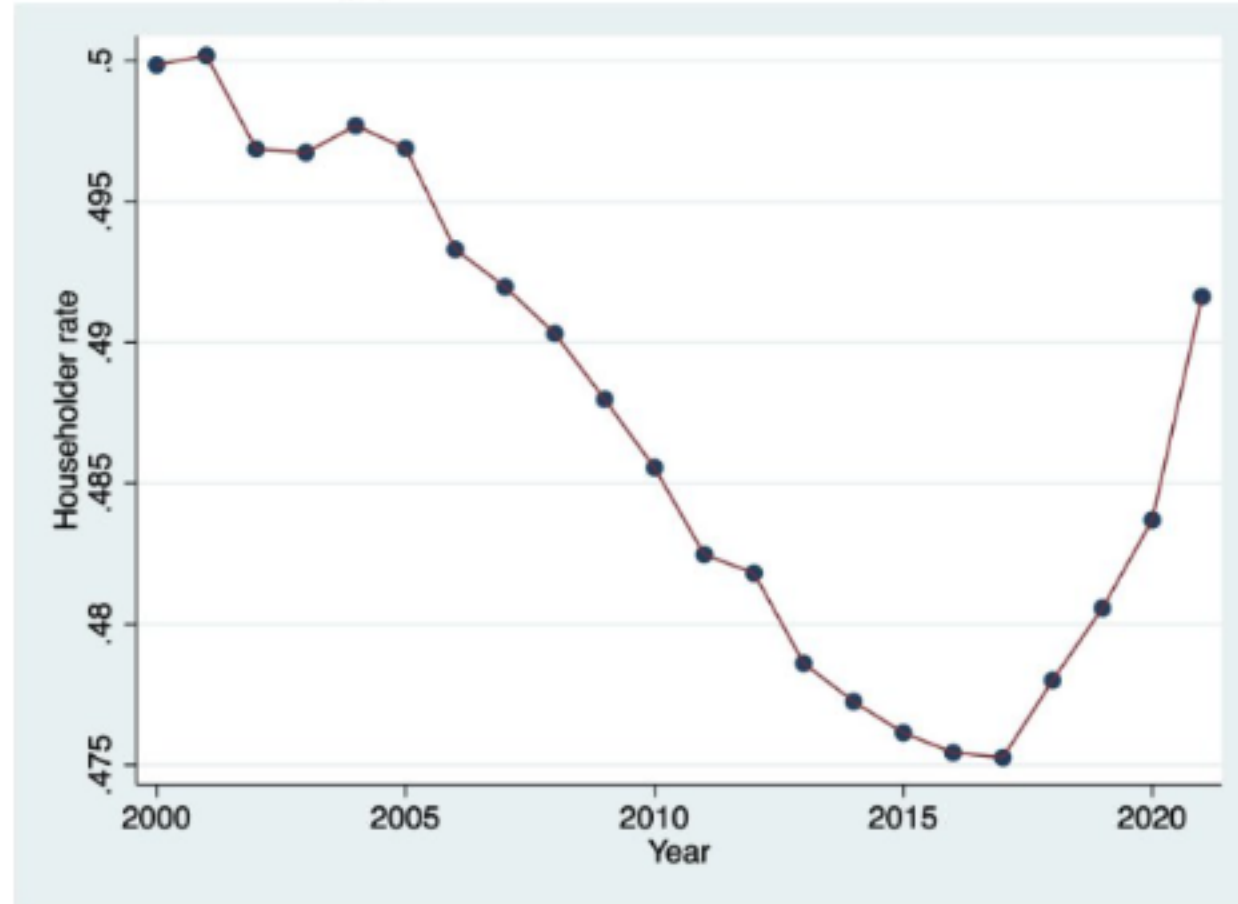
A. House Price Growth from Dec. 2019 - Nov. 2021



John Mondragon and Johannes Wieland  
"Housing Demand and Remote Work" 2022.

# Prices and Rents go up, Despite Urban Flight

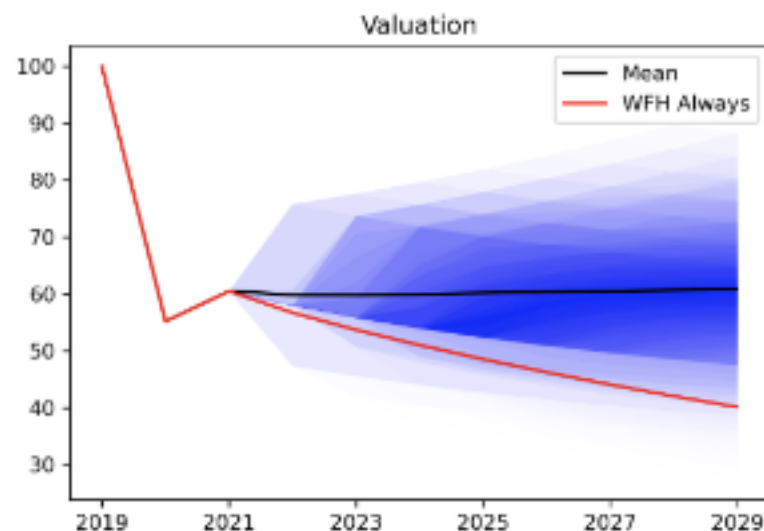
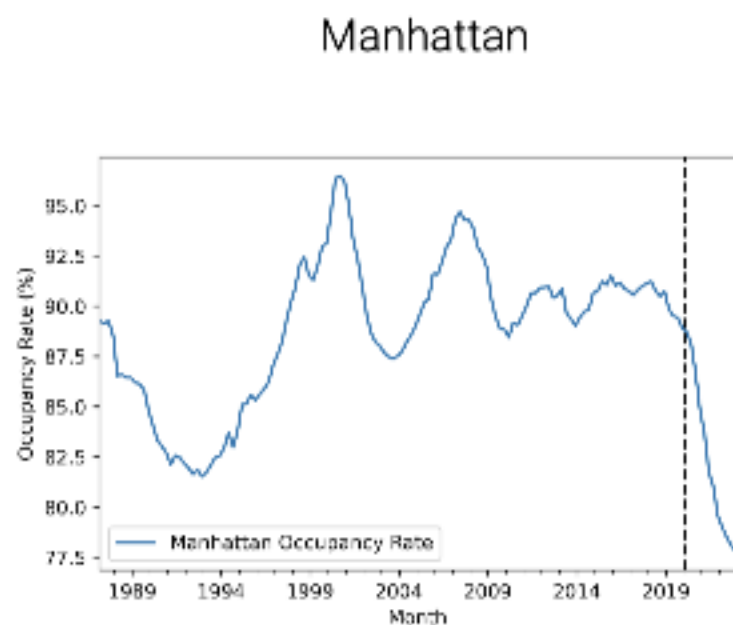
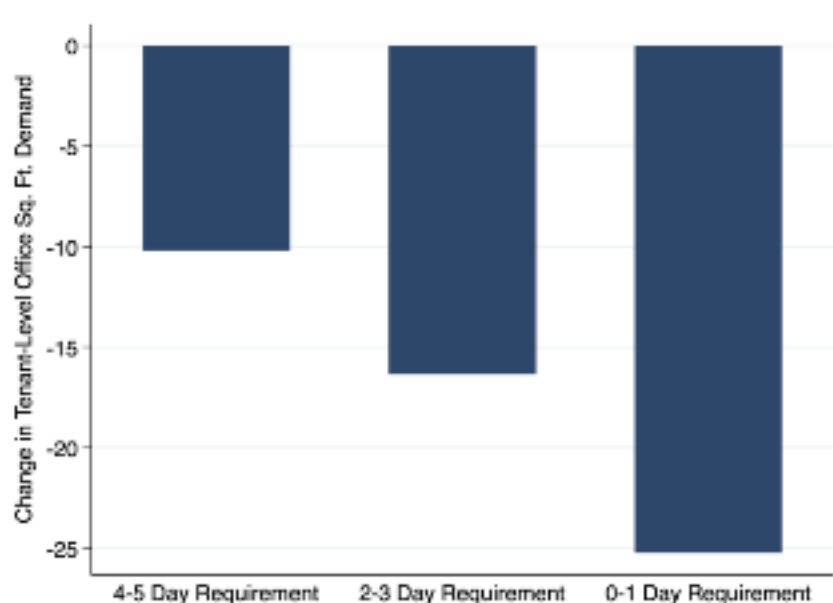
Higher housing demand and household formation



(b) Annual householder rate Adam Ozimek and Eric Carlson "Remote Work and Household Formation" 2023.

# “Apocalypse” for Office Real Estate?

Record office vacancy driven by remote work; 40-50% decline in valuation; largest drops for B/C class offices

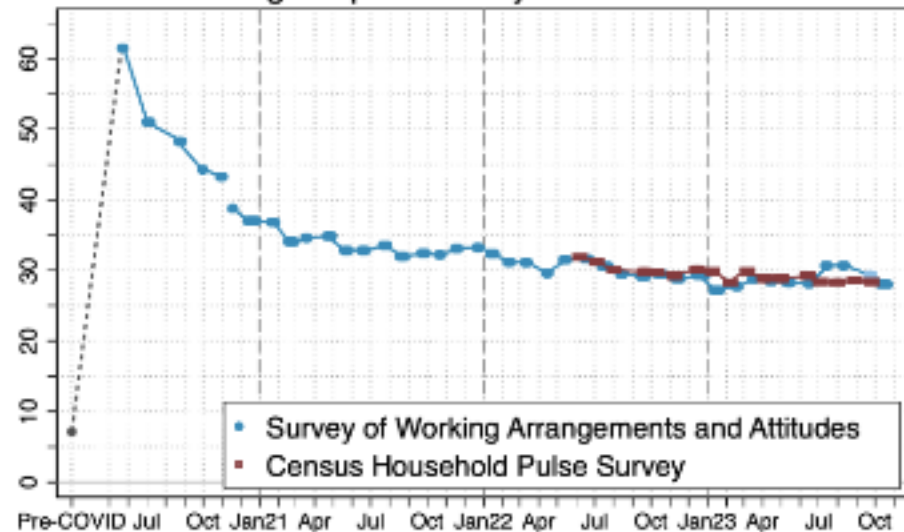


Arpit Gupta, Vrinda Mittal, Stijn Van Nieuwerburgh. “Work From Home and the Office Real Estate Apocalypse.” Working Paper. 2023.

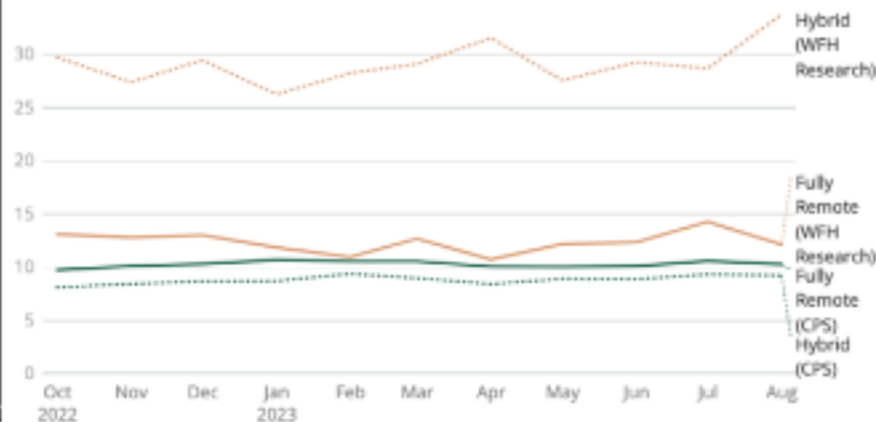
# Remote Work Seems Here to Stay

... Though debate over exactly how prevalent it is even now

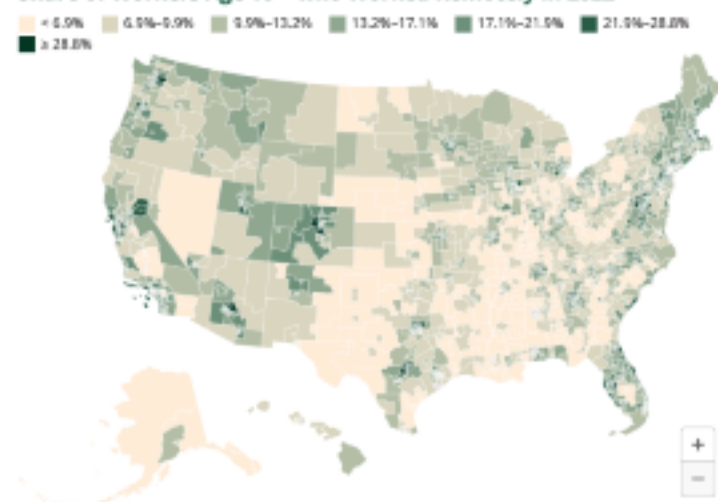
Percentage of paid full days worked from home



Gap Between CPS and WFH Research Estimates of Hybrid Work Shares



Share of Workers Age 16 + who Worked Remotely in 2022

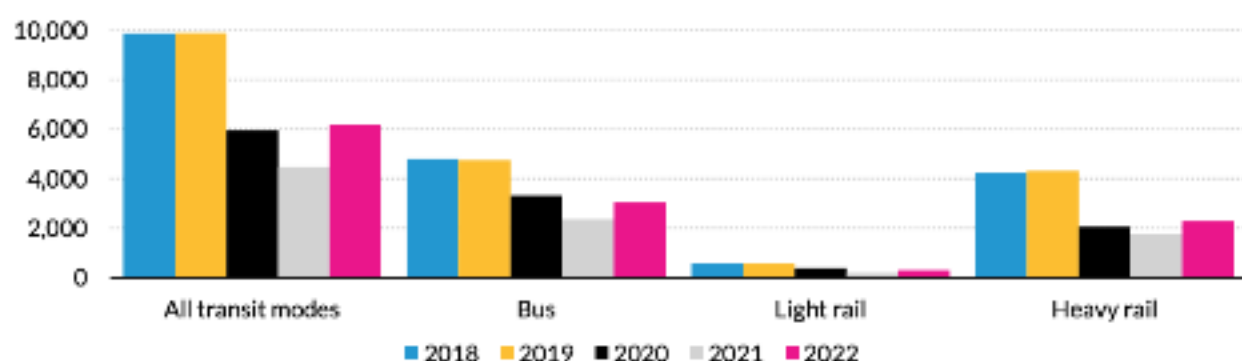


# Transit Systems Hit Nationwide

FIGURE 9

Ridership by Mode Immediately Preceding and during the First Two Years of the Pandemic

Nationwide transit trips by mode in millions, United States

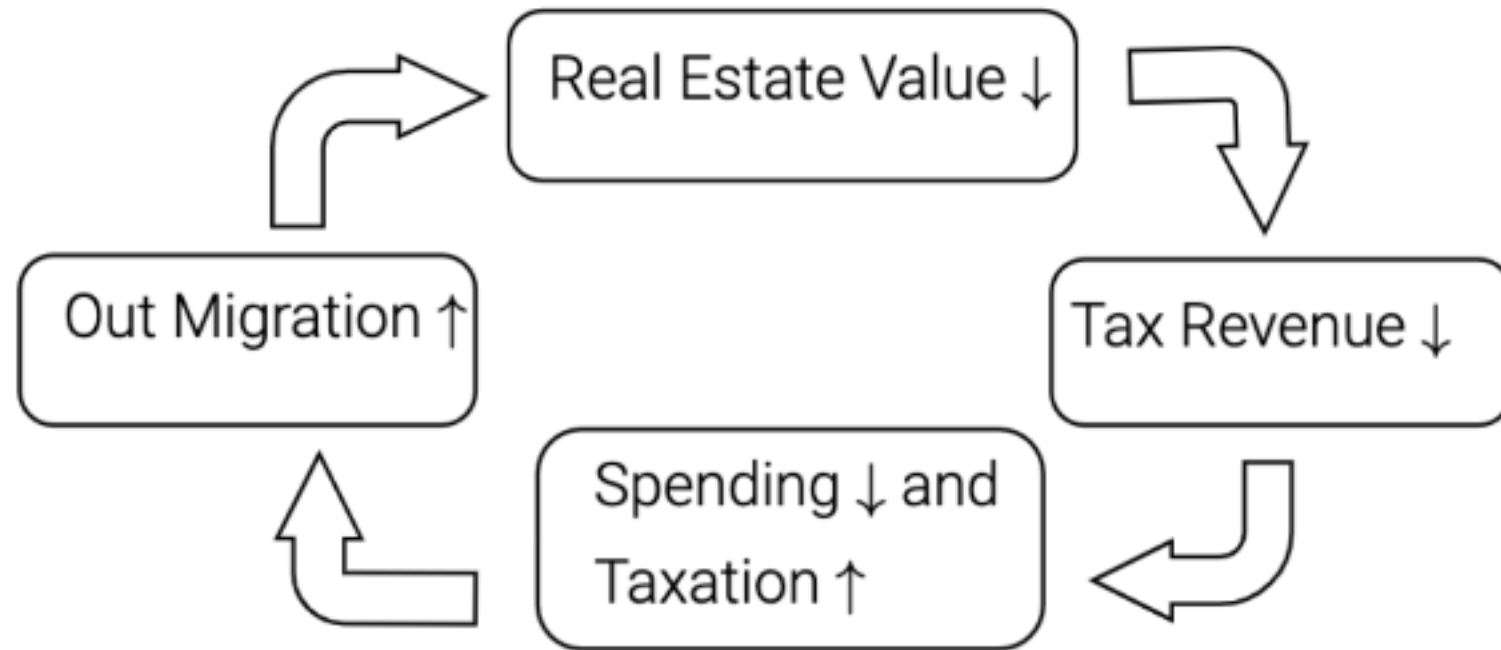


## Recovery of mass transit ridership

	Recovery vs 2019	Transit Authorities
1 Miami	100%	Miami-Dade Transit Agency
2 Houston	82%	Metro Tr Auth of Harris Co
3 Boise	82%	Valley Regional Transit
4 Salt Lake City	80%	Utah Transit Authority
5 Austin	78%	Capital Metropolitan Trp Auth
6 Los Angeles	76%	Access Services, Los Angeles County MTA, Southern California RRA
7 San Jose	75%	Santa Clara Valley Trp Auth
<b>8 NYC</b>	<b>73%</b>	<b>MTA Bus Company, MTA Long Island Rail Road, MTA Metro-North Railroad, MTA New York City Transit, MTA Staten Island Railway, New York City DOT</b>
9 Dallas	72%	Dallas Area Rapid Transit, Trinity Railway Express
10 San Antonio	69%	VIA Metropolitan Transit
11 Washington DC	68%	District Dept of Transp, Washington Metro Area TA
12 Seattle	67%	King County Dept of Trp, Sound Transit, Washington State Ferries
13 Boston	65%	Massachusetts Bay Tr Auth
14 Philadelphia	60%	Southeastern Penn TA
15 Denver	59%	Regional Trp District
16 Chicago	58%	Chicago Transit Authority, Metra
17 Atlanta	58%	Atlanta-Region Transit Link Authorit, Metro Atlanta Rapid Tr
18 Phoenix	57%	City of Phoenix PTD, Valley Metro, Valley Metro Rail, Inc.
19 San Francisco	55%	Golden Gate Bridge, Hwy & TD, San Francisco Bay Area RTD, San Francisco Muni Rwy
20 Raleigh	50%	GoRaleigh
21 Charlotte	48%	Charlotte Area Transit
22 Detroit	48%	City of Detroit Dept of Trp, Detroit Transp Corp/DPM

Source: APTA, individual transit reports, JPW/M, Q2 2023.

# Urban Doom Loop



- Remote work shock to office hits property taxes and associated businesses (commuting, retail, crime increases, etc.)
  - SF: \$1.2 billion-plus budget deficit forecast in 2027-28; decline in tax revenue from commercial real estate
- Resulting adjustments in taxing/spending may further drive out-migration in negative spiral

# How a 'Golden Era for Large Cities' Might Be Turning Into an 'Urban Doom Loop'

Nov. 30, 2022

## The 'urban doom loop' threatening American cities like New York and San Francisco, explained

PUBLISHED FRI, OCT 6 2023 • 2:31 PM EDT



Kate Sammer

SHARE

## Can San Francisco Save Itself From the Doom Loop?

The city is racing to come up with solutions for its downtown, hollowed out by a tech exodus and struggling with homelessness and street crime

By [Jim Carlton](#) [Follow](#) and [Katherine Bindley](#) [Follow](#) | Photographs by *Michaela Vatcheva*  
for *The Wall Street Journal*

Updated Aug. 13, 2023 12:00 am ET



# Many Cities have Recovered from Immediate Pandemic Shocks

But job growth, transit, crime, population loss, and (future) fiscal pressures remain challenges

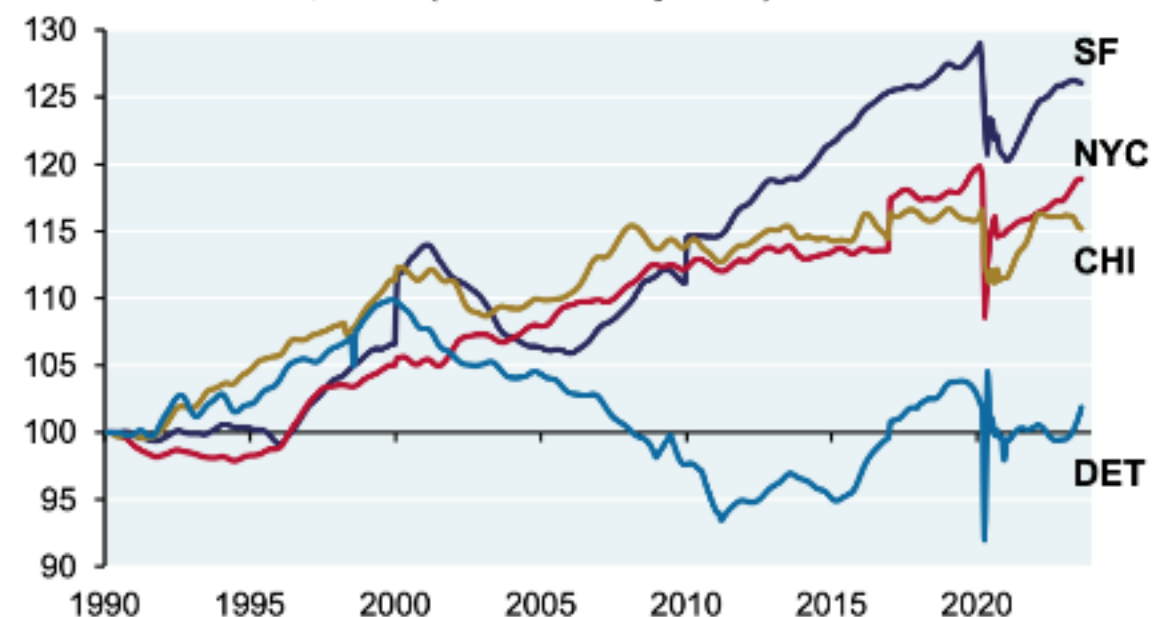
High frequency measures: NYC post-COVID recovery generally above median with the exception of net population out-migration

City (MSA)	Downtown recovery	Transit recovery	Major airport recovery	Office vacancy	Industrial vacancy	Residential vacancy	Annual net migration	Violent crime per 100k	Property crime per 100k
Atlanta	58%	58%	96%	25%	4.8%	8.7%	-0.4%	894	3,874
Austin	53%	78%	124%	21%	8.0%	8.1%	-0.3%	491	3,343
Boise		82%	113%	11%	6.1%		0.8%	297	1,344
Boston	48%	85%	94%	19%	4.9%	2.9%	-1.7%	551	1,848
Charlotte	63%	48%	107%	18%	5.5%	5.9%	1.4%	782	3,139
Chicago	52%	58%	90%	22%	4.4%	5.4%	-1.9%	953	2,983
Dallas	68%	72%	109%	20%	7.7%	8.2%	-1.2%	625	3,421
Denver	56%	69%	108%	26%	6.5%	6.4%	-0.3%	932	5,780
Detroit	57%	48%	82%	20%	3.7%	8.7%	-0.8%	2,154	3,356
Houston	57%	82%	96%	25%	6.3%	9.9%	-0.5%	1,211	4,106
Los Angeles	63%	76%	87%	21%	4.0%	3.7%	-1.1%	722	2,148
Miami	63%	100%	114%	14%	2.4%	6.0%	-0.6%	556	2,750
NYC	67%	73%	101%	18%	5.3%	4.1%	-1.8%	578	1,558
Philadelphia	46%	60%	86%	16%	6.3%	6.6%	-0.5%	909	3,097
Phoenix	72%	67%	105%	22%	6.5%	9.2%	-0.7%	798	2,989
Raleigh	44%	56%	101%	17%	5.0%	8.3%	0.4%	484	2,137
Salt Lake City	139%	80%	101%	14%	5.6%	5.2%	-0.9%	969	6,841
San Antonio	67%	65%	104%	20%	5.7%	5.5%	0.1%	683	3,814
San Francisco	32%	55%	85%	28%	9.0%	6.9%	-2.5%	544	4,394
San Jose	74%	75%	73%	21%	6.6%	3.2%	-1.0%	425	2,316
Seattle	48%	67%	100%	21%	5.7%	3.8%	0.2%	745	5,102
Washington DC	76%	68%	100%	22%	4.4%	5.9%	-0.9%	858	3,431

Source: University of Toronto, compilation of transit and airport authority data, GoStar, Census, FBI, BUREAU OF ECONOMIC ANALYSIS. Office vacancy includes pending vacancy. 2023

## Detroit's decline in context

Size of labor force, index (100 = January 1990)



# Banking Doom Loop

Largest Impact to be Felt on Maturing Office Loans held by Midsized/Regional Banks

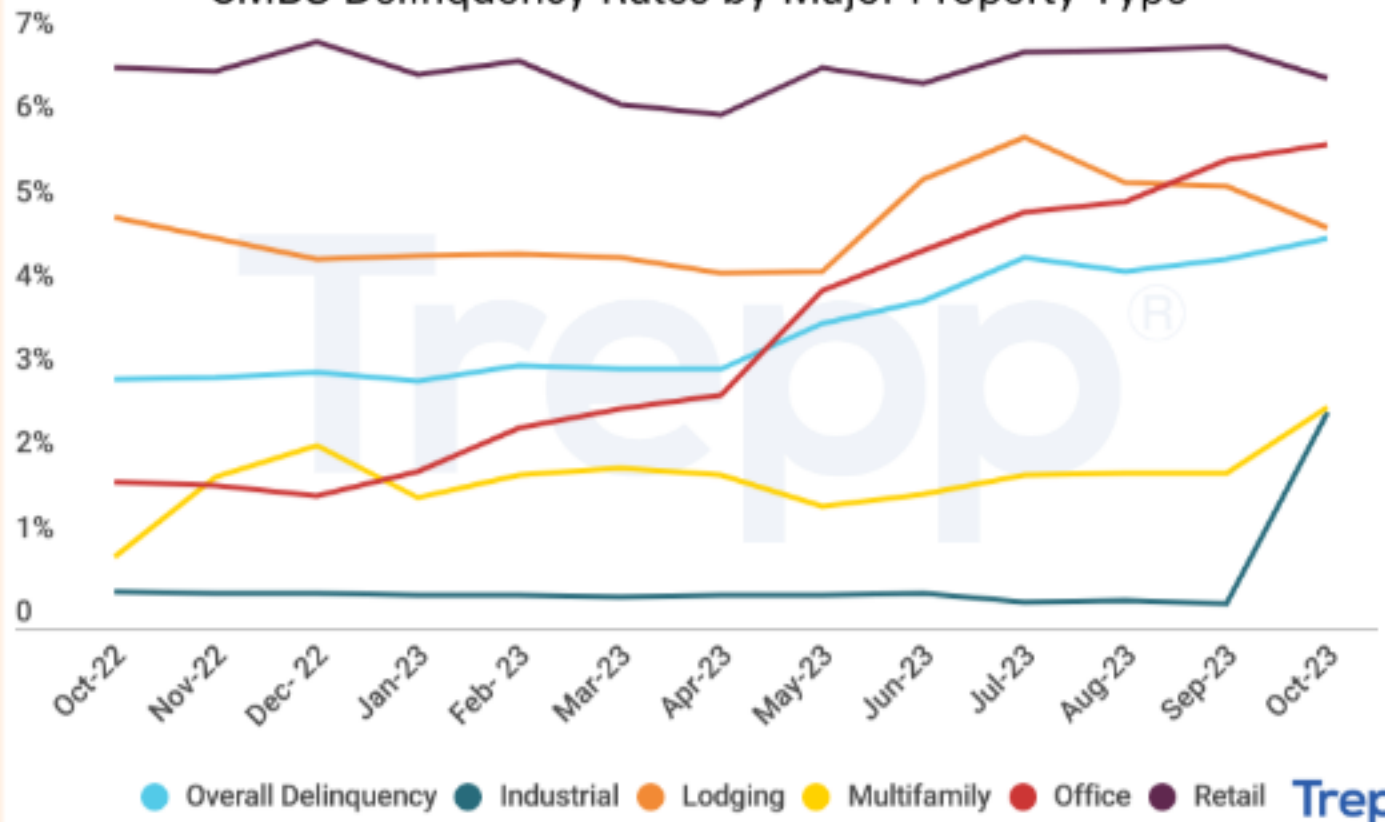
“It’s not a hiccup — it’s not Covid and then recover,” said Leo Huang, the head of commercial real estate debt at Ellington Management Group, an asset manager. “Property prices are going to come down and loan delinquencies are going to keep going up.”

## Delinquent commercial real estate loans hit highest level in a decade

CRE delinquencies of non-owner occupied property loans (\$bn)



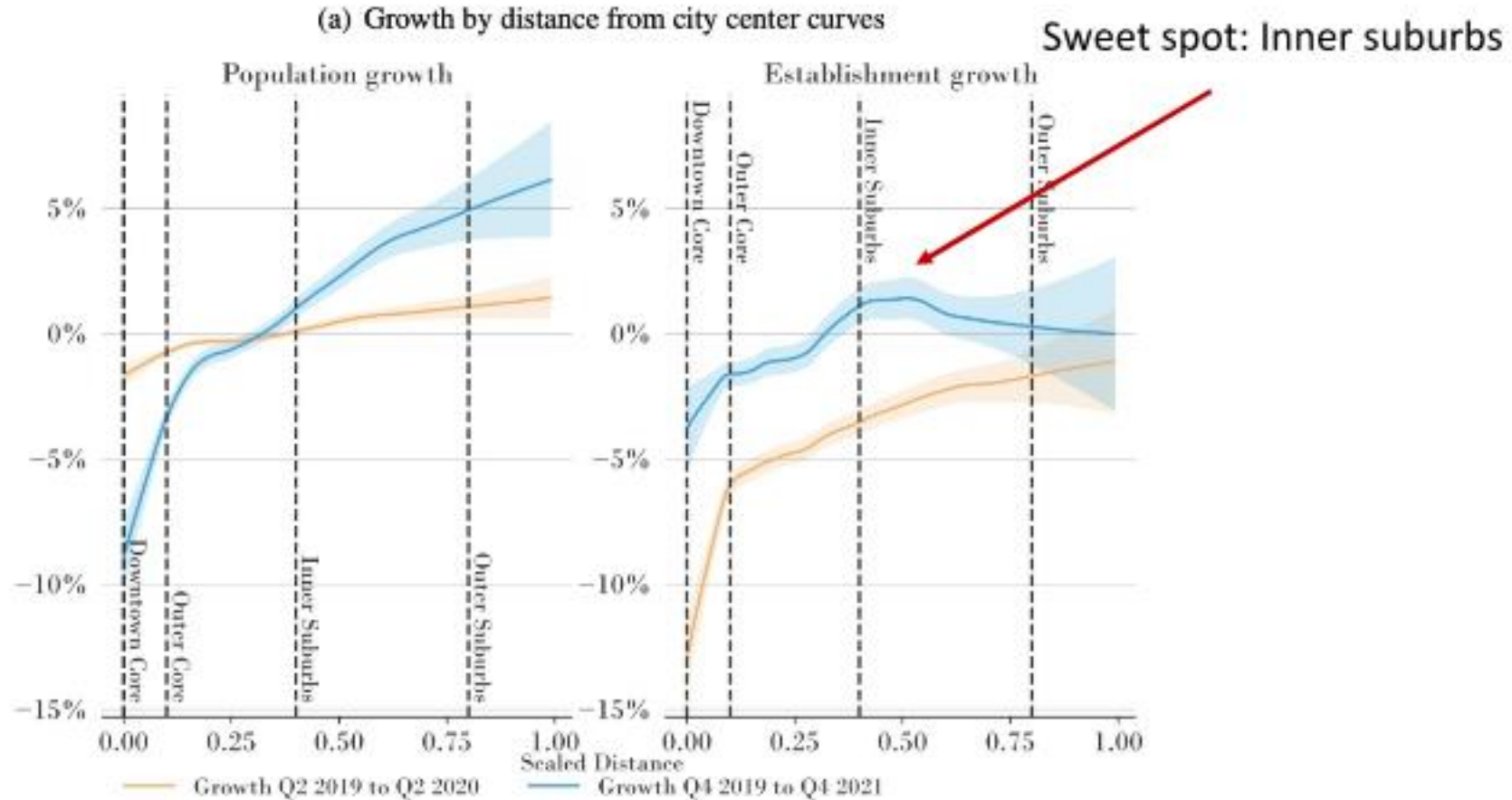
## CMBS Delinquency Rates by Major Property Type



● Overall Delinquency ● Industrial ● Lodging ● Multifamily ● Office ● Retail Trepp

# Boom Loop for Suburban Locations

Positive Feedback Loops of Population <> Business

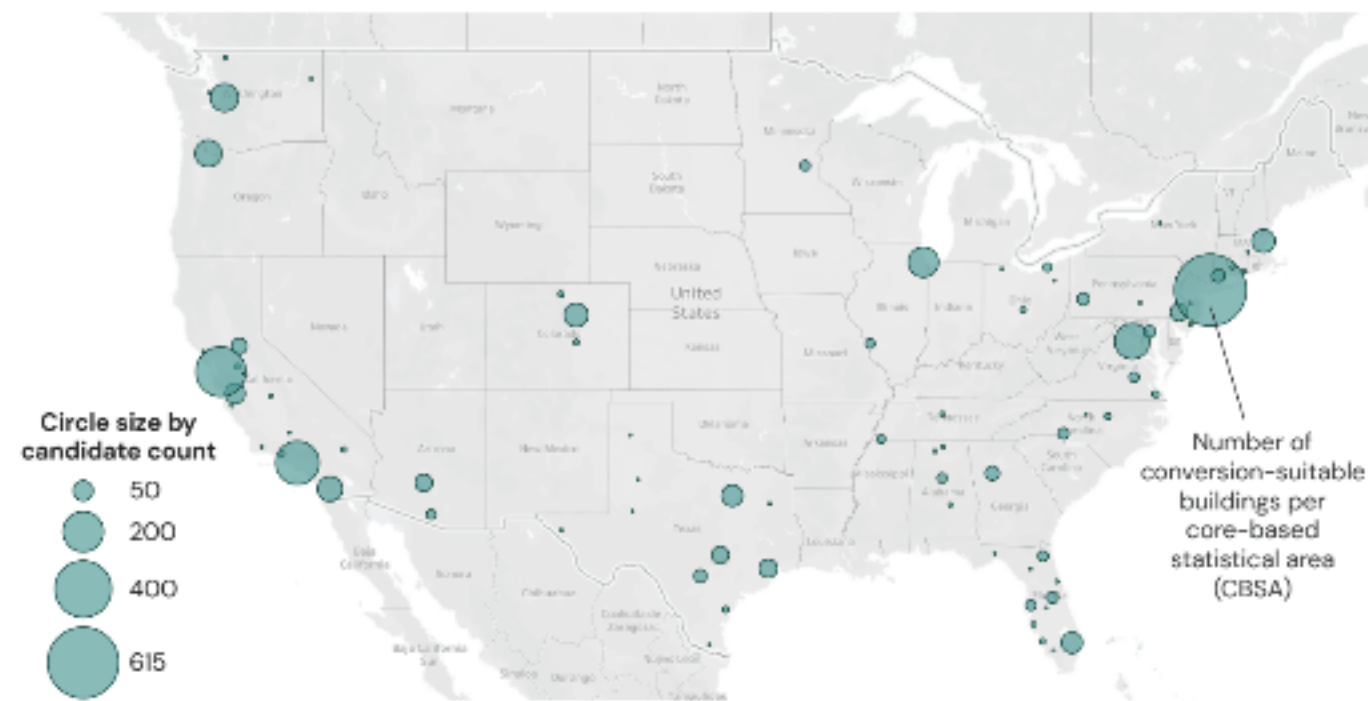


James Duguid, Bryan Kim, Lindsay Relihan, and Chris Wheat. "The Impact of Work-from-Home on Brick-and-Mortar Retail Establishments: Evidence from Card Transactions." 2023.

# Strategies to Address: Office to Residential Conversions?

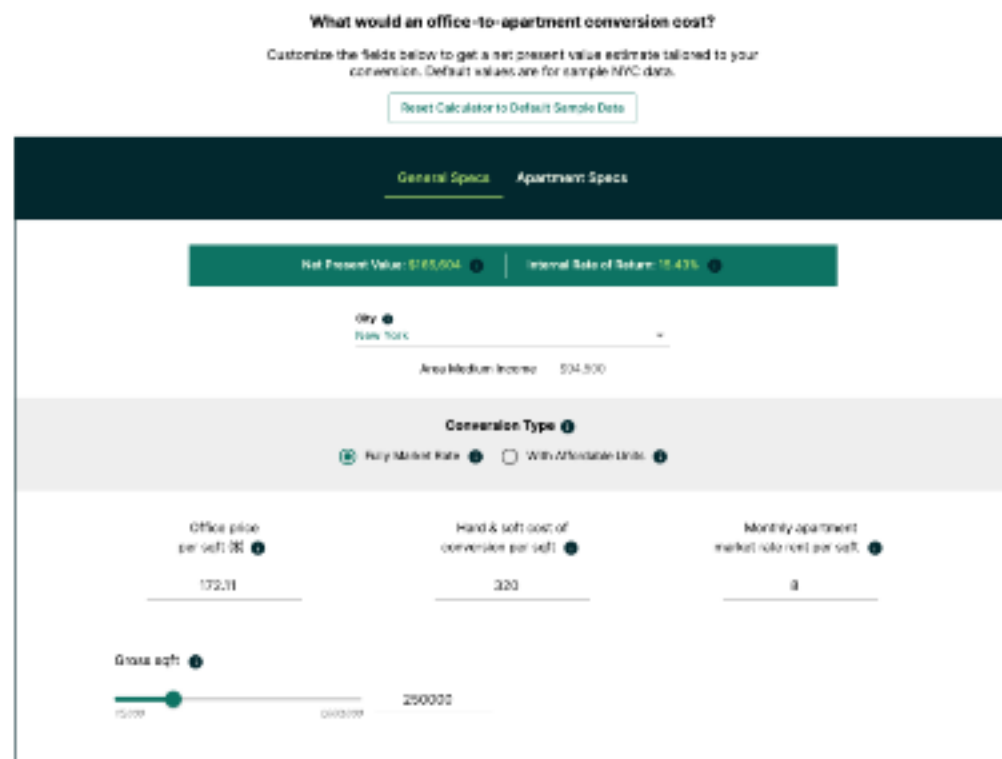
5% of office buildings can be physically and financially converted; yielding 367,750 apt units

## National candidates



Source: CompStak; authors' calculations.

THE HAMILTON PROJECT  
BROOKINGS



Arpit Gupta, Candy Martinez, Stijn Van Nieuwerburgh. "Converting brown offices to green apartments." Brookings Institute. 2023. <https://www.brookings.edu/articles/converting-brown-offices-to-green-apartments/>

# Governing for a Remote Working Future

- Remote work is here to stay
  - Boosting demand for suburban residential real estate and businesses
  - Negative Impact on urban locations:
    - Population loss
    - Loss in office values
    - Mass transit shocks
    - Broader losses to urban dynamism in retail, foot traffic, crime, etc.
    - Implications of office loan defaults and property tax losses will take many years to play out
- Reorienting cities around *people* and *consumption* rather than office work is the future

# Thanks!

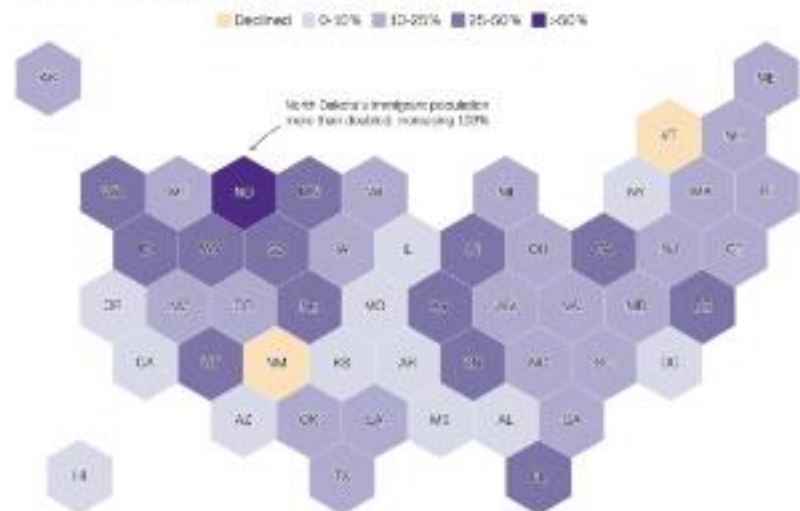
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# Appendix

# Foreign Immigrants Increasingly Headed to Same Sunbelt Locations as Domestic Migrants

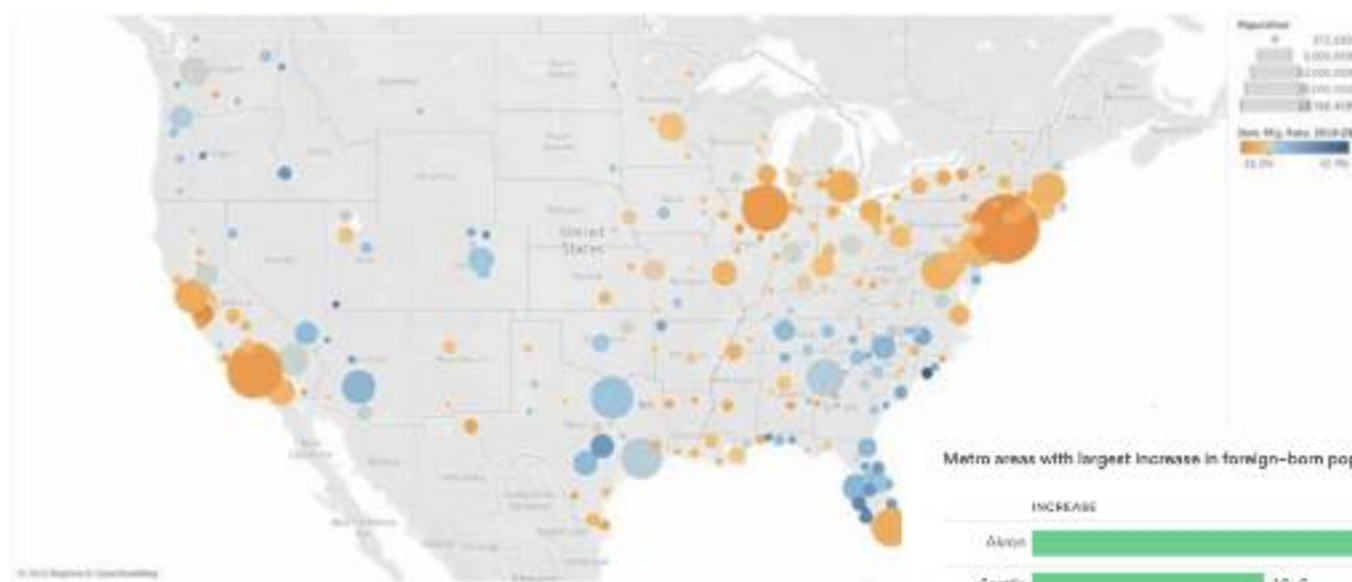
## Most states' immigrant populations have grown since 2010

North Dakota, Delaware, South Dakota and Idaho have seen the greatest increases in their immigrant populations since 2010. Immigrant populations decreased in Vermont and New Mexico.



Source: Migration Policy Institute analysis of 2017 American Community Survey data. Graphic: Catherine C. Schaefer, CHS. Mapping: Toposplus.com

## Net Inbound Domestic Migration Rates for Foreign-Born People, 2010–2020: 250 Largest Metros



### Metro areas with largest increase in foreign-born population, from 2014 to 2017

INCREASE	TOTAL POPULATION	FOREIGN BORN
Alton 30.0%	703k	5
Seattle 19.0	3.9m	18
Tempe 17.8	9.1m	1
Omaha 17.4	912k	7
Indianapolis 16.9	2.0m	7
Raleigh 16.6	1.3m	1
Charlotte 16.2	2.5m	1
Jacksonville 15.1	1.5m	1
Orlando 14.9	2.5m	1
Fort Myers 14.0	739k	1

State Map, American Economy, Chart, News, Research



# Foreign Immigrants Heading to Suburban Destinations

Metro areas with largest increase in foreign-born population, from 2014 to 2017

	INCREASE	TOTAL POPULATION	SHARE FOREIGN BORN
Akron	30.6%	703k	5.0%
Seattle	19.0	3.9m	18.9
Tampa	17.8	3.1m	14.3
Omaha	17.4	912k	7.3
Indianapolis	16.9	2.0m	7.2
Raleigh	15.6	1.3m	12.8
Charlotte	15.2	2.5m	9.9
Jacksonville	15.1	1.5m	9.5
Orlando	14.9	2.5m	18.1
Fort Myers	14.6	739k	17.2

Data: New American Economy; Chart: Naema Ahmed/Axios

# Large Drop in School Enrollment

TABLE 1

Enrollment Changes, Population Changes, and Residuals, by State, 2019-20 to 2021-22

State	K-12 ENROLLMENT CHANGE, BY SECTOR			Change in School-Age Population (4)	Unexplained (1)+(2)+(3)-(4)
	Public (1)	Private (2)	Homeschool (3)		
CA	-270,928	9,502	14,096	-95,751	-151,579
CO	-29,095	507	2,622	-10,943	-15,023
DE	-1,529	556	1,757	688	96
DC	470	1,113	770	1,341	1,012
FL	-18,754	22,141	45,994	23,901	25,480
GA	-25,575	1,608	13,149	-1,758	-9,060
LA	-25,047	-3,253	3,572	-5,562	-19,166
MA	-35,293	10,840	5,288	-17,940	-1,225
MN	-19,380	4,314	7,100	-2,938	-5,028
MT	615	789	1,553	2,943	14
NE	-2,018	-697	4,313	-537	2,135
NH	-6,684	1,500	1,230	-2,273	-1,681
NY	-132,398	-8,269	21,401	-60,182	-59,084
NC	-34,086	11,352	11,355	693	-12,072
ND	971	110	804	1,176	709
PA	-32,694	11,974	13,868	-15,642	8,790
RI	-4,817	3,560	1,250	-2,222	2,215
SC	-3,180	608	9,863	5,450	1,841
SD	1,306	-937	2,845	1,652	1,562
TN	-14,043	18,862	2,247	4,388	2,678
WA	-37,443	14,450	11,212	-1,167	-10,614
WI	-20,911	2,217	7,758	-8,803	-2,133
<b>Total</b>	<b>-710,513</b>	<b>102,847</b>	<b>184,047</b>	<b>-183,486</b>	<b>-240,133</b>

Sources: Federal and state sources identify enrollment by sector in fall 2019 and fall 2021. The change in the school-age population is based on "Vintage 2021" estimates from the US Census Bureau.