



Yardi Matrix Fall Multifamily Overview

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Today's Agenda

- Macroeconomic Outlook
- Demand Trends
- Commercial Real Estate Fundamentals
- Technology, Demographics, Migration and Immigration



Macroeconomic Outlook

The Yardi Matrix House View- Sept 2017

We have made a consistent positive case for US Multifamily Investment for several years- but it'll be a bit bumpy ahead

- US macroeconomic conditions, while not great, are solid and generating job growth of ~175-200K jobs per month
 - Enough to maintain MF occupancy and good, but decelerating, rent growth vs 2012-2015
- MF Demand is a big tailwind, both Short and Long Term
 - Job Formation, Demographics, Affordability, and Technological change are all combining for a positive perfect storm for the next 10-20 years- -the move to urbanized suburbs is beginning in earnest
- MF Supply is coming on more slowly than expected; forecast now **300,000 vs. 360,000 units** in '17- enabling continued slow rent growth, with the peak supply pushed out to 2018 at 360,000 units
 - Supply surge delay/smoothing driven by construction labor – avg. 5 month delay- from 20 mos. in Chicago to 5 mos. in Denver
 - Tighter regulatory oversight of banks has restricted new construction financing & raised the cost via use of private lenders
 - Housing is in shortage in mid-priced apartments- and the opportunity in value add has attracted institutional capital to such an extent that leading edge players are culling and waiting to lean back into Core assets
- Oil prices are range bound- \$40-\$50/bbl. with regional pain on the slow mend - Houston, OKC, & Pittsburgh
- Major Top 40 Non-gateway markets, and their growing intellectual capital nodes, are well positioned to benefit from domestic migration and lower costs vs. gateway cities...and largely insulated from national immigration policy
 - Opportunistic or yield investors need to move to “unloved” markets away from institutional investors
 - Value Add has good odds of success, on fundamentals- but asset price change has narrowed the opportunity recently

How Do Things Look Now?

The Outlook remains positive, but guarded for the next 18-24 months as supply gets absorbed; the extent of which remains based upon the balance of pro-growth vs. immigration/trade policy emphasis

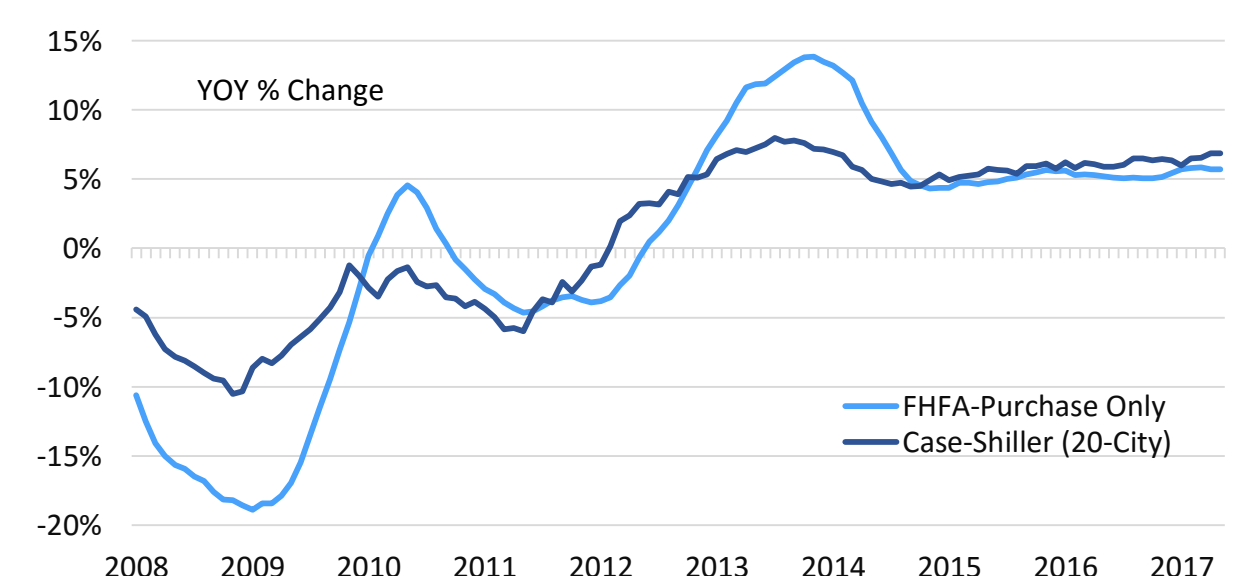
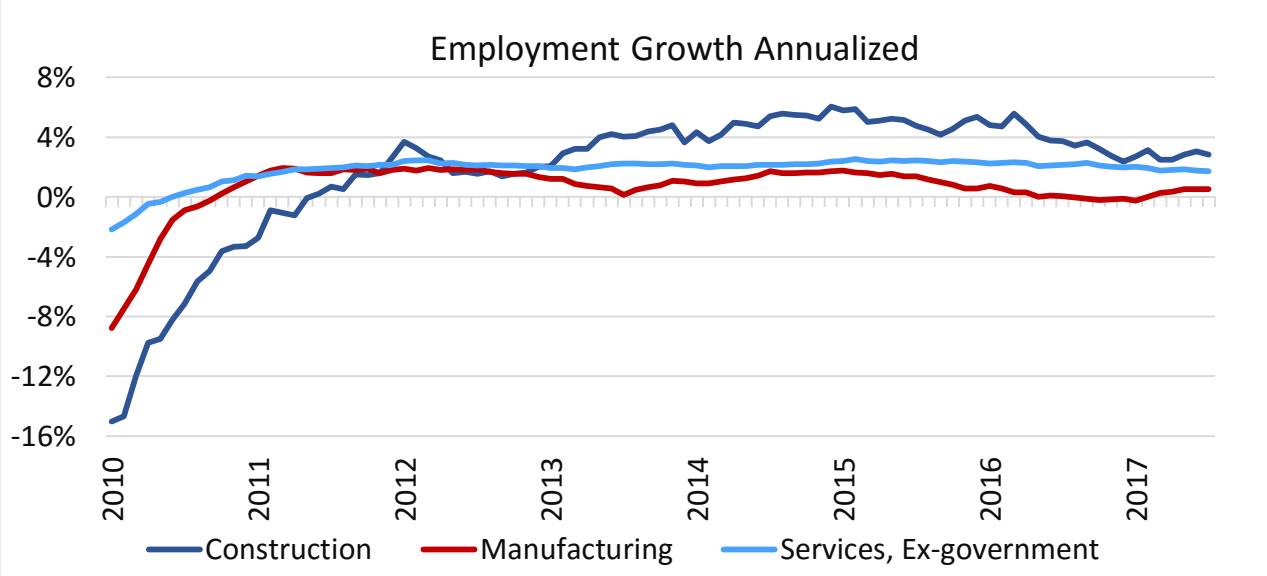
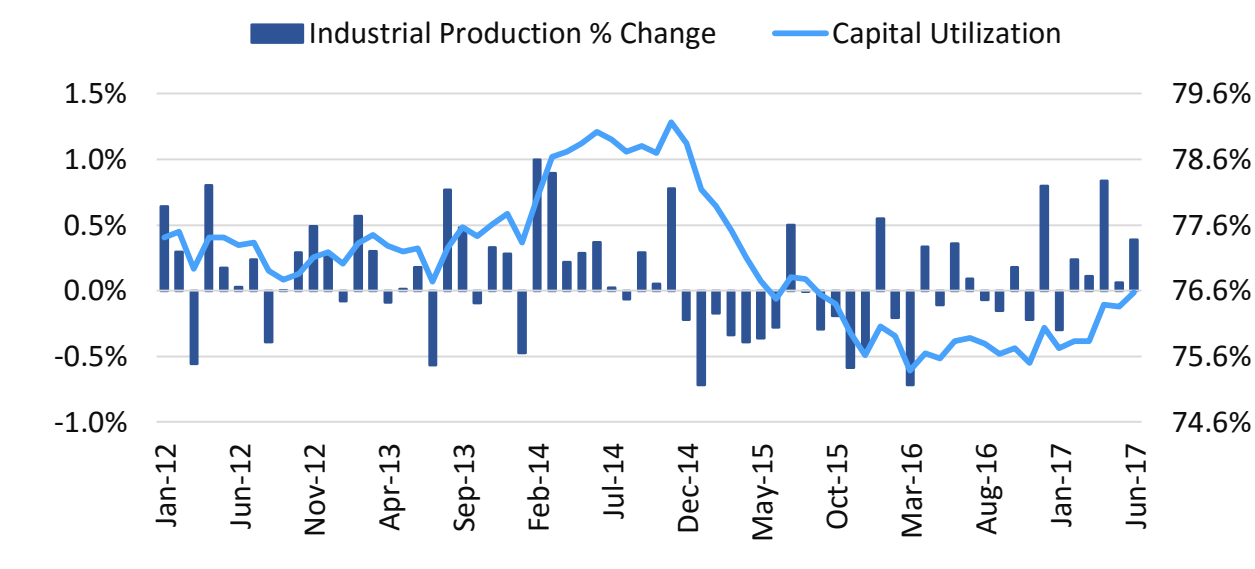
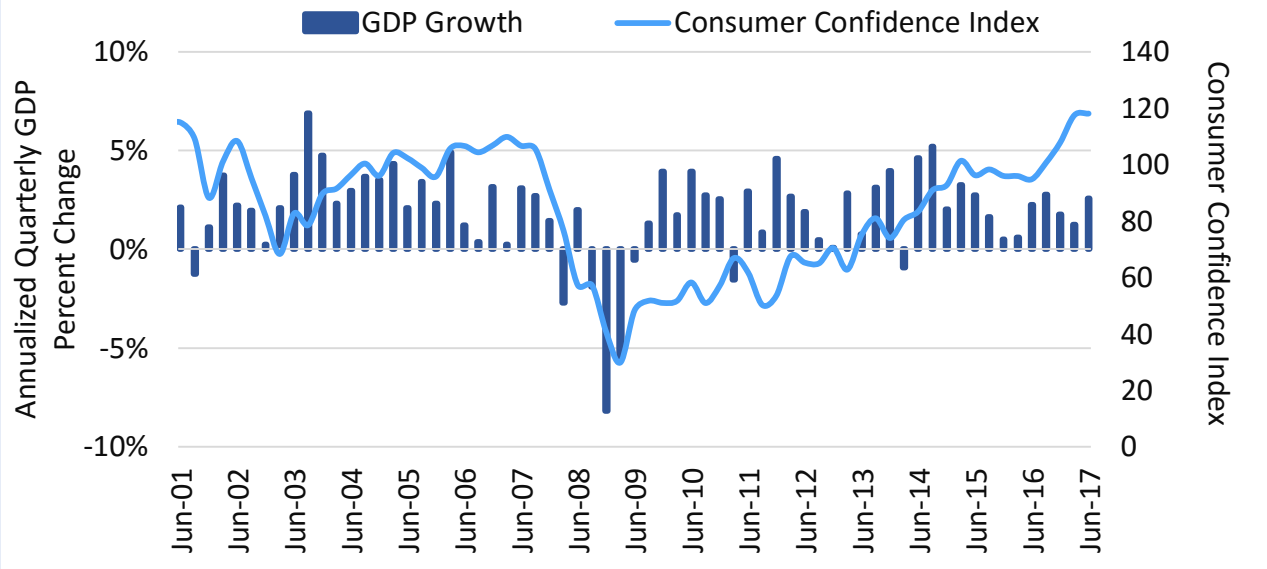
- US Macro Conditions
 - USA today mirrors tensions in 1930's- slow growth , deep divisions- regionally, socially, economically, politically
 - Recent Eurozone economic growth is encouraging; increased geopolitical risk of a miscalculation by rogue/non-state players
 - Getting US GDP growth from 2% up to 3% is the heavy lift
 - Potential for Pro-Growth policies come in two forms:
 - Executive: loosening of regulations- which is coming as departments are being staffed
 - Legislative: (tax reform, education reform, health care re-reform, infrastructure spending) may take some time to play out
- Immigration and trade restriction policies impact is currently at the “margins” – but evident
 - The 6 Int’ l Gateway Cities are exposed the most; Other major cities benefit from domestic migration
 - Extractive (mining) and transformative (manufacturing) regions may benefit slightly vs. tech—but long term wealth creation is still intellectually based– in all its forms
 - There are ripple effects in the construction trades, raising costs/delaying completions—now in evidence
- Yet, in a still low yield Environment Where Can An Investor Find Yield?
- Monetary Policy, and the Debt Surge it has engendered in the Gov’t & Publicly Traded corporate sector, has reached its limits (or very near its limits)— Pro-growth Fiscal policy *is* the way forward
- US Multifamily, and US Commercial Real Estate, is still the place to be, but the ride is going to be bumpy

How Do Things Look Now?

The Outlook remains positive; the extent of which is based upon the balance of pro-growth vs. immigration/trade policy emphasis

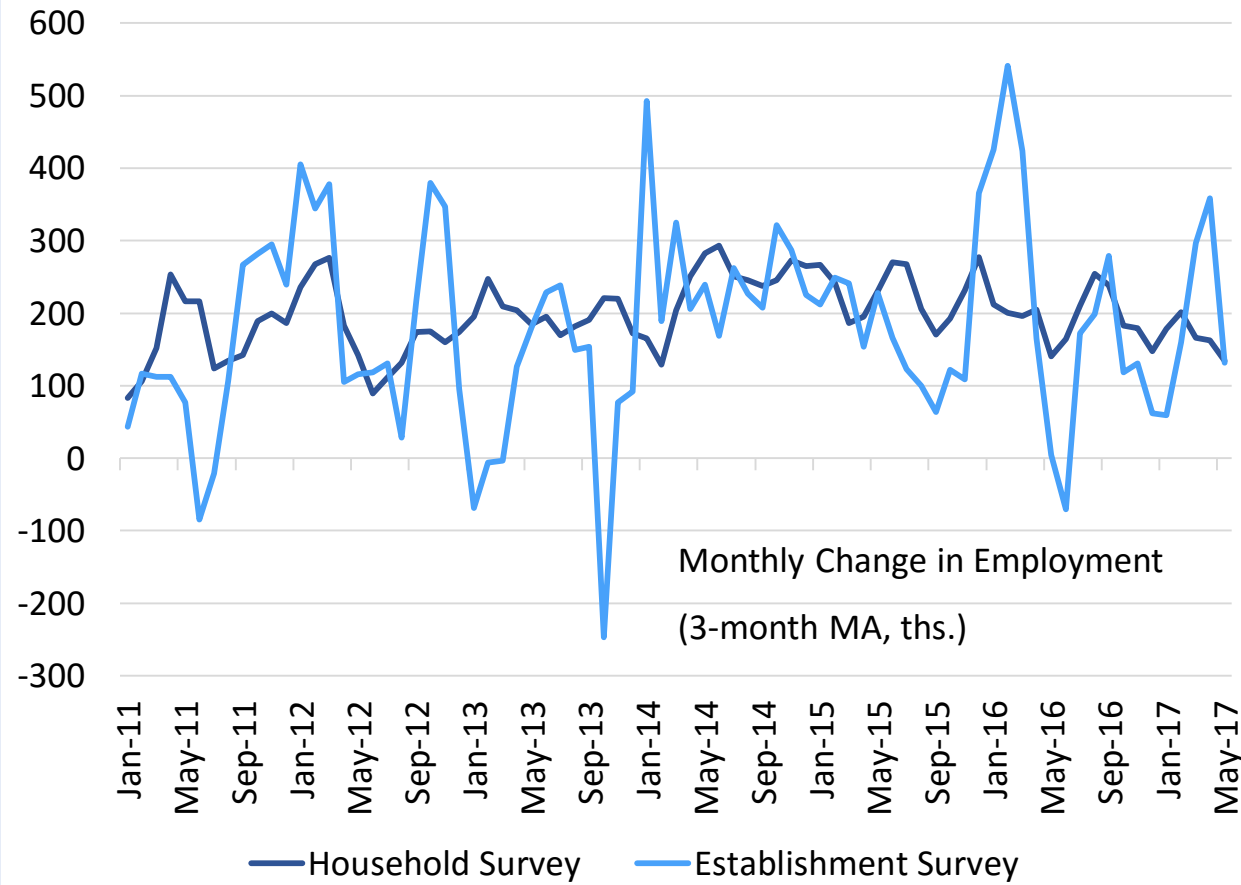
- Apartment market conditions
 - High occupancy on stabilized properties, but sliding; Mkts/Sub-mkts with new supply impacted the most
 - Decelerating rent growth- ~2-3% ; muted new supply impact has provided a pleasant summer surprise in rent growth
 - Structural components of demand are still big tailwinds as before
 - Wage pressures in the US are growing, finally catching up to rent increases in some US Markets
 - Supply is peaking now in '18- 2017; 300K, 2018: 360K, 2019; 300K
- Dislocation in Comm'l Real Estate Debt Markets, driven by regulatory influences, is restraining growth in new construction financing
 - Dislocations in Bank and CMBS debt markets will extend the apartment rental growth up-cycle
 - Debt availability and cost is more tied than ever to global financial markets, despite the steadying influence of the GSEs (50% debt market share, and able to do more with Green/Affordable/Small Balance/ Variable Rate Programs).
 - Long-term rates are not moving at the same pace that is expected in short-term rates
 - Yield Curve shape bears close watching;
- Asset Value growth will be restrained, but not stopped, due to these cross-current
 - Depends on pace of income growth relative to upward interest rate movements
 - But watch out below if fiscal policy stalls, and job growth stalls with it in the next 24 months
- Long Term Technology Revolutions in Energy & Transportation are now within the 10 yr. investment horizon
 - Time to put it on your radar screen

U.S. Economic Growth is OK

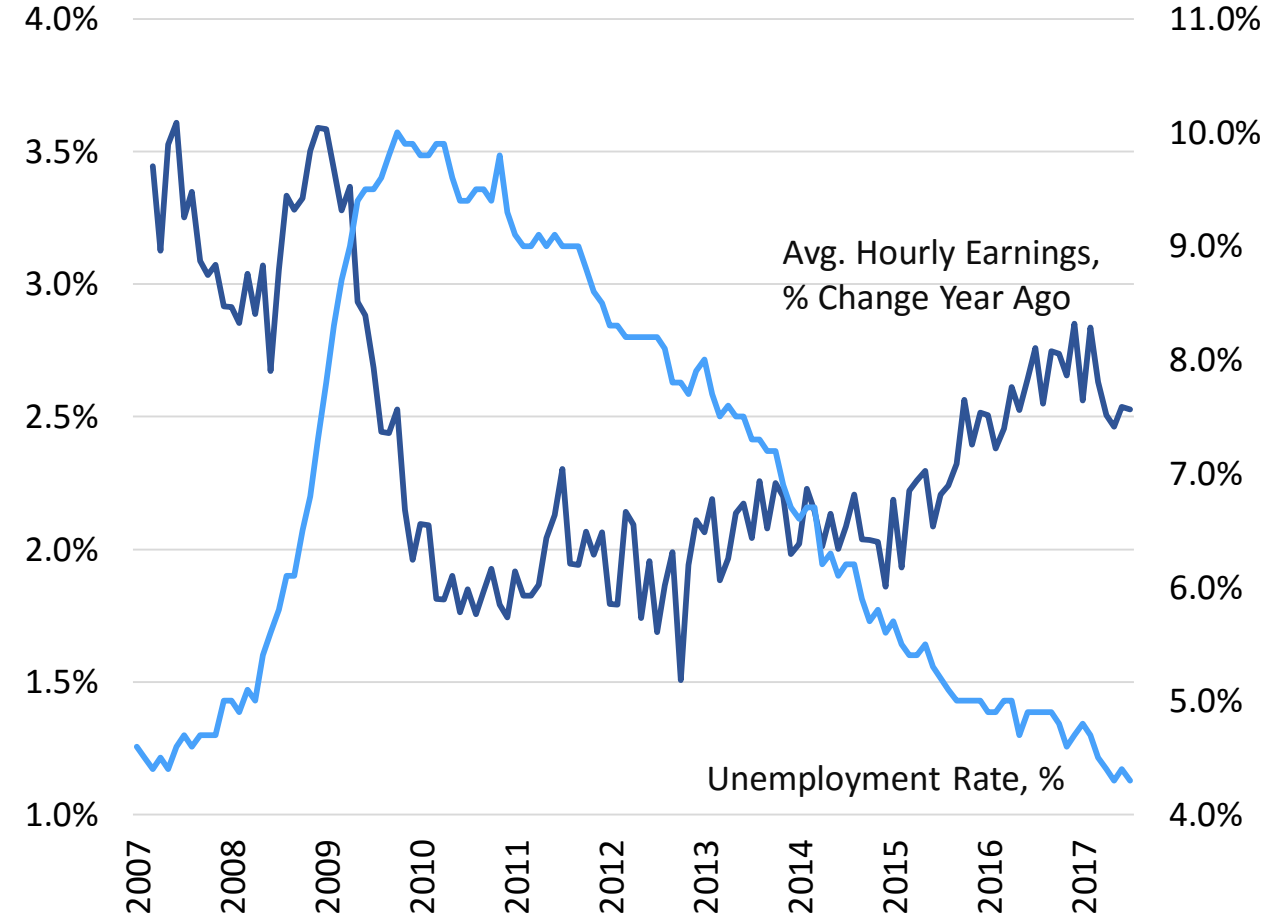


Job Growth and Wage Growth

Job formation good, but a tad more volatile



U.S. Wage Pressure Increasing



Earnings Are Being Artificially Held Down

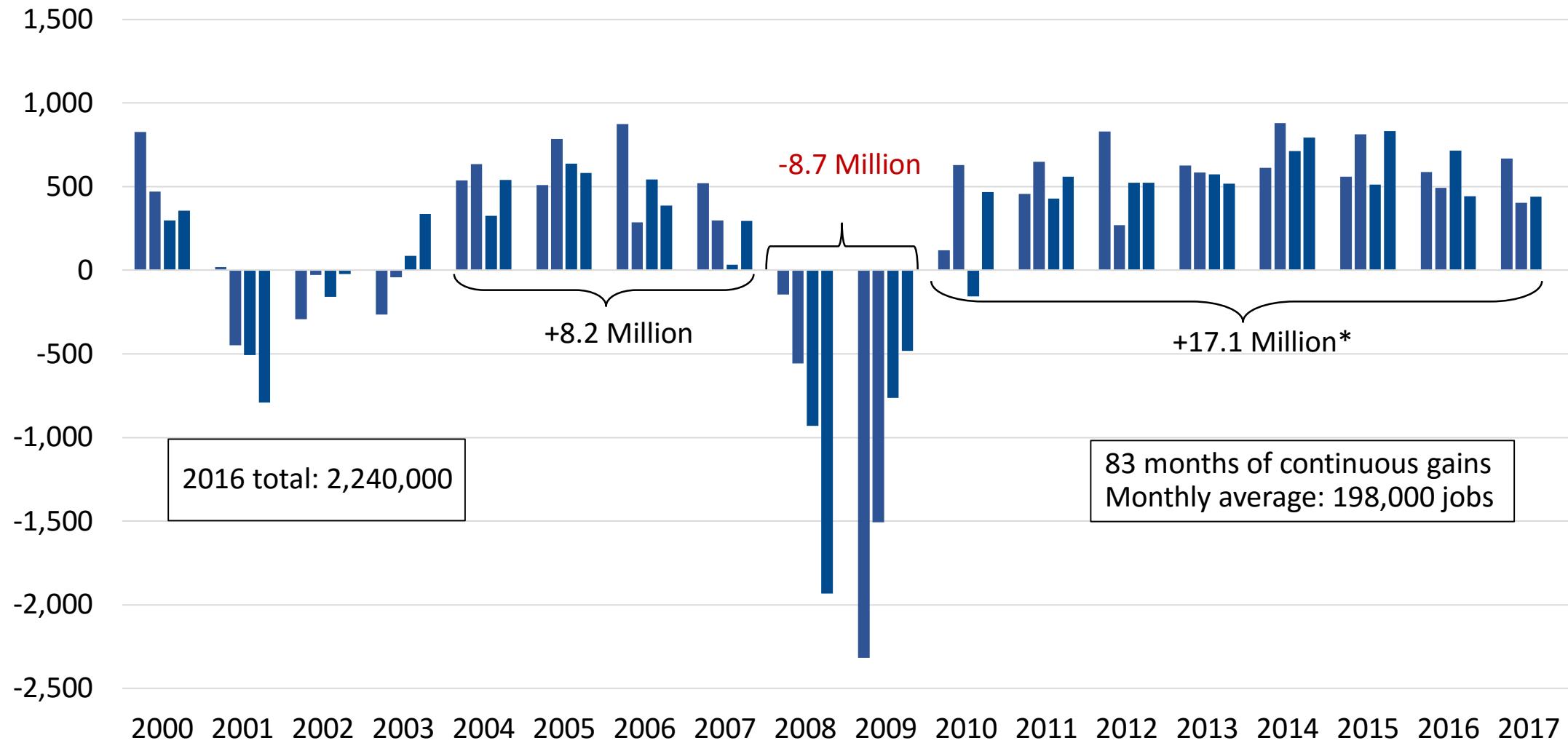
The Good News on Wage Growth

The San Francisco Fed Aug 14, 2017

- ✓ *The overall exchange of new workers for new retirees is holding earnings down by a little under 2 percentage points. Median weekly earnings actually rose in 2Q to +4.2% y/y, according to the U.S. Department of Labor. That's the fastest pace since 2007. Adjust for baby boomers and that would rise to +5.2%.*



Quarterly Job Growth

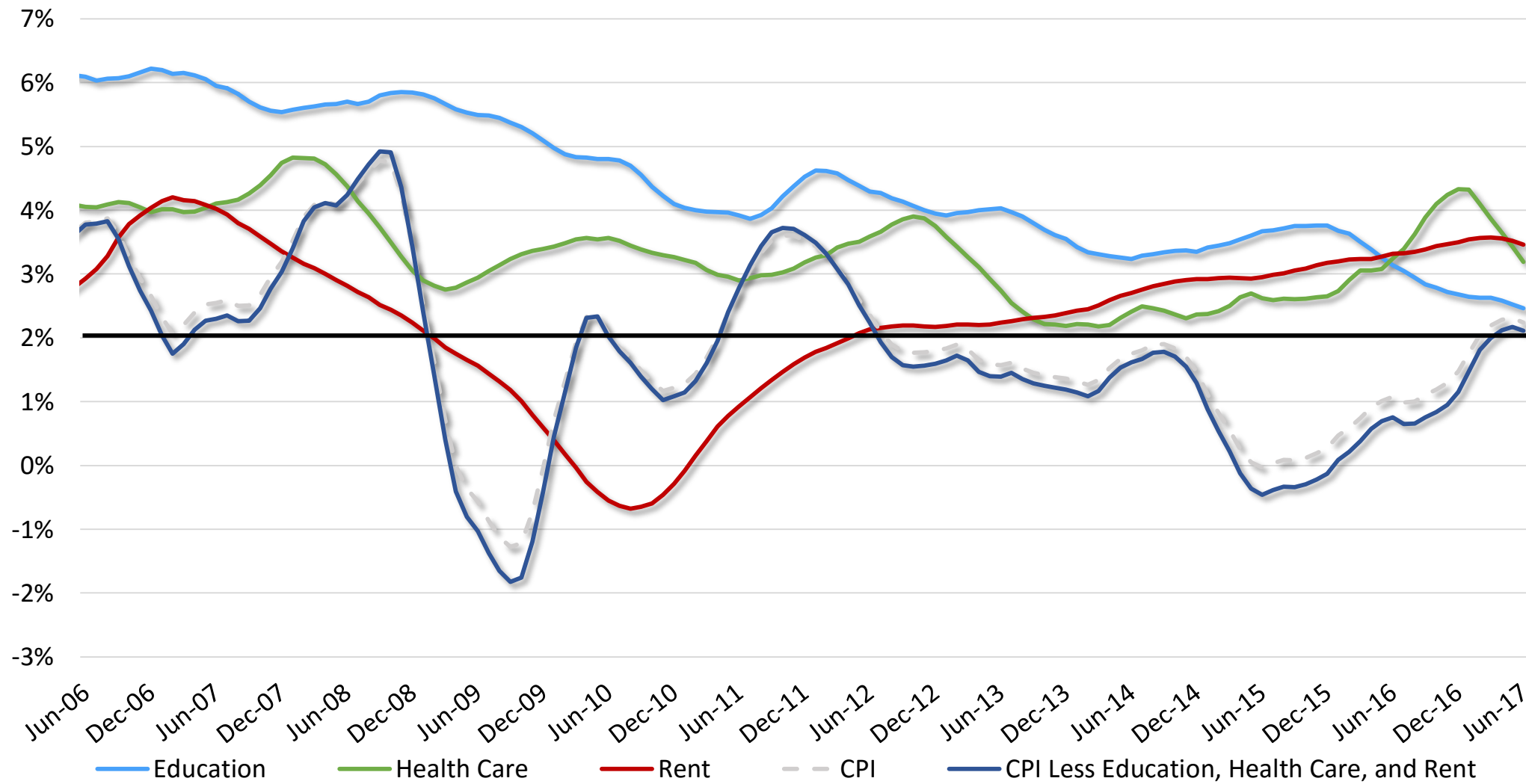


2016 total: 2,240,000

83 months of continuous gains
Monthly average: 198,000 jobs

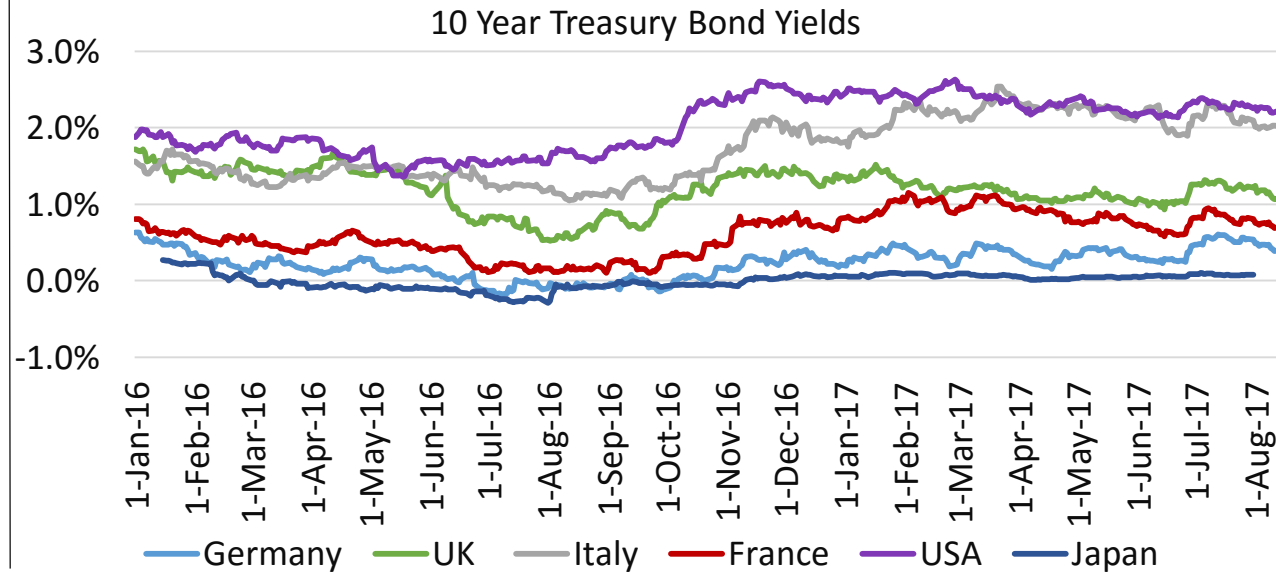
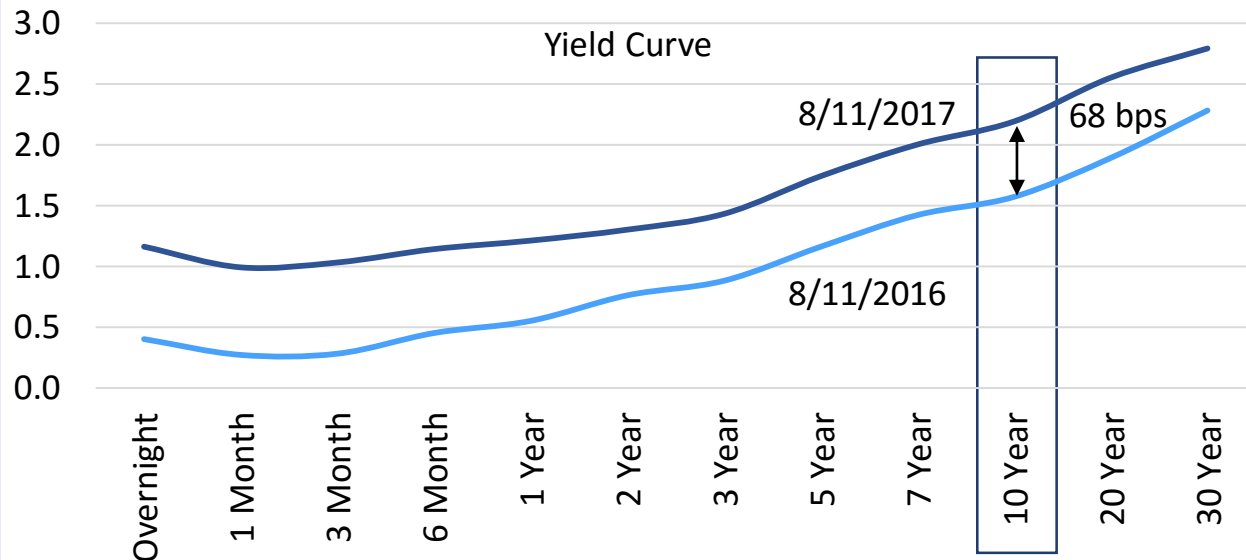
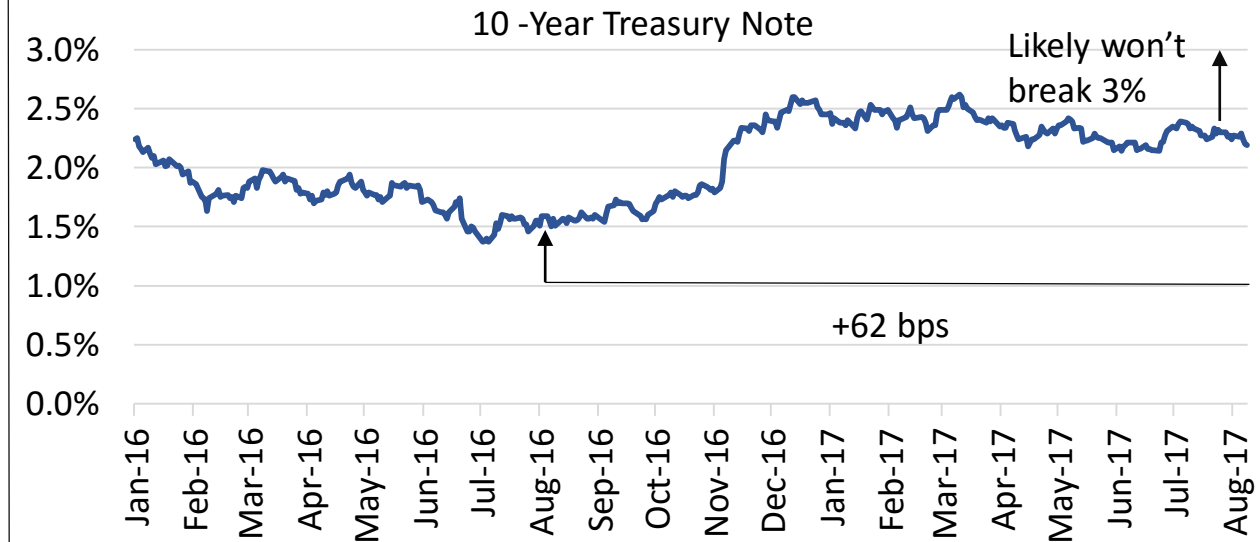
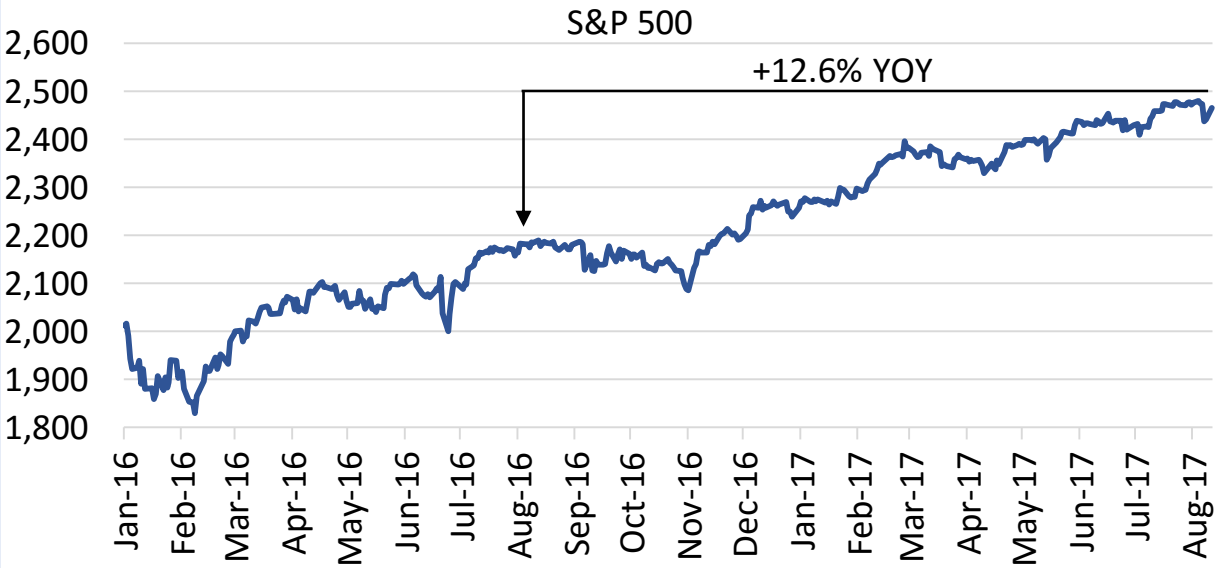
*Through August 2017
Source: Bureau of Labor Statistics (BLS)

Inflation Rising, But Unlikely to Break Out >2.5%



*Growth numbers are YOY 6 month moving averages. CPI Less Health Care, Education and Rent is an estimate using the BLS document "Math calculations to better utilize CPI data"

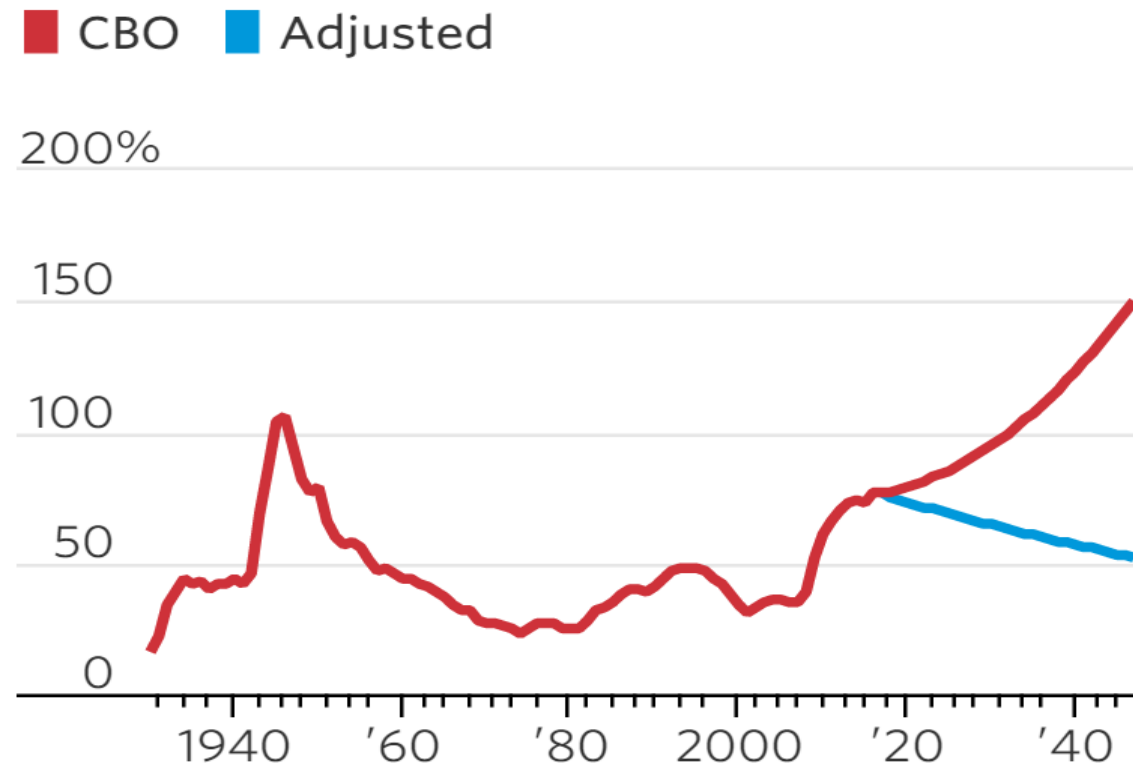
U.S. and International Financial Market



Source: Moody's Analytics; Investing.com

It's Not All Sunshine and Roses...

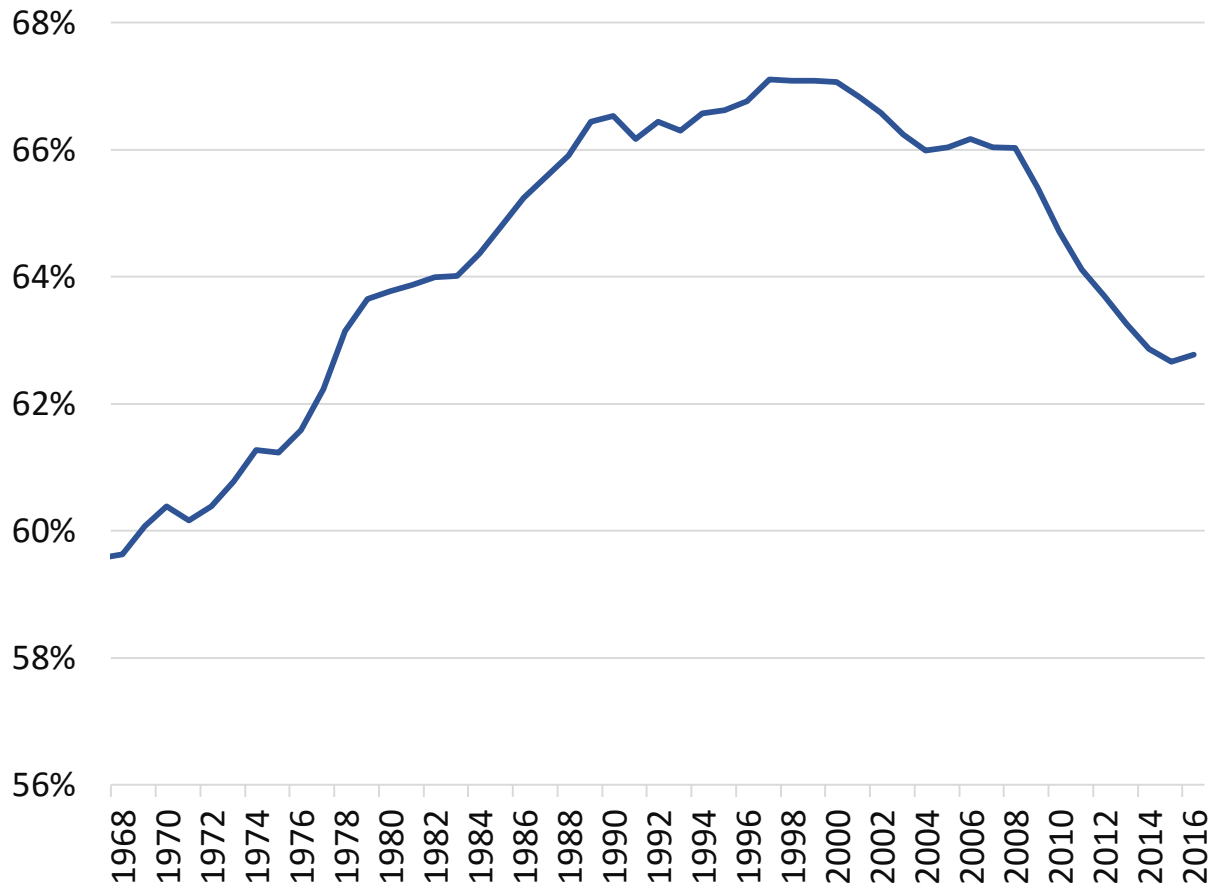
- Raising long-term GDP growth from 2% to 3% drives just about everything
 - US government debt, equity markets, corporate debt, etc.
 - That's what matters



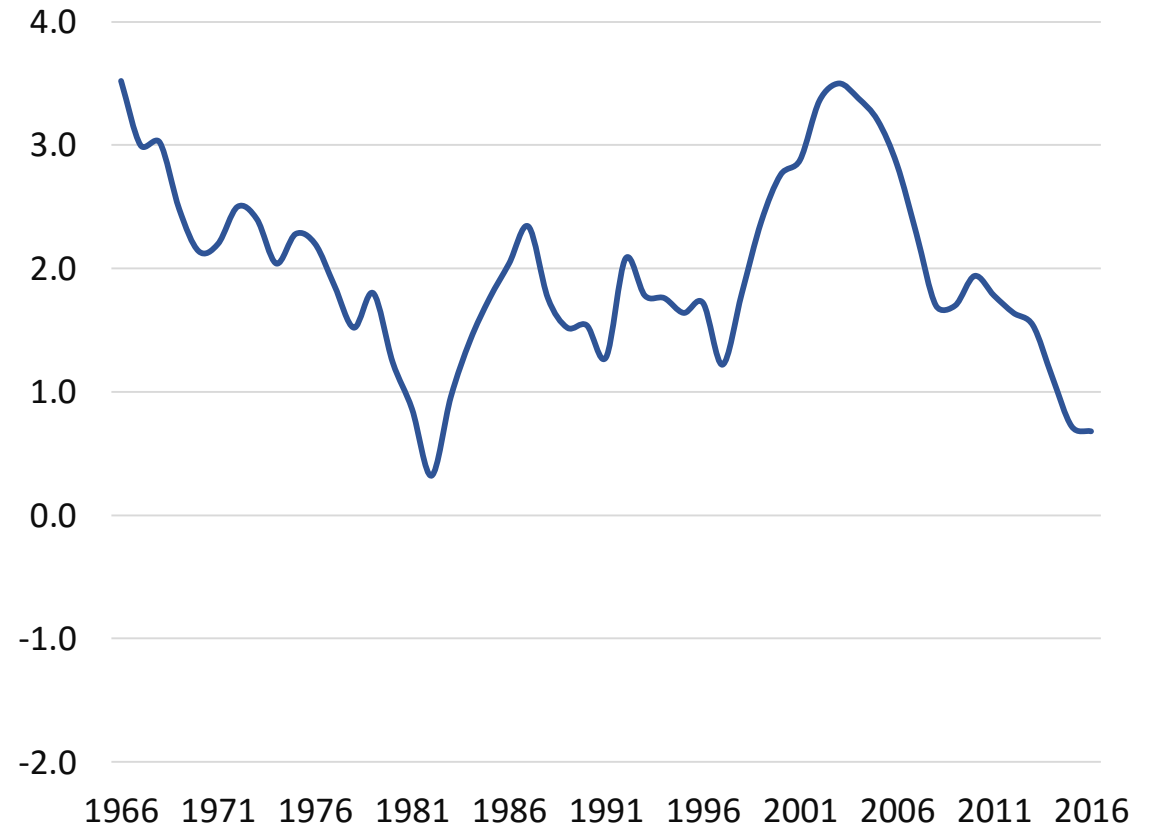
Getting U.S. GDP to Grow Means Swimming Upstream

Where will U.S. GDP growth come from?

Labor Force Participation Rate



Labor Productivity Annual Change Nonfarm Business Sector

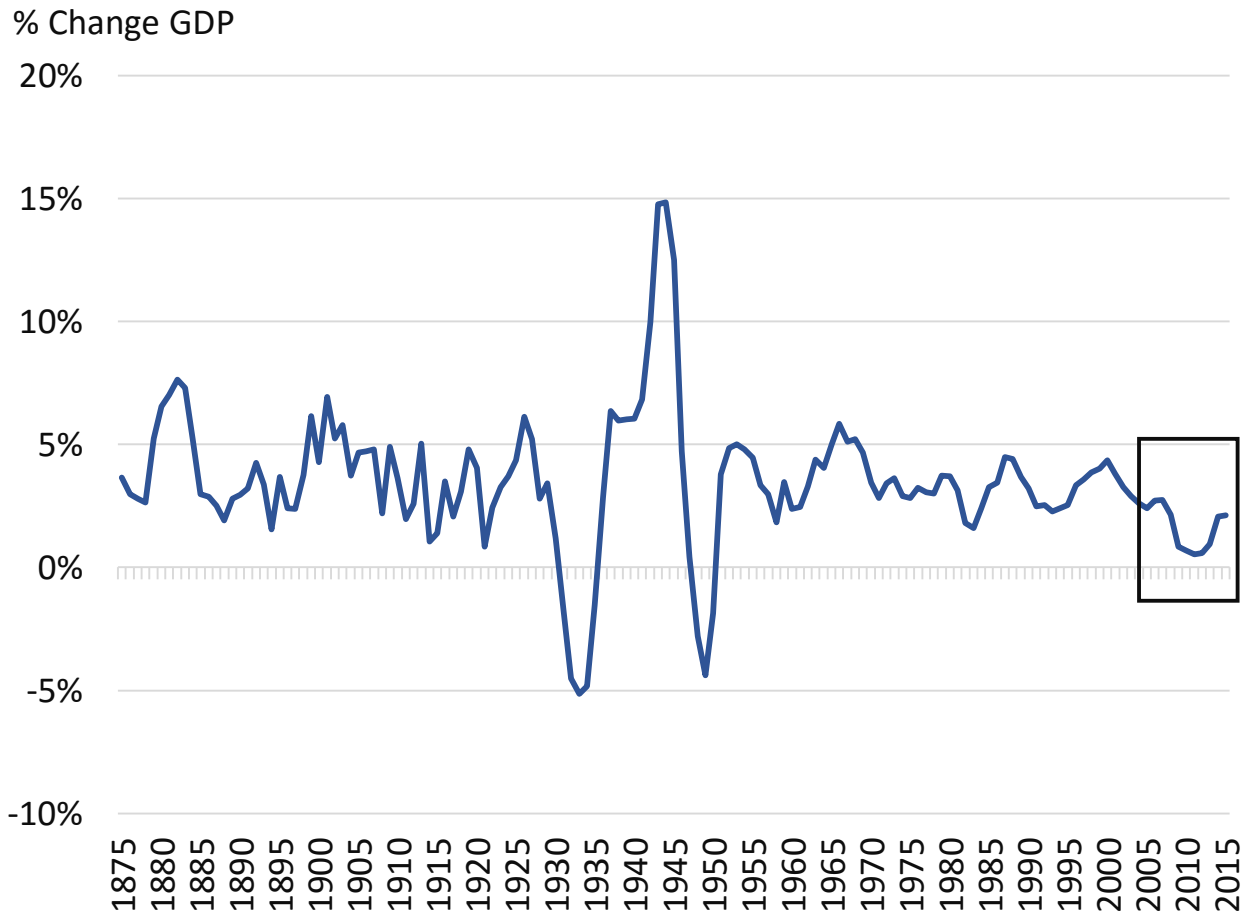


*Through December 2016

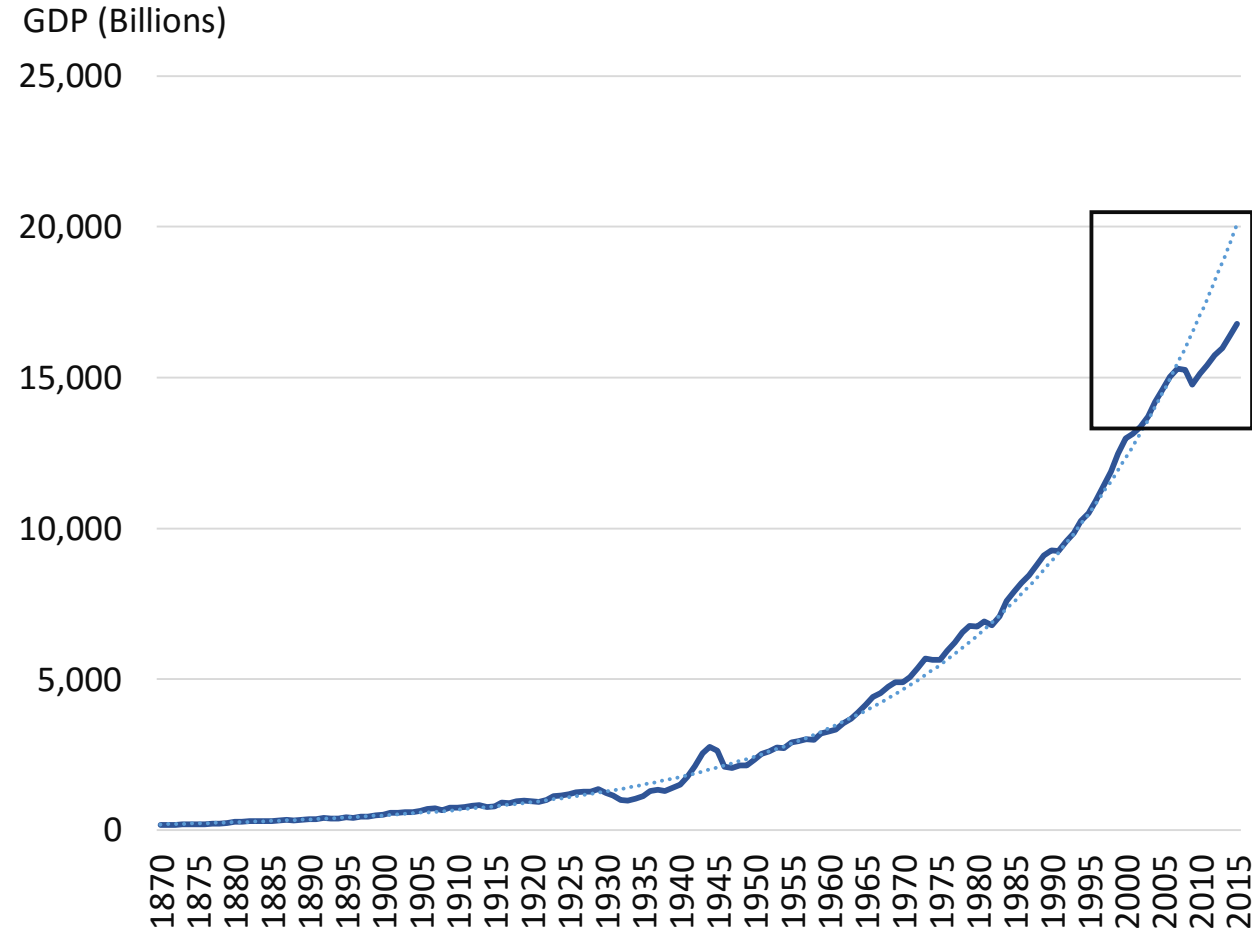
Source: Moody's Analytics; Bureau of Labor Statistics (BLS)

GDP Has Been Slow to Recover, Feels Like the 1930's

Currently in a Slow-Recovery Period



GDP Falls Short of Trend line



*Percent change GDP figures are YOY 5-year moving averages

Economic Structure Transition Problems

Composition of recent job gains enabled by duration of expansion

GOOD:

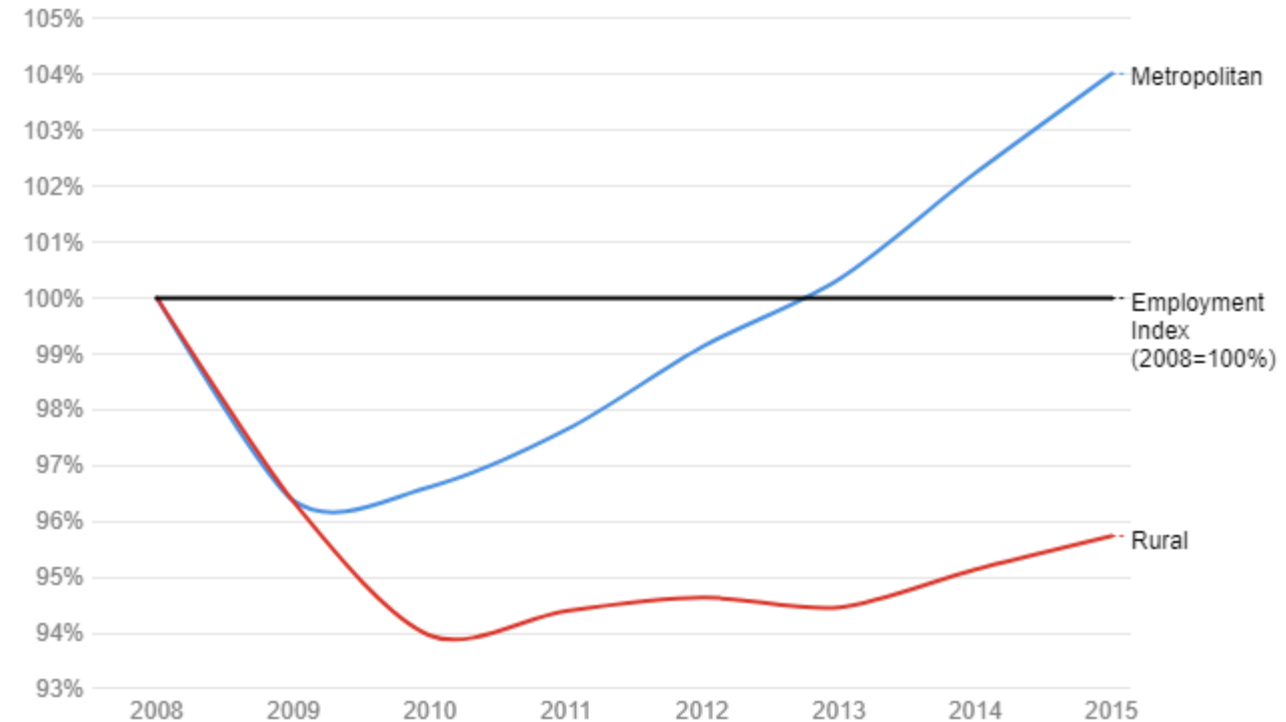
- Coming from the lower-end
- Pulling people off the sidelines

BAD:

- Heavily concentrated around large metros with intellectual capital nodes
- Isolating rural Americans, leading to rural poverty

Job growth in America

Since 2008, job growth in metropolitan areas has outpaced that in rural areas.

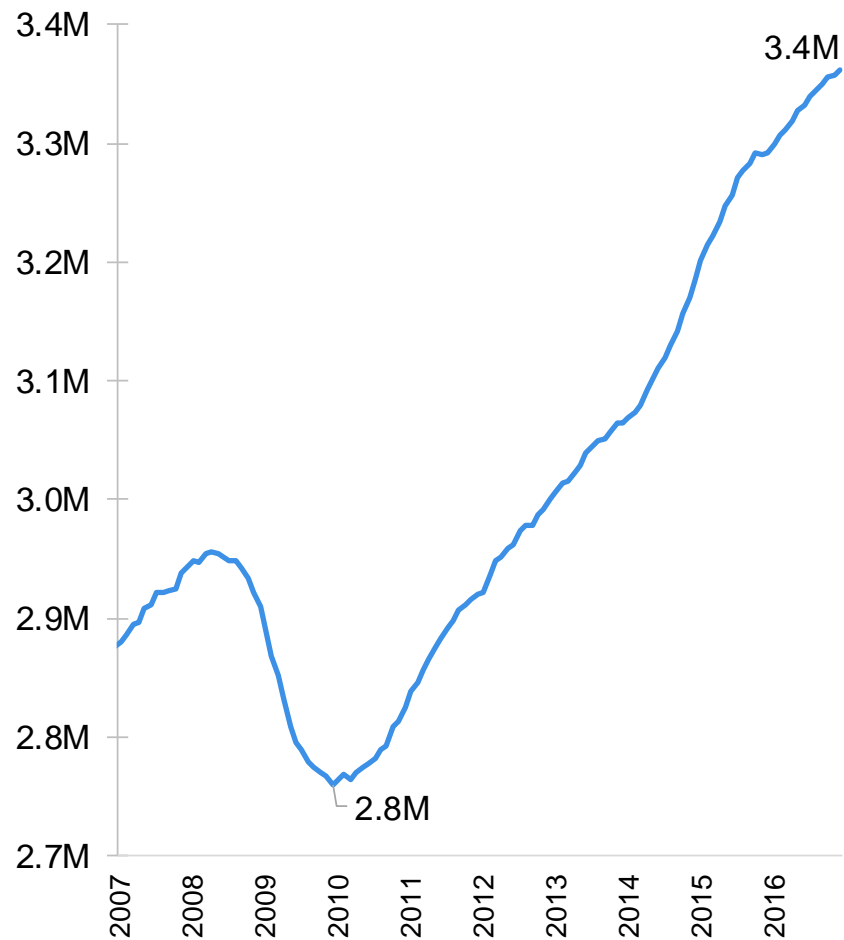


The Conversation, CC-BY-ND

Tech Employment Up, But Job Growth is Slowing

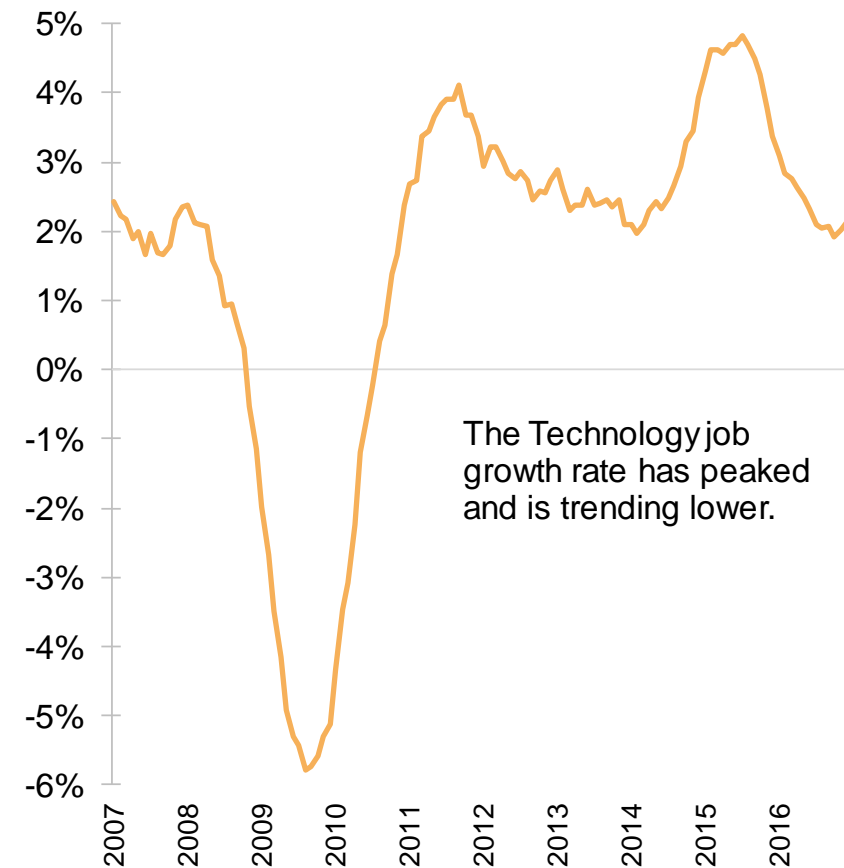
Employment up since bottoming in late 2009, but job growth is slowing

Technology Sector Employment



Technology Sector Employment

YOY growth



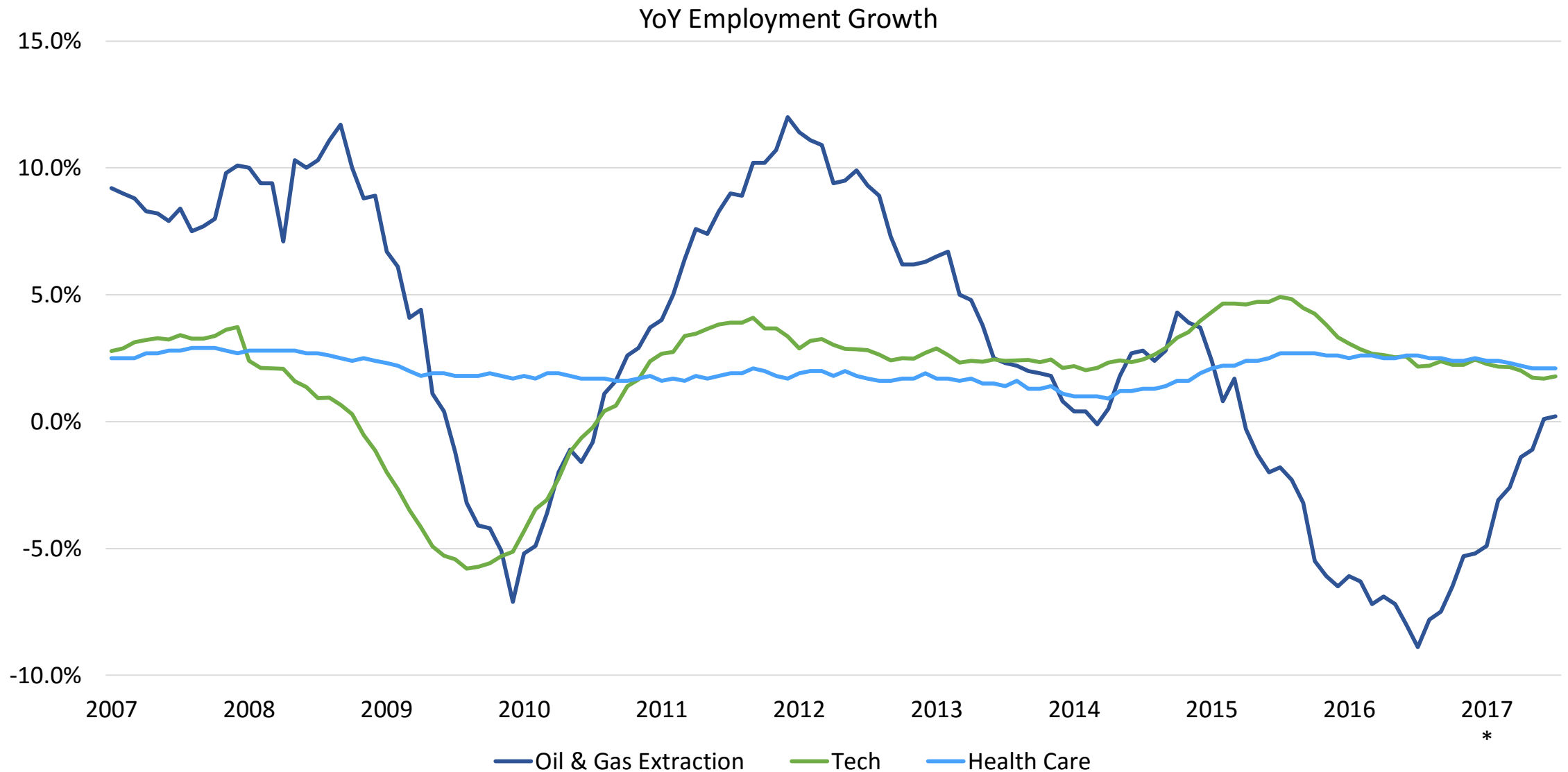
The Technology job growth rate has peaked and is trending lower.

*Technology jobs are defined as Bureau of Labor Statistics (BLS) NAICS codes:

Computer and Electronic Products, Data Processing & Hosting, Computer Systems Design and Related Services

Source: John Burns Real Estate Consulting, LLC; Bureau of Labor Statistics (BLS) (Data: Dec-16, Pub: Feb-17)

Former Engines of Expansion Rebalancing but Sustaining



*Through July 2017

Source: Bureau of Labor Statistics (BLS)

U.S. Federal Policy Mix is Mildly Pro-Growth

Pro-Growth

- Regulatory Relief
- Executive Orders
 - Energy
 - Finance
 - Labor Costs



Generally Positive
Progress

Pro-Growth but Slow

- Tax Reform
- Healthcare Reform
- Infrastructure
- Education Reform
- German Model



Progress in Tone,
but Not Yet
Substantive

Anti-Growth

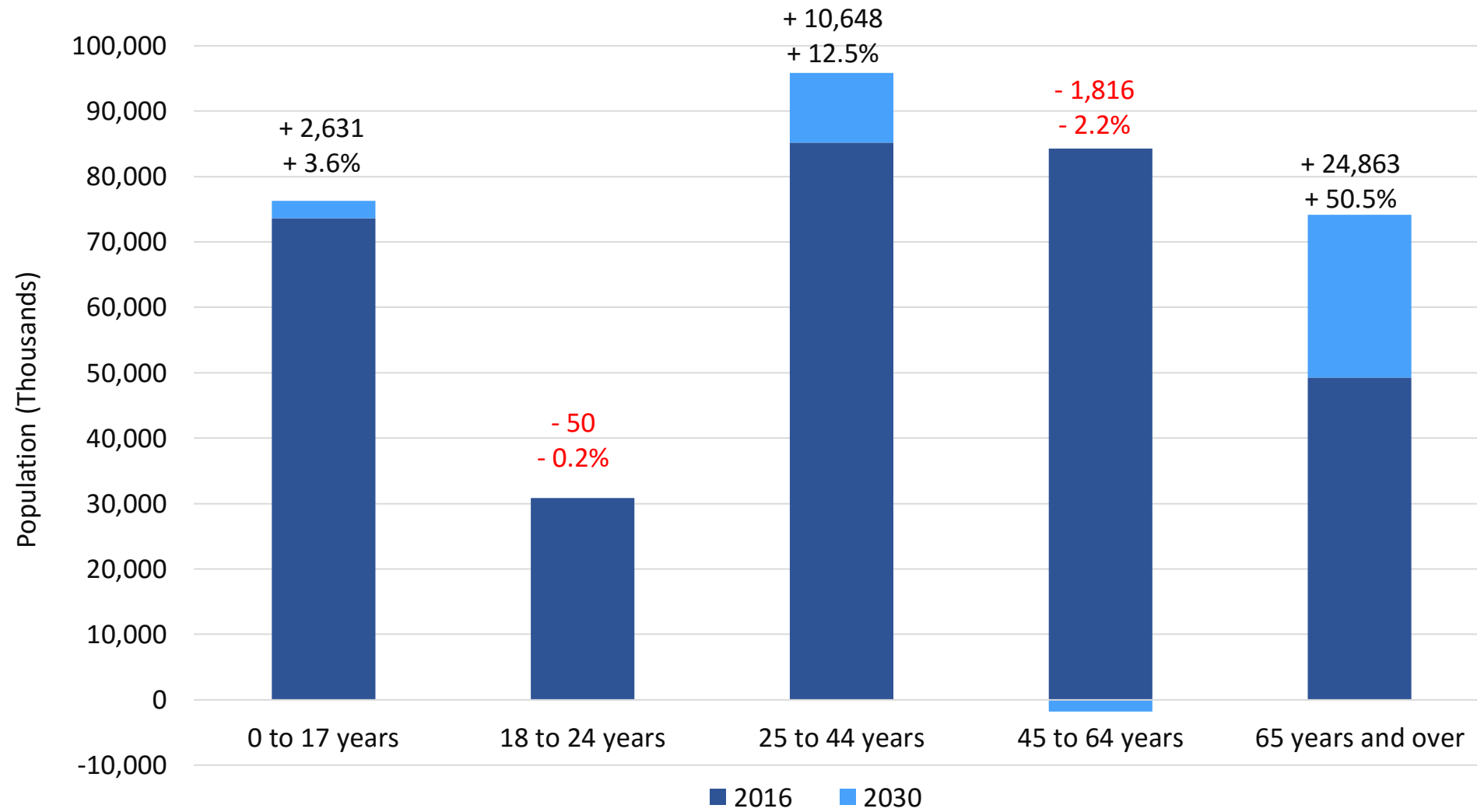
- Immigration Control
- Trade Renegotiation



Noise but Some
Derivative Impacts

Demand Trends

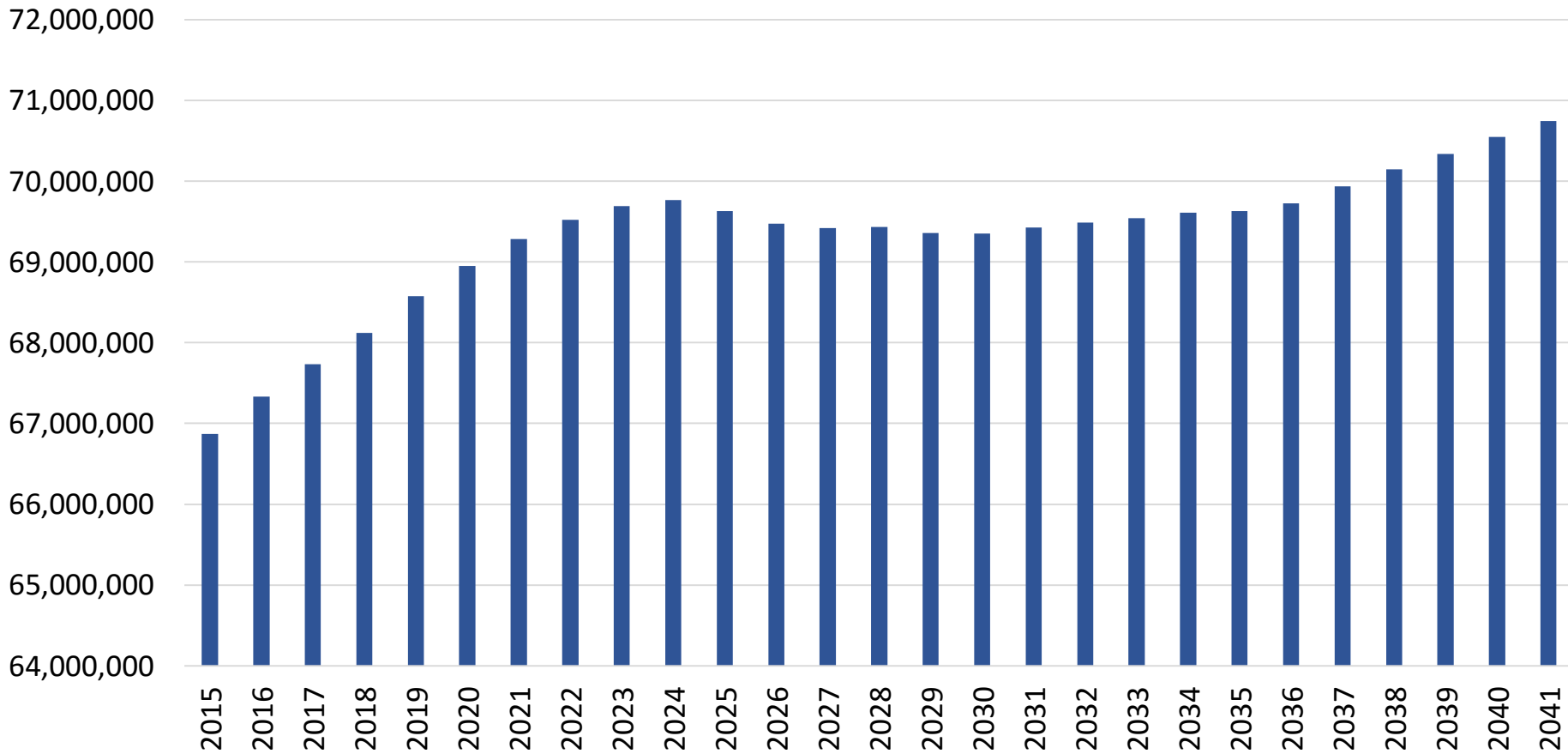
Age Cohorts Today vs 2030



Renter Population is Expected to Grow

Demographics are in multifamily's favor over the long-term, especially in the younger aged cohort...

U.S. Renter Population: Age 20-34 Cohort

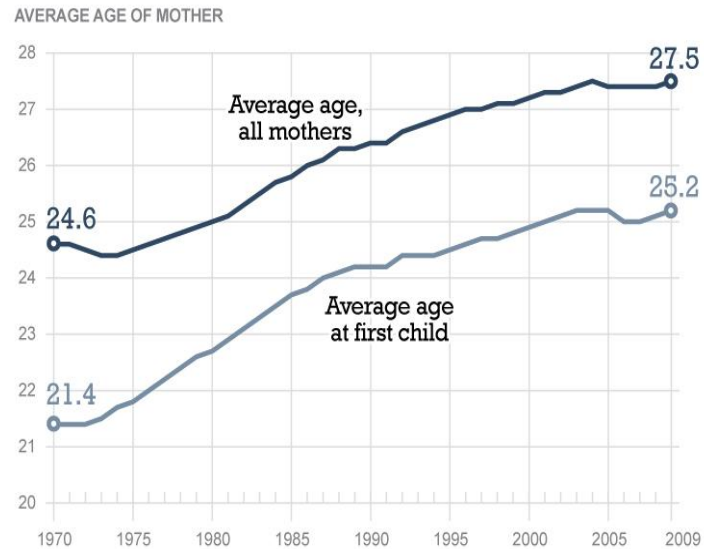


Millennial Tailwinds

FACT:

The average age of first-time mothers has steadily increased

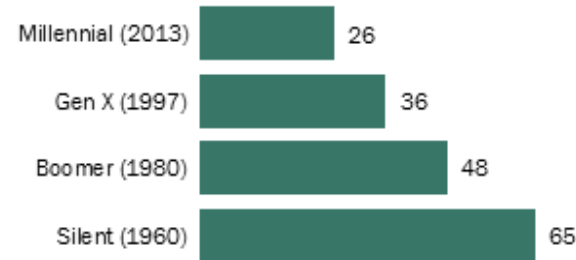
Since 1970, the average age of mothers giving birth to their first child has increased from 21 to 25. For all births, the average age of the mother has increased by about three years over this same period.



Source: National Center for Health Statistics, National Vital Statistics Reports, 2011.

The Decline in Marriage Among the Young

% married at age 18 to 32, by generation

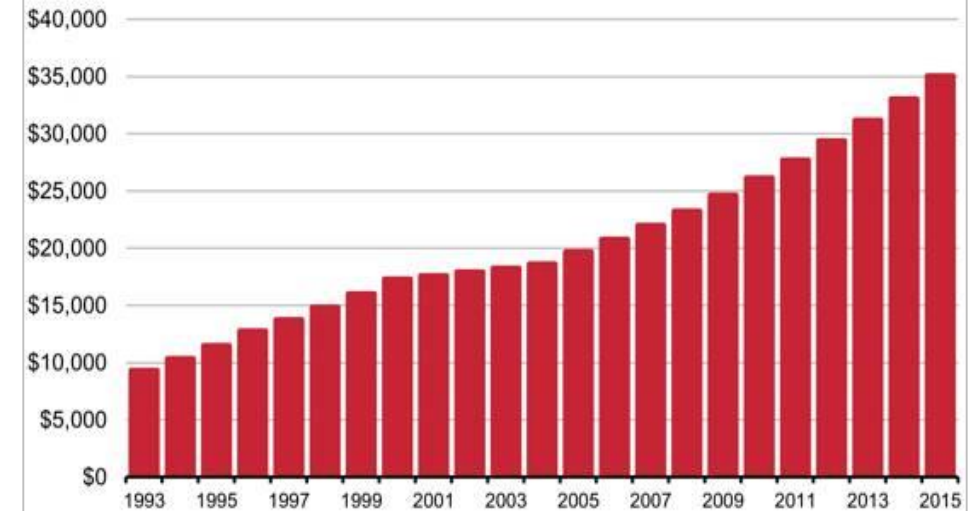


Source: Data from 1980, 1997 and 2013 are from the March Current Population Survey, 1960 data are from the 1960 Census

PEW RESEARCH CENTER

Head of the Class

Average debt per borrower in each year's graduating class



Source: Mark Kantrowitz | WSJ.com

CAGR Comparison

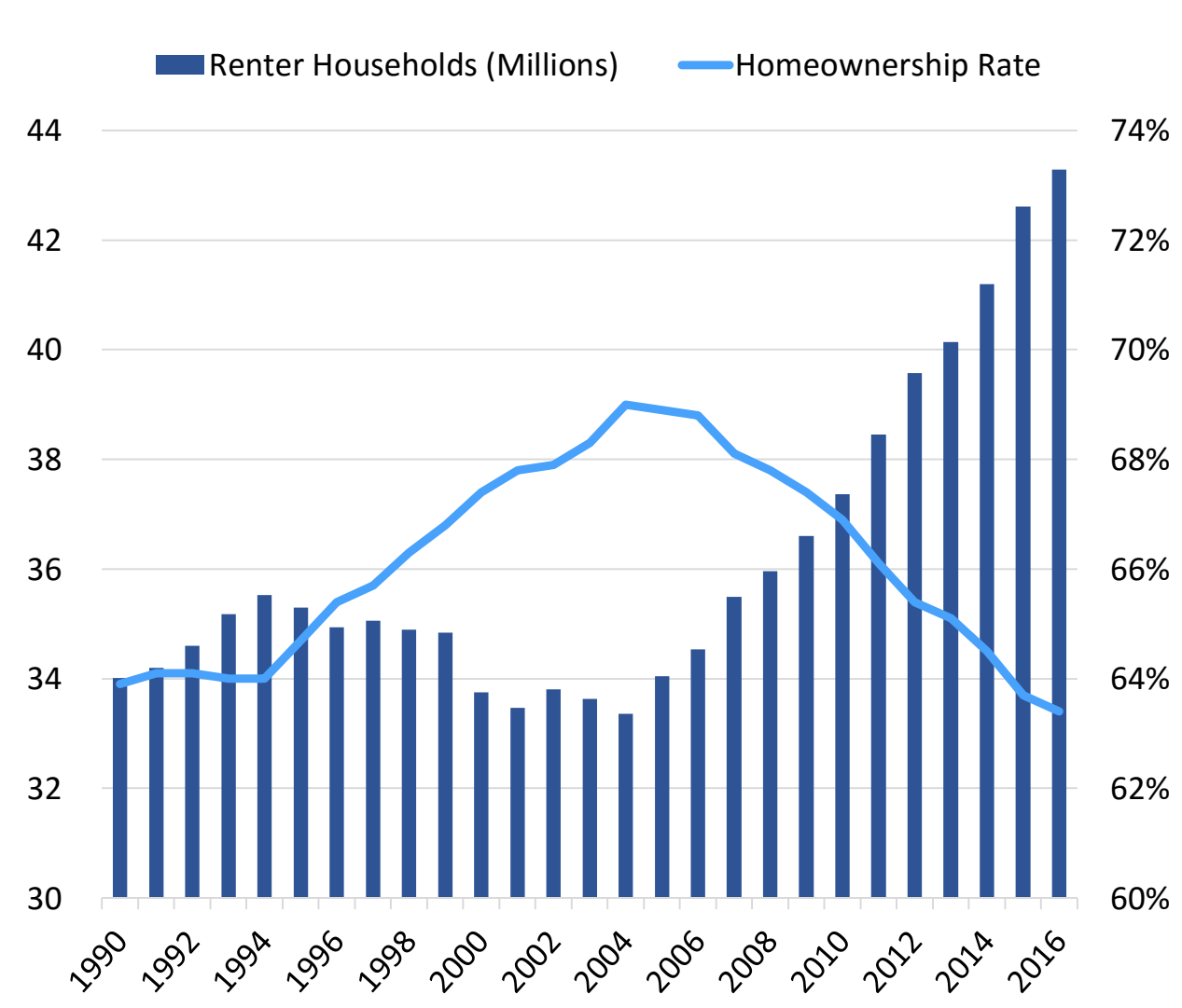
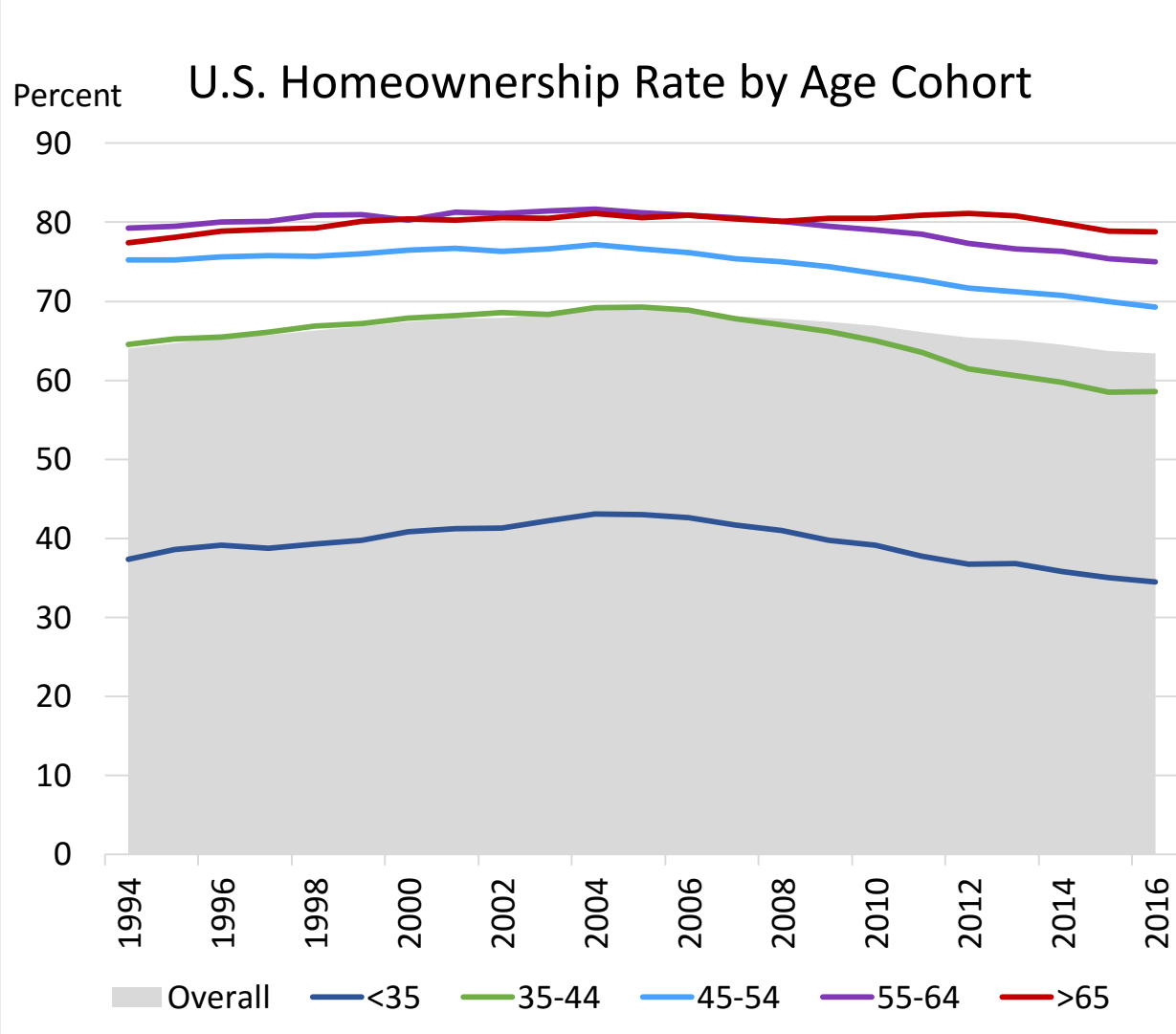
Student Debt Med HH Income*

5.8%

0.1%

*College Educated

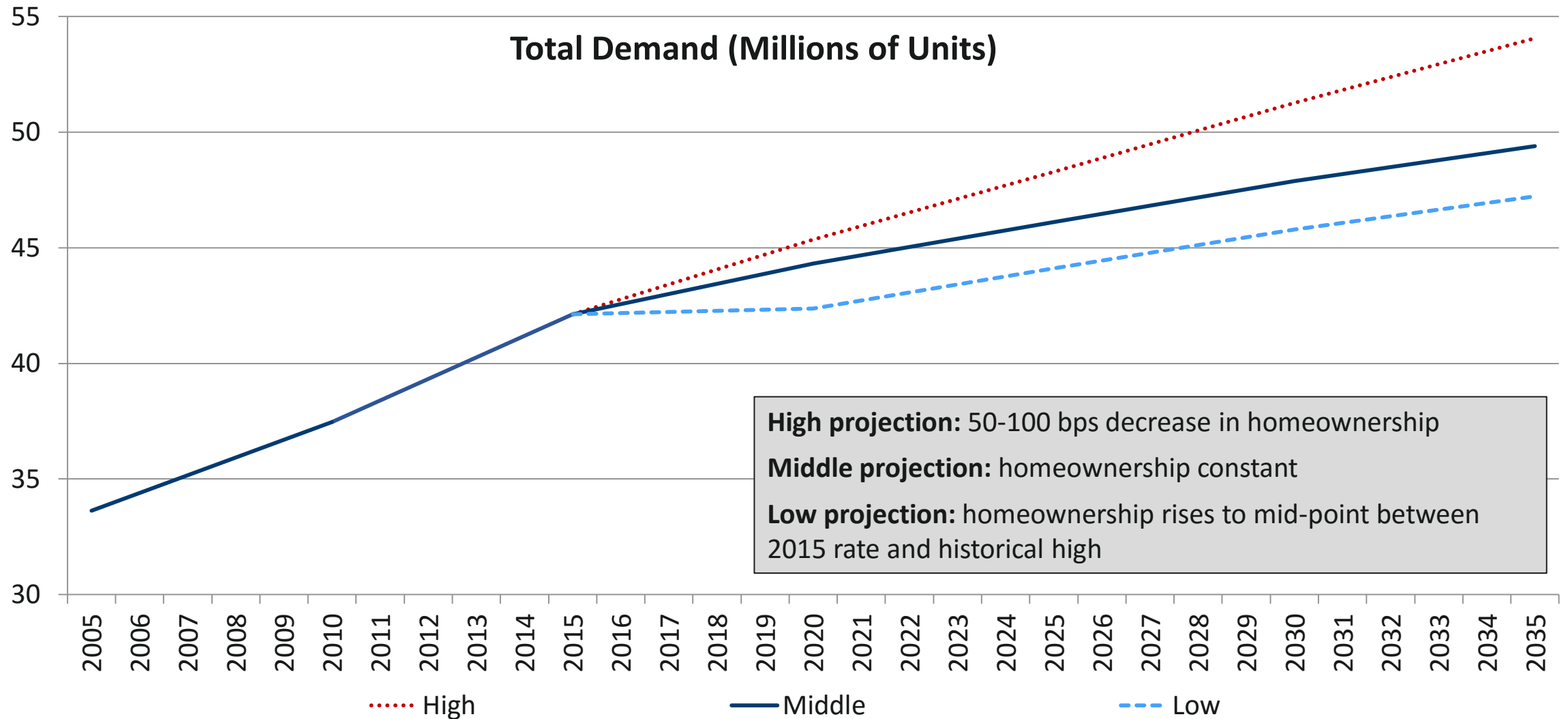
Homeownership Rates Leveling Off



*Beginning in 2000, renter household data are the revised, consistent-vintage counts. 2000-09 counts are 2010 vintage, 2010-15 are 2014 vintage



Future Rental Demand Looks Strong

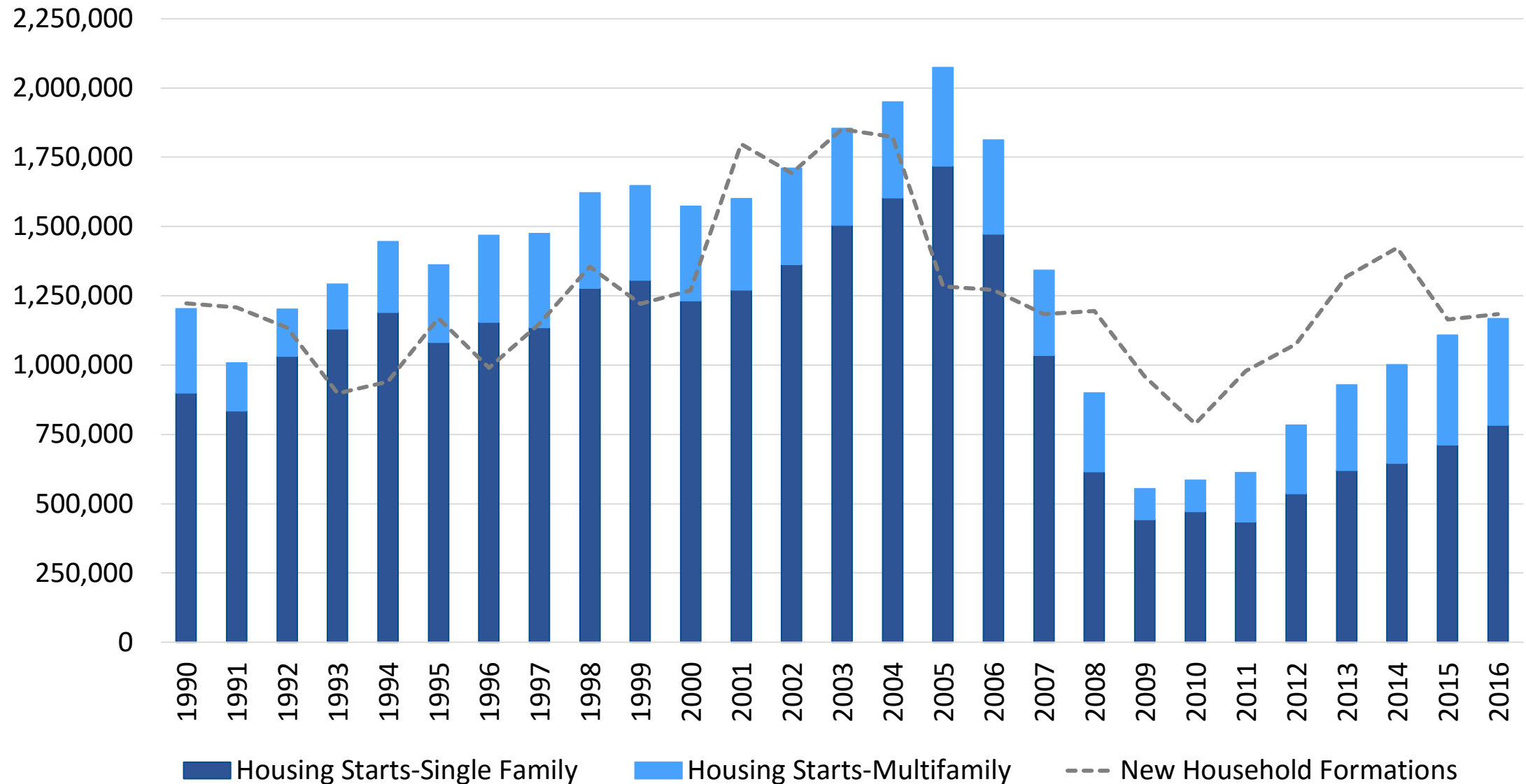


So What? Economy & Federal Policy

- Job growth overall looks good and reasonably steady – demand shock unlikely
- Inflation is range bound and unlikely to break out – either up or down
- Near term (12-24 months) pressures are building in the sectors that led us out of the last recession:
 - Technology and Healthcare – could be mitigated by pro-growth fiscal policy
- Coincides with current multifamily supply increase in some markets
- Long term demographics still look great
- Positive public policies can extend the expansion

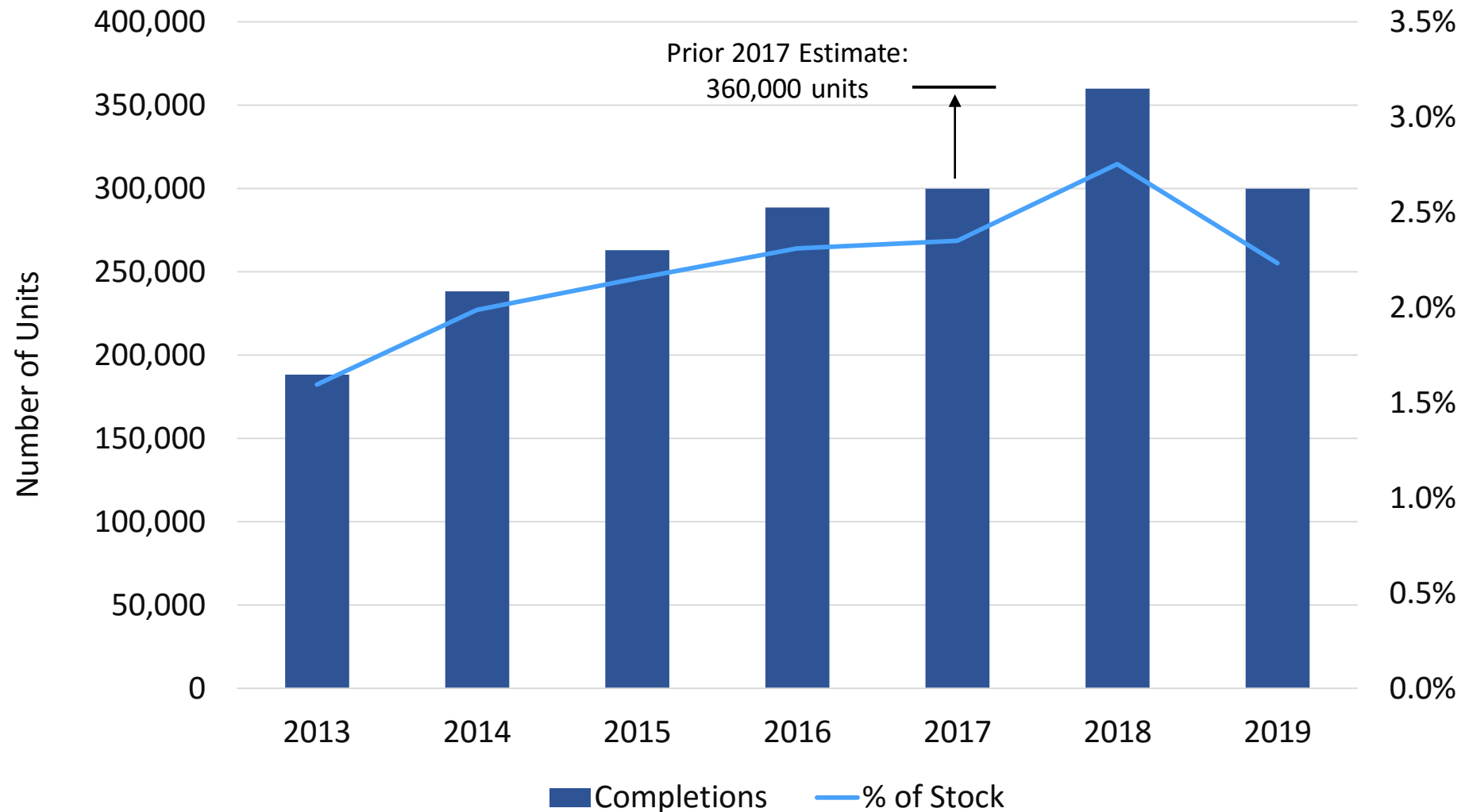
Commercial Real Estate Fundamentals

Total Housing Supply Still Lags Demand Since Recession

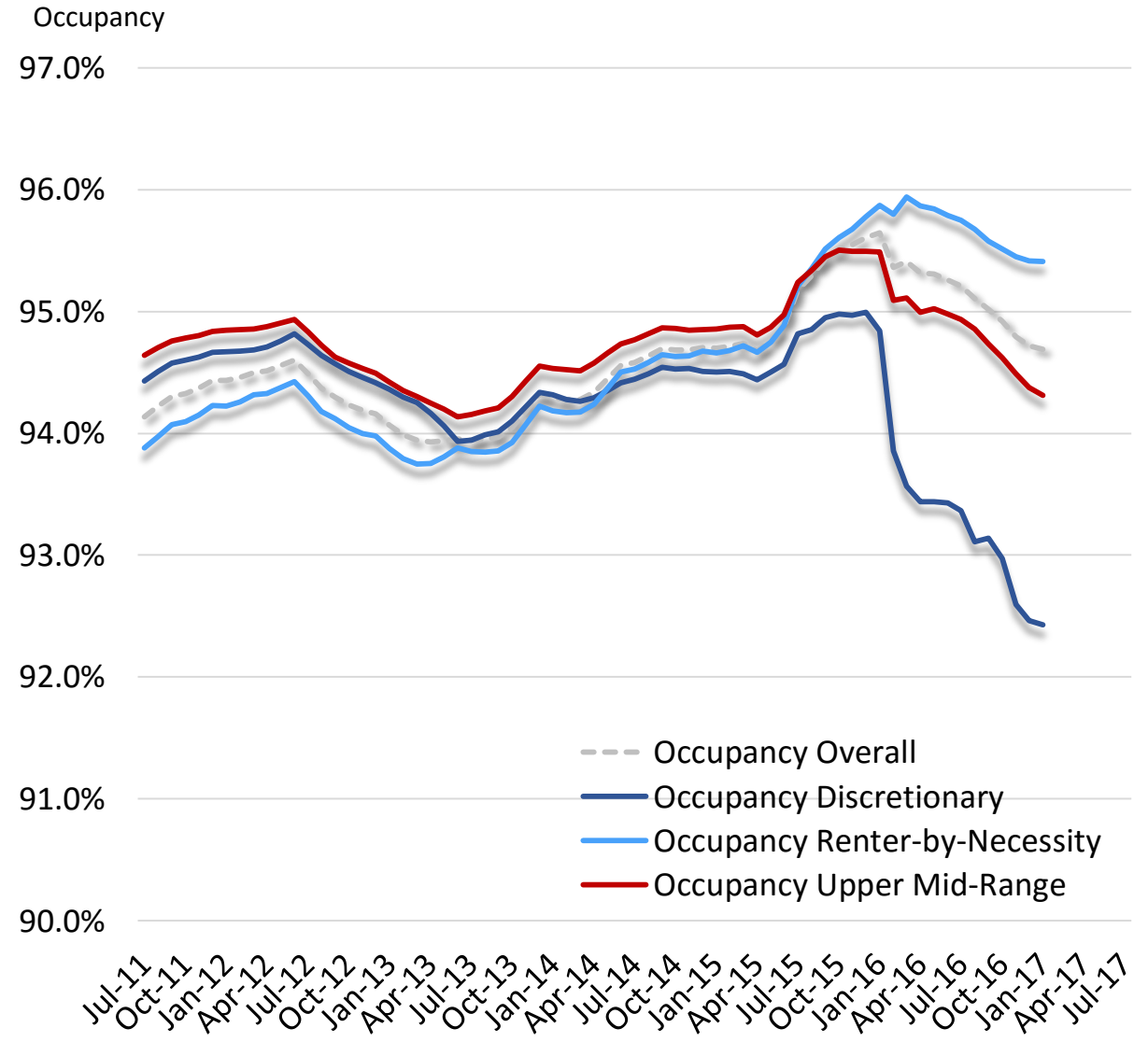
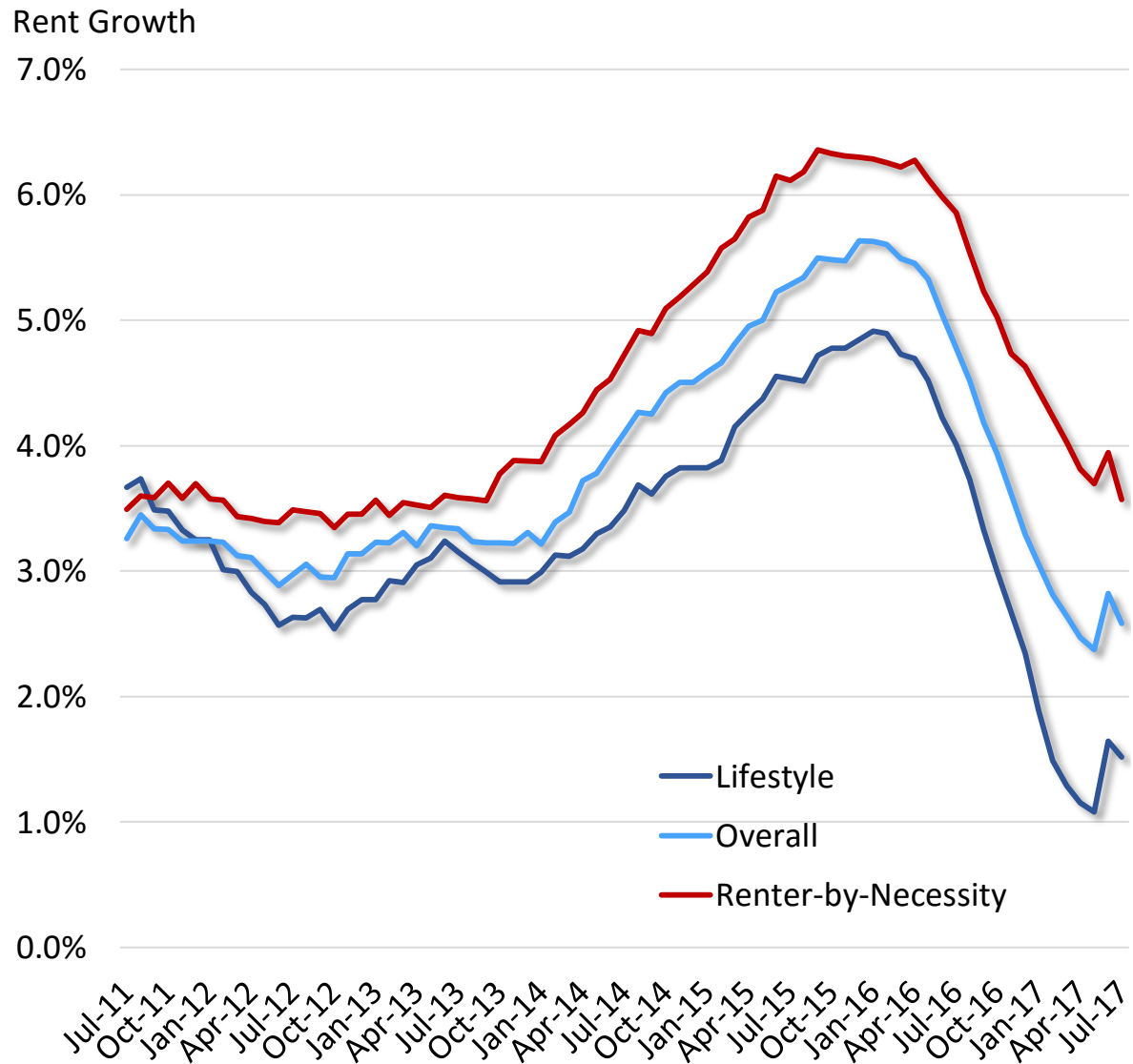


Source: Moody's Analytics; U.S. Census Bureau (BOC)

Supply Continues to Grow, but Has Leveled Due to Construction Delays

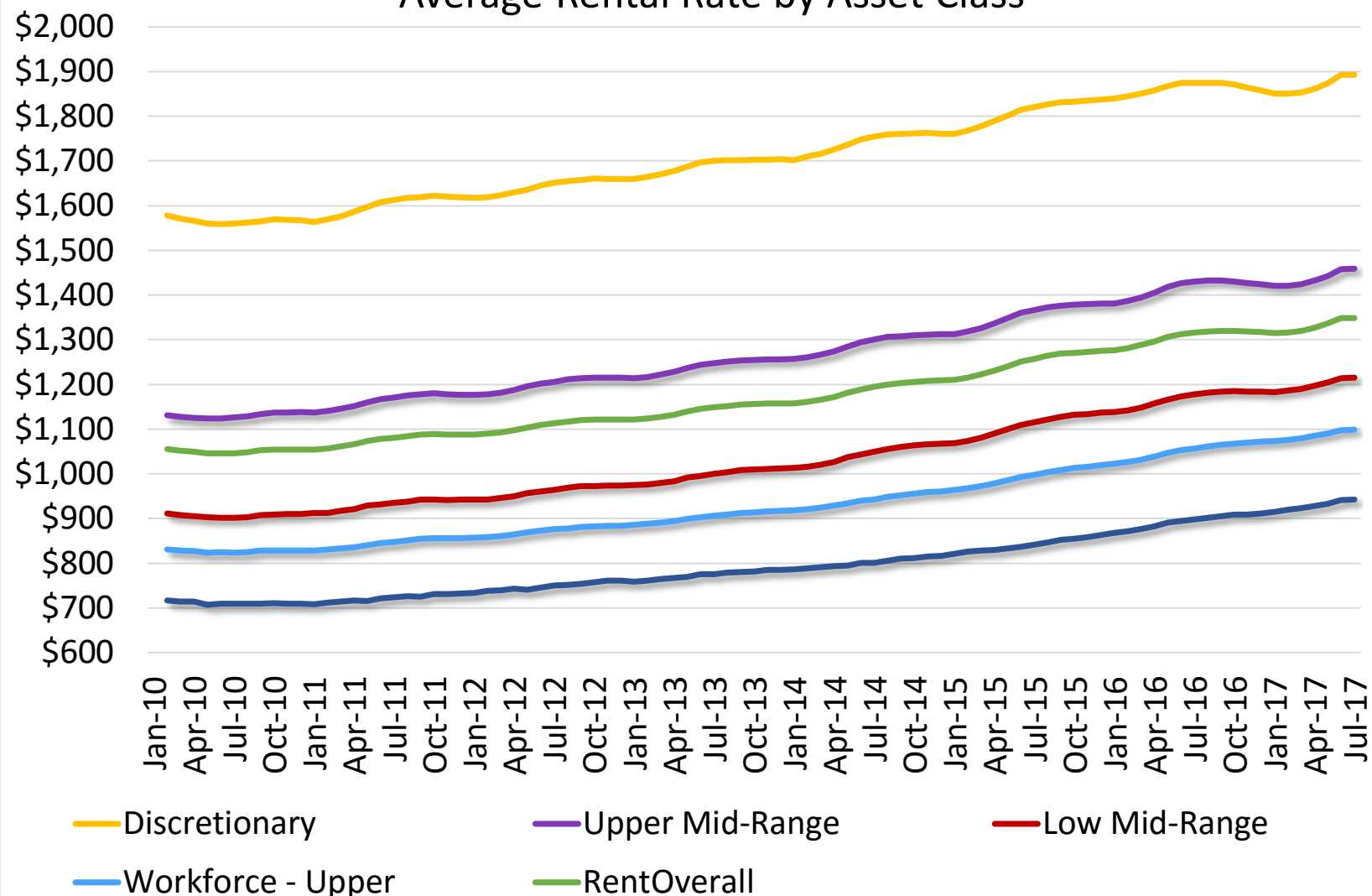


Rent Growth is Recovering While Occupancy Drops



Rent Spreads Have Rebalanced to Historical Norms

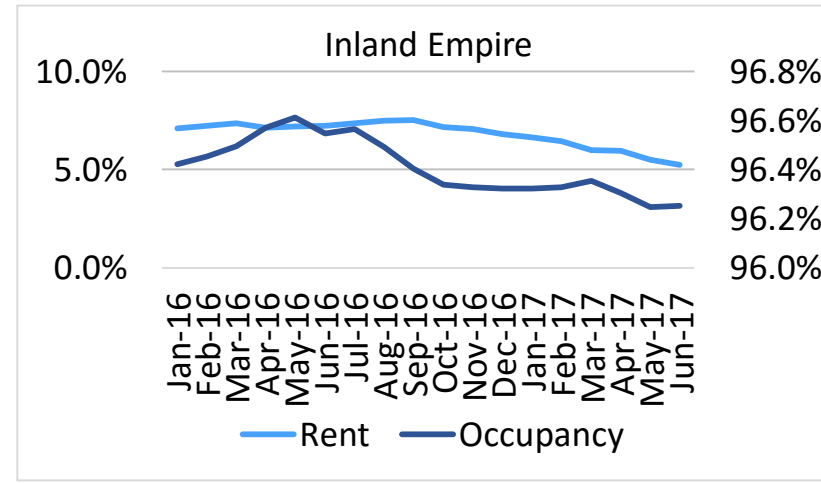
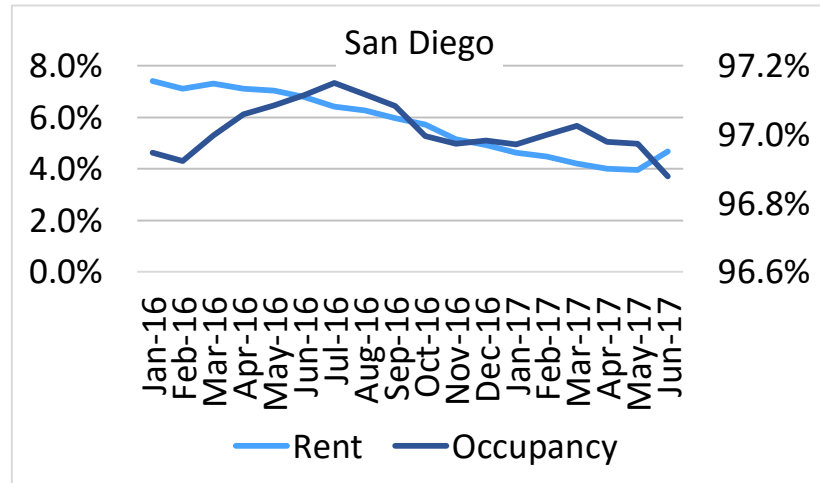
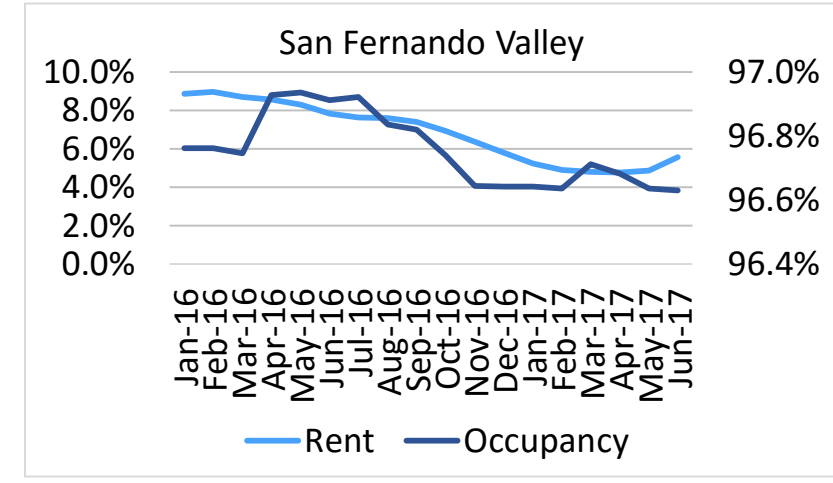
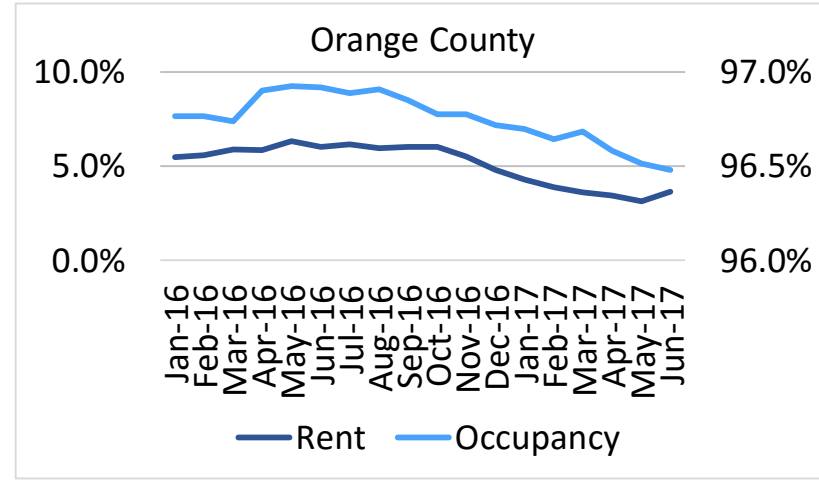
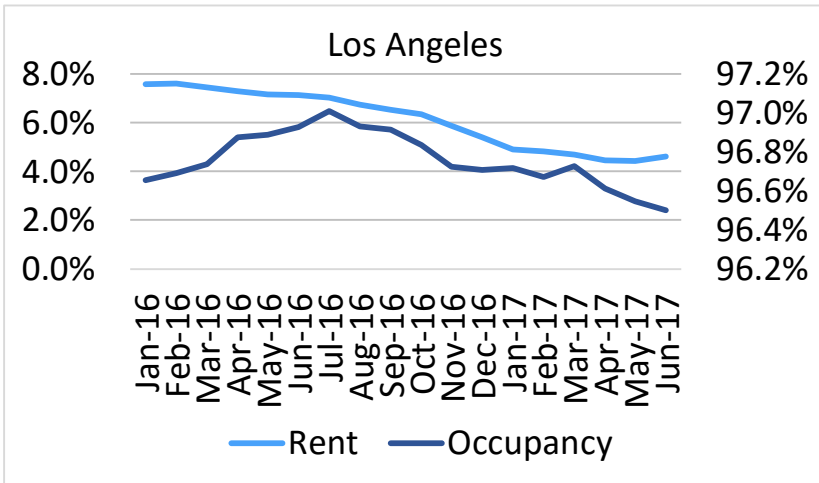
Average Rental Rate by Asset Class



2010-2017 CAGR	
3.1%	Discretionary
4.3%	Upper Mid-Range
4.9%	Low Mid-Range
4.7%	Workforce - Upper
4.7%	Workforce - Lower
4.1%	Overall

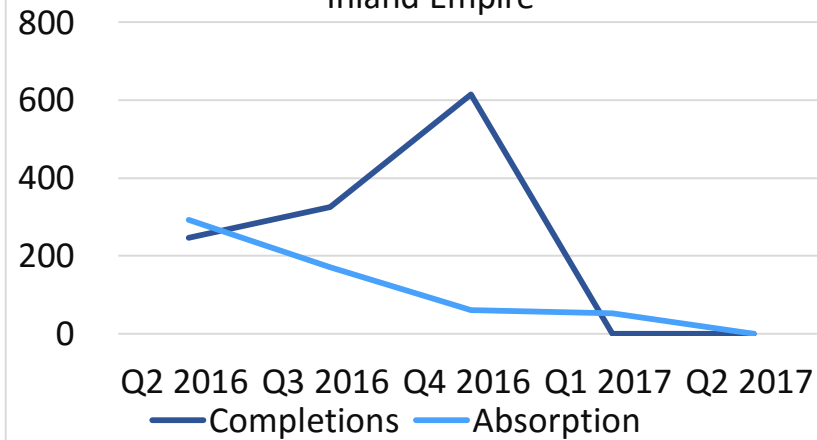
	July 2010	July 2017
Discretionary-Upper-Mid	\$441	\$434
Discretionary-Lower-Mid	\$661	\$678

Rent Growth and Occupancy: Southern California

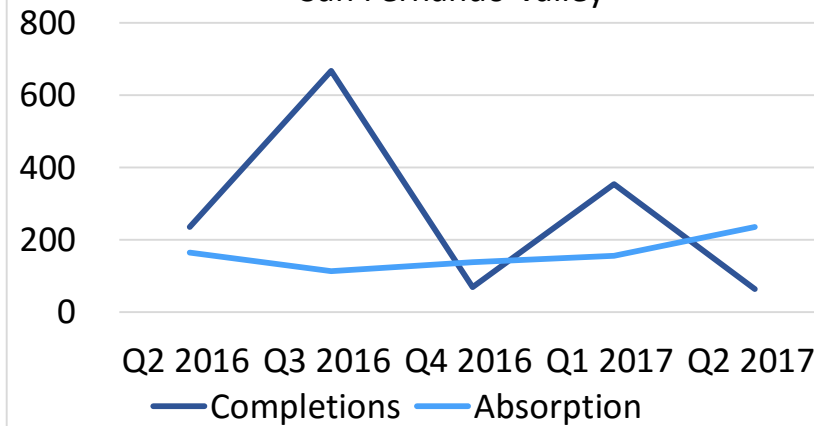


Pre-Lease Occupancy: Southern California

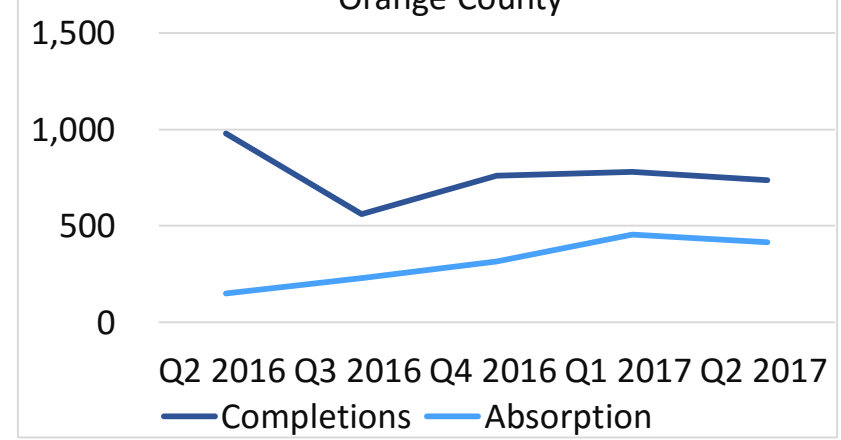
Inland Empire



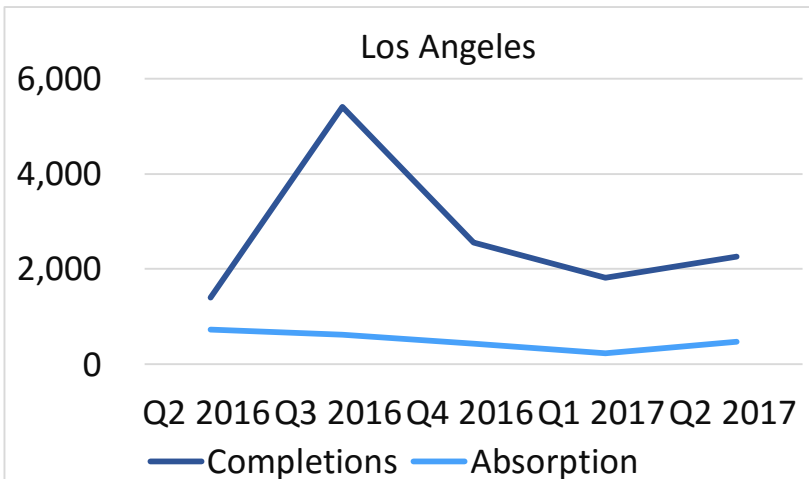
San Fernando Valley



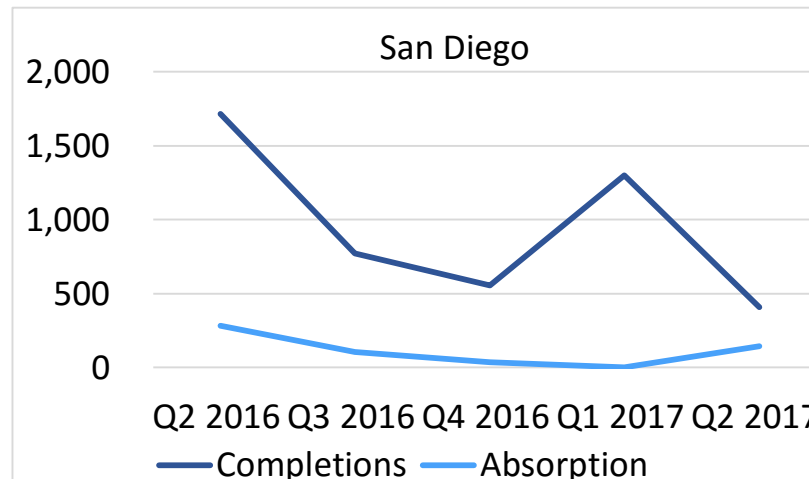
Orange County



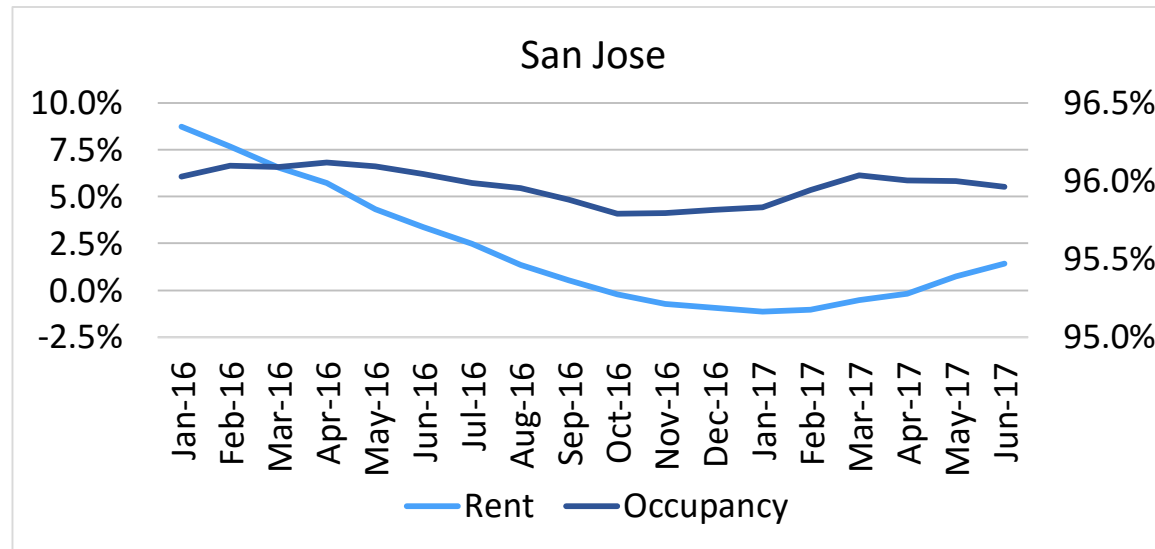
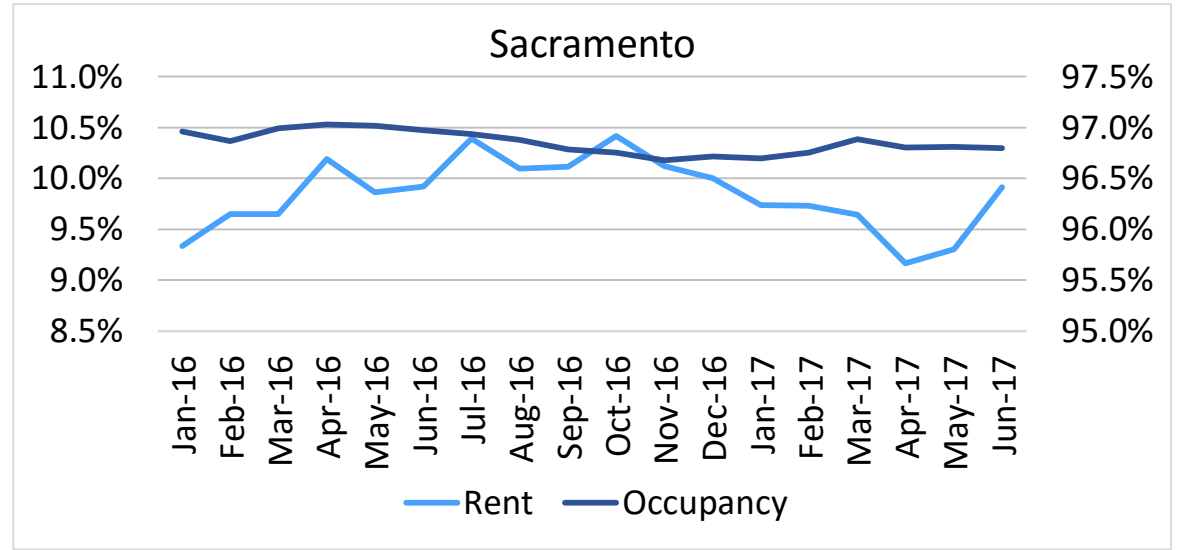
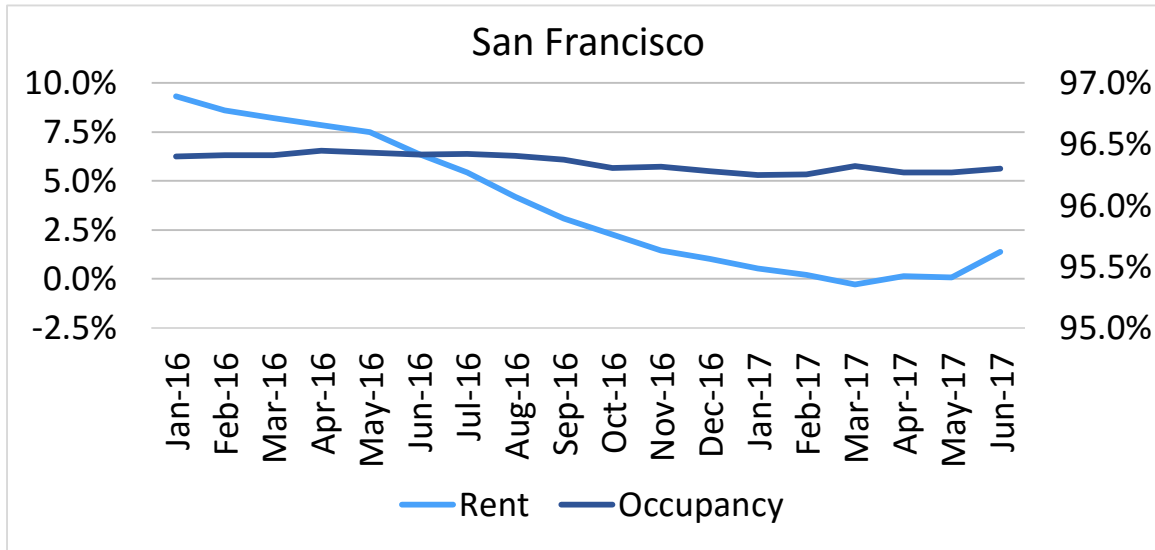
Los Angeles



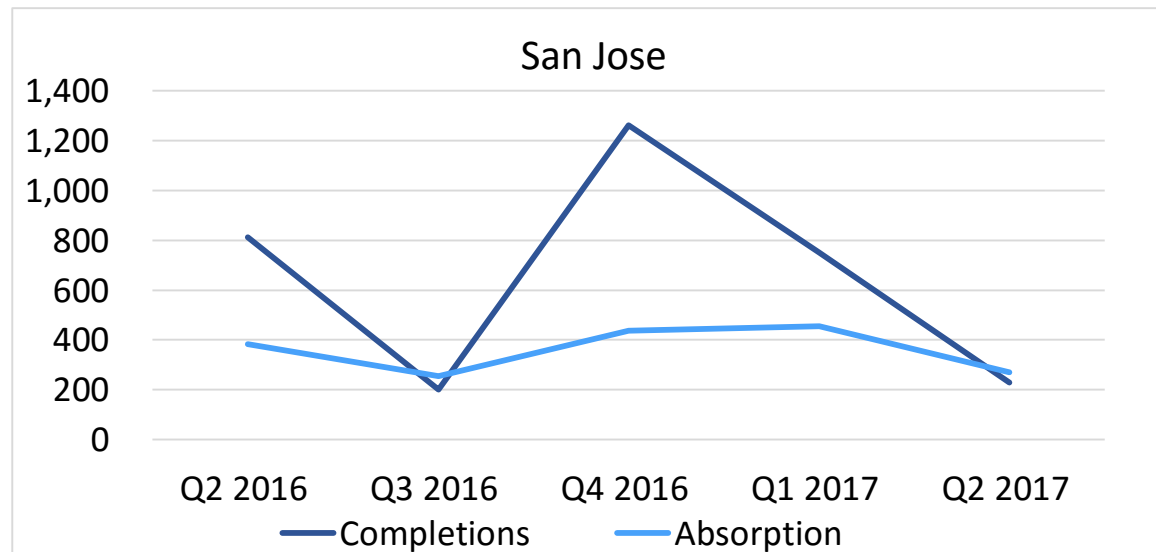
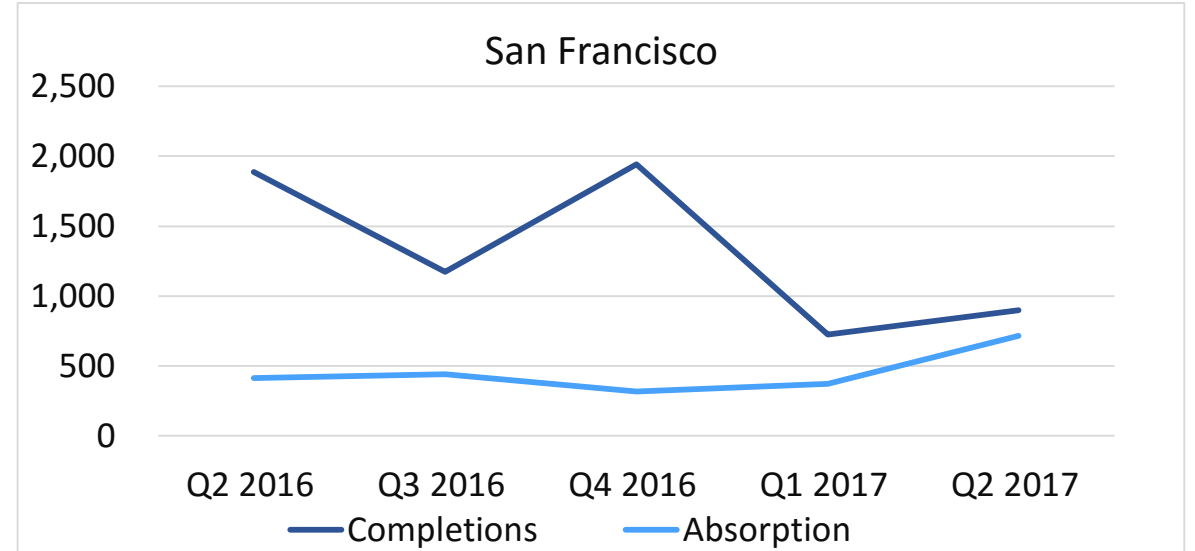
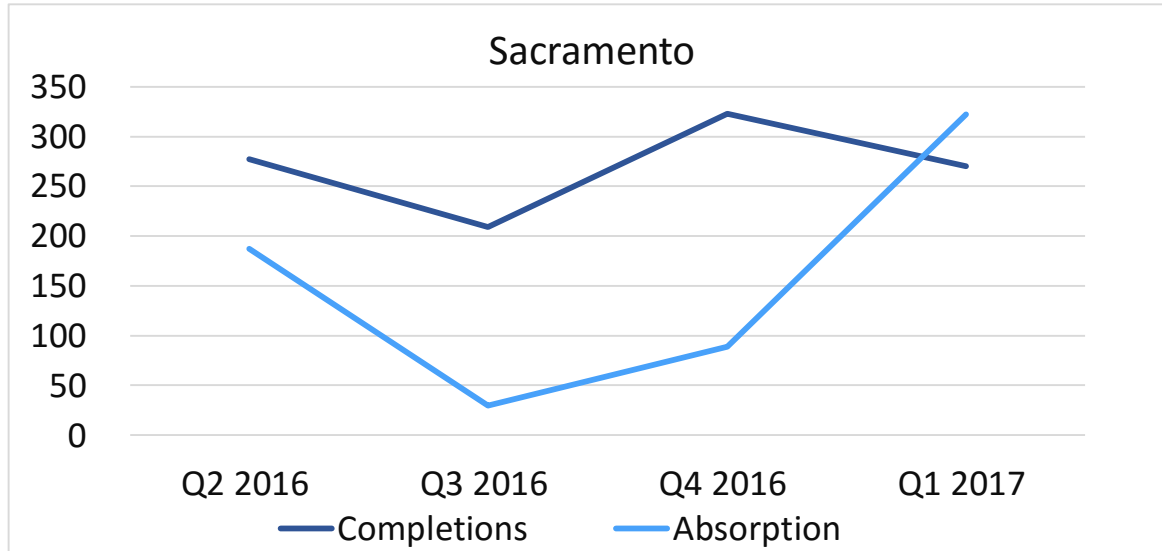
San Diego



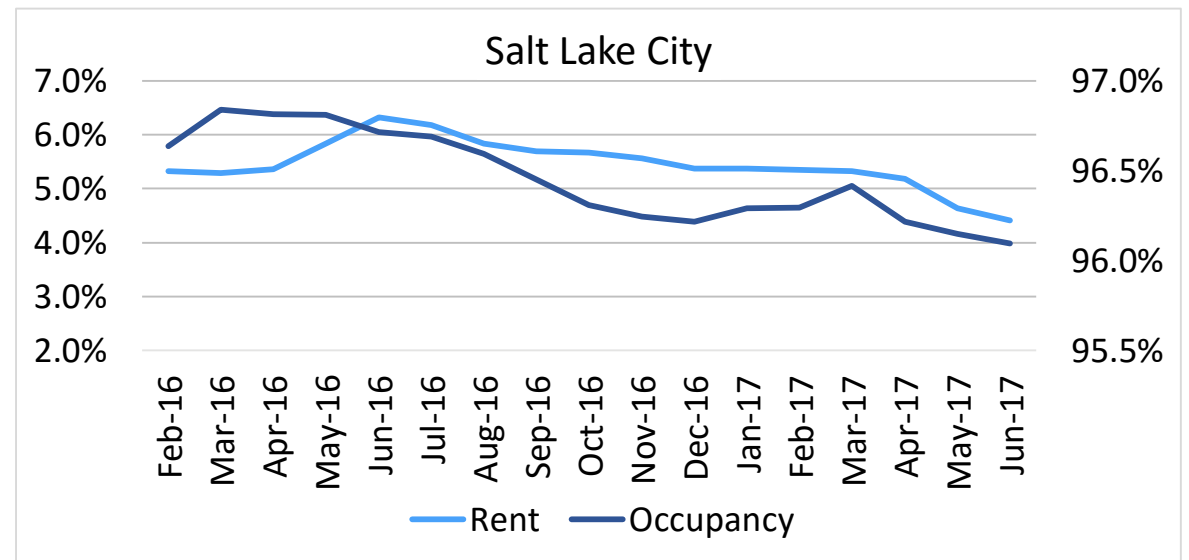
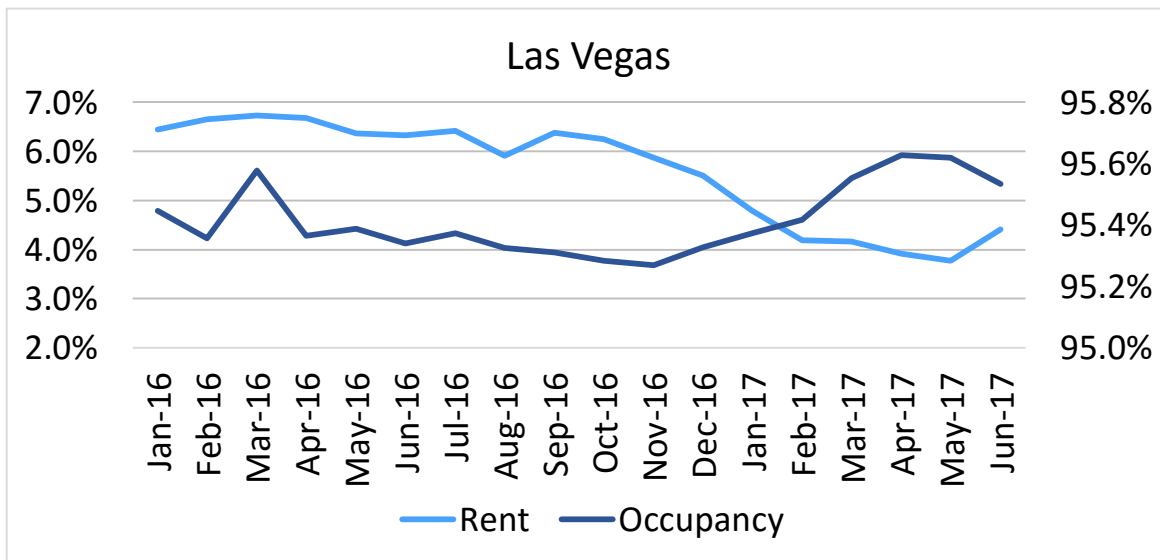
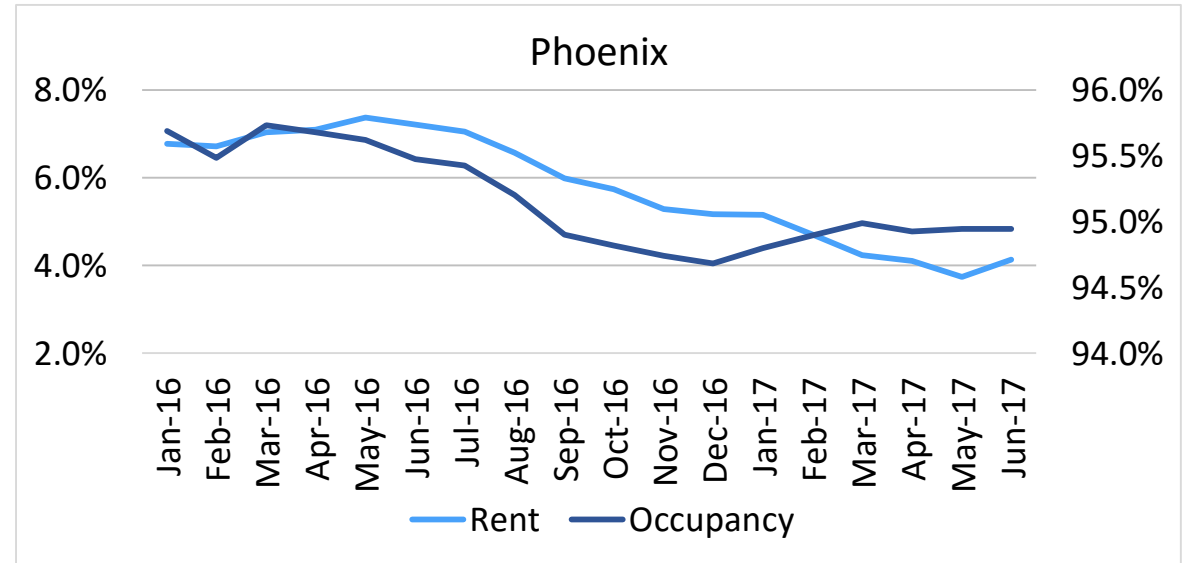
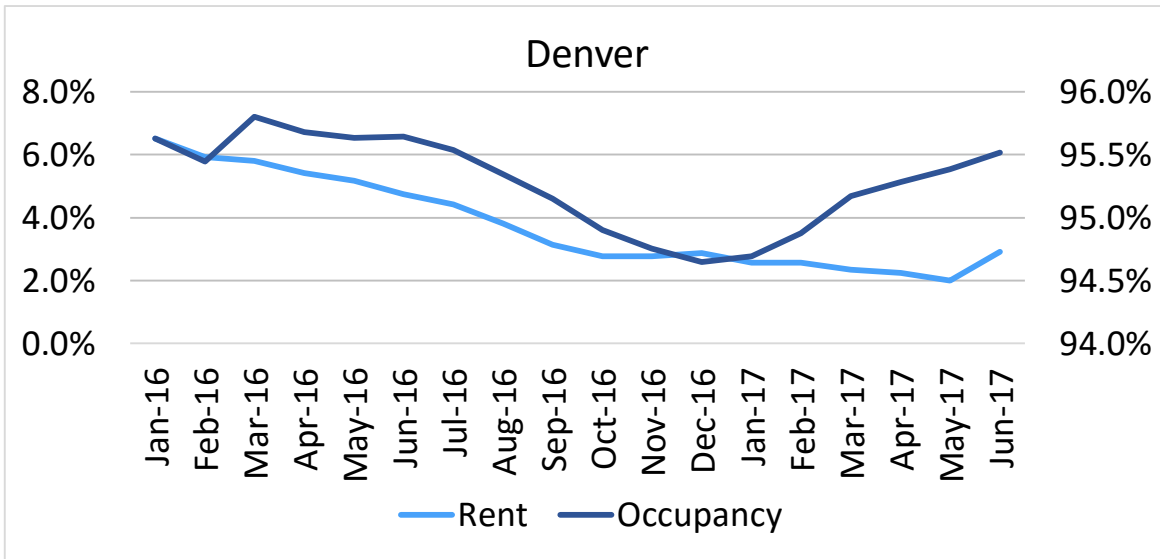
Rent Growth and Occupancy: Northern California



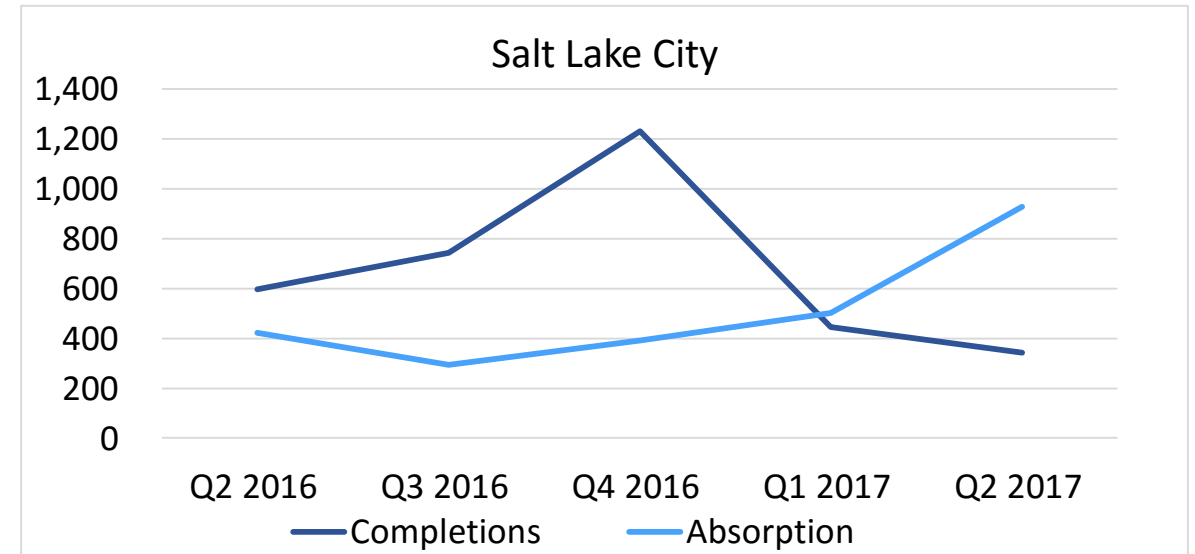
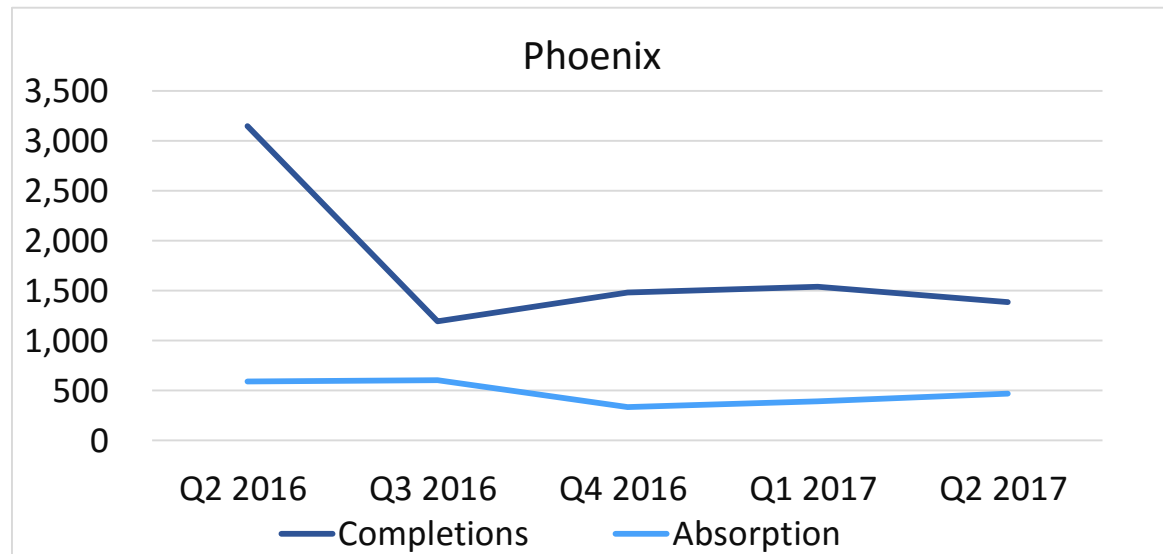
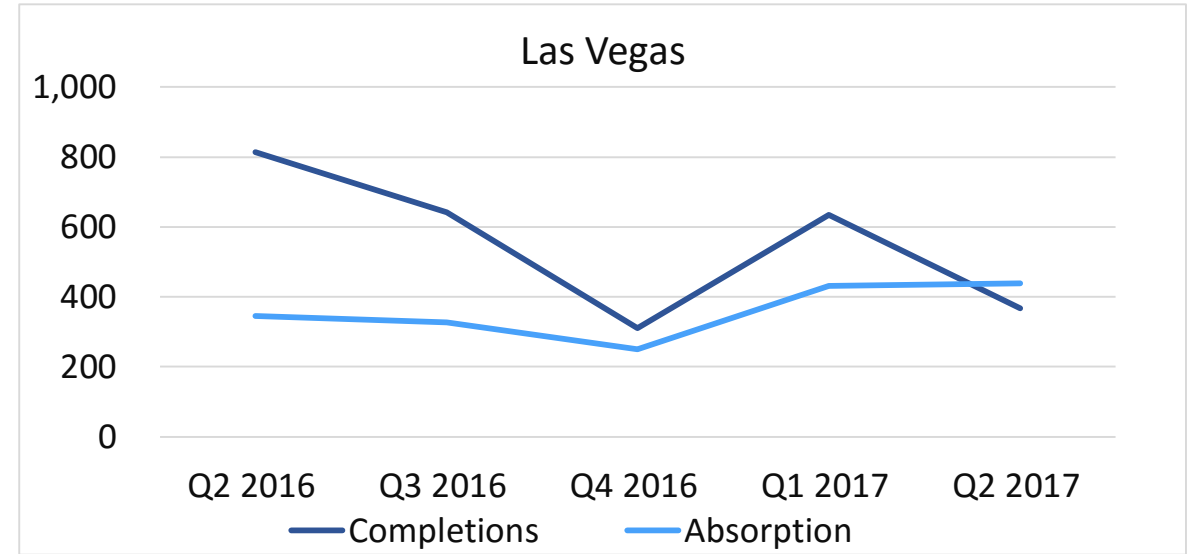
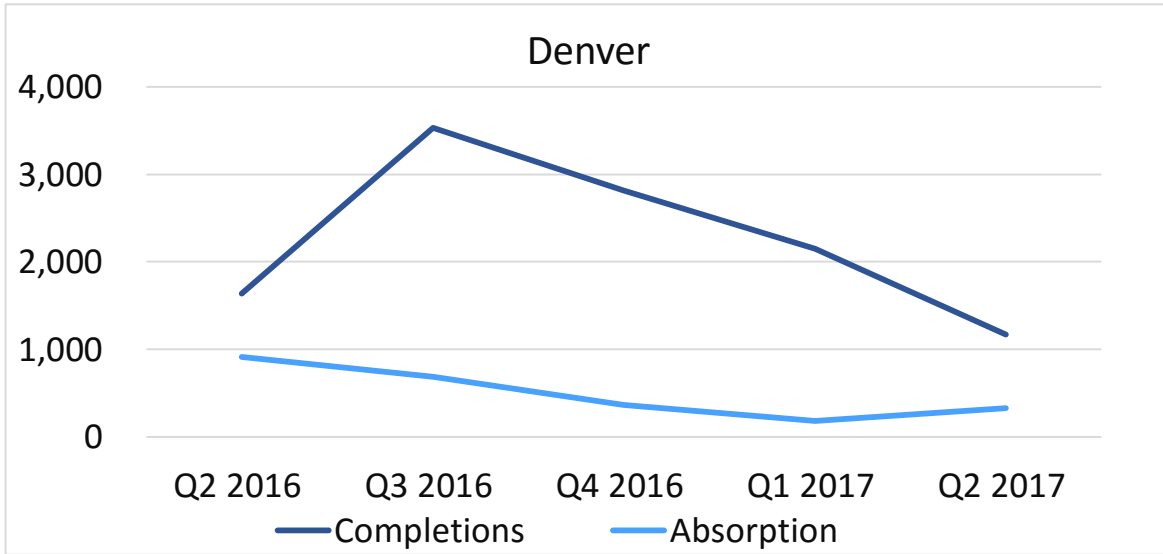
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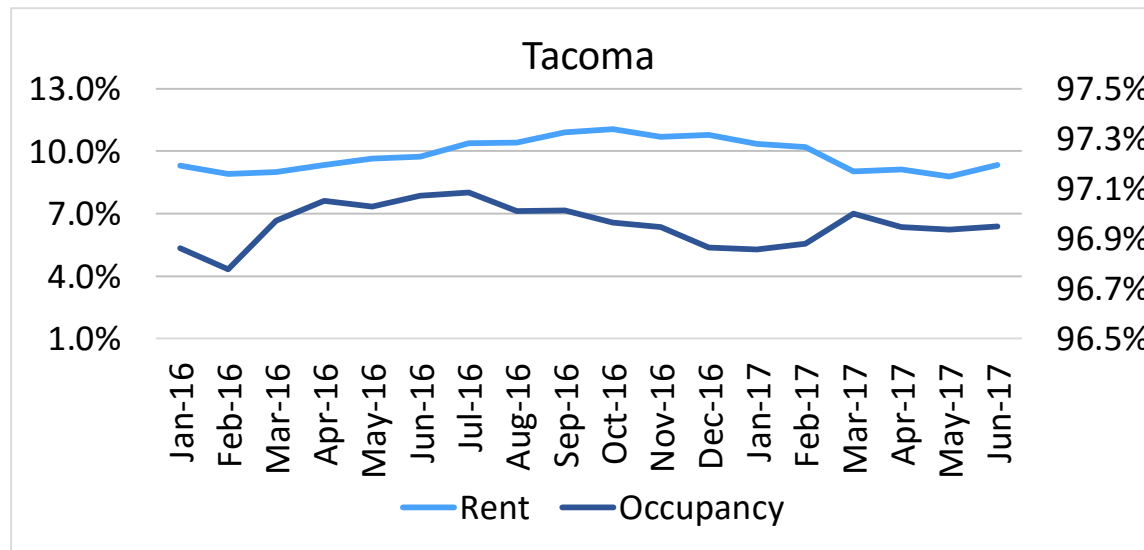
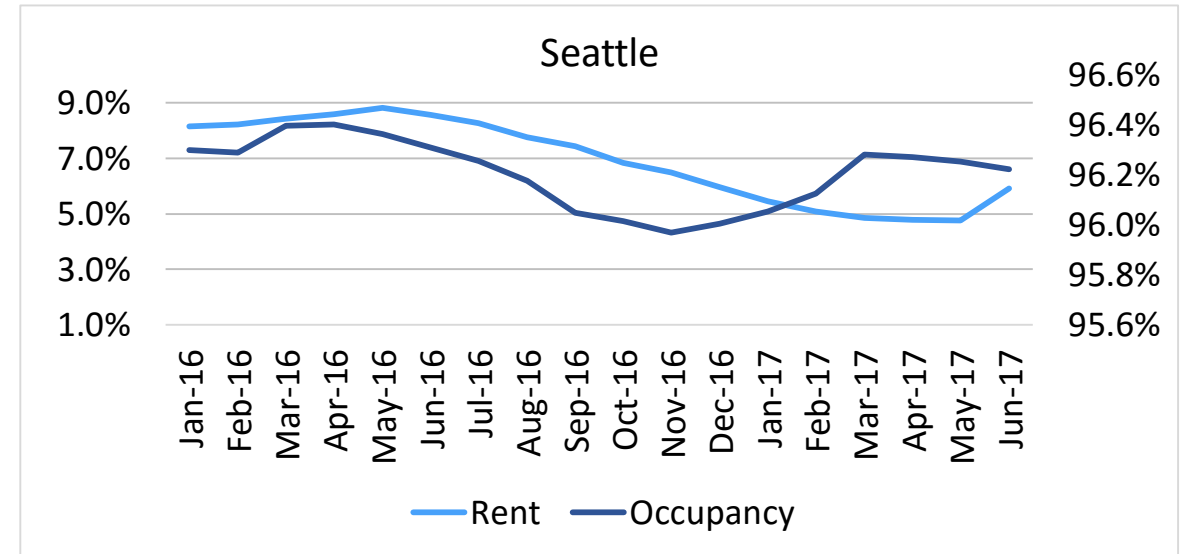
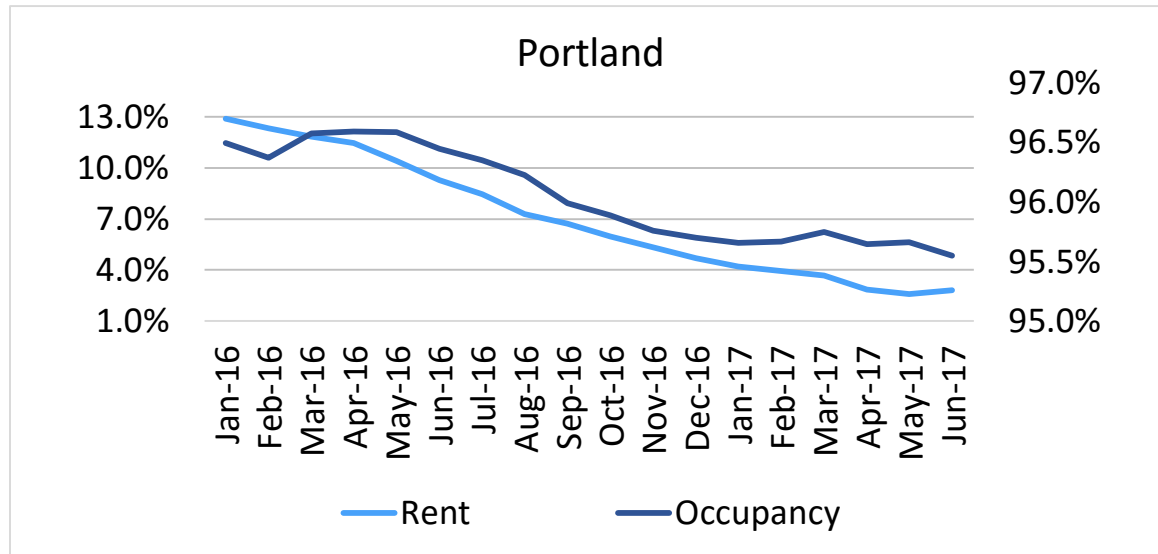
Rent and Occupancy: West



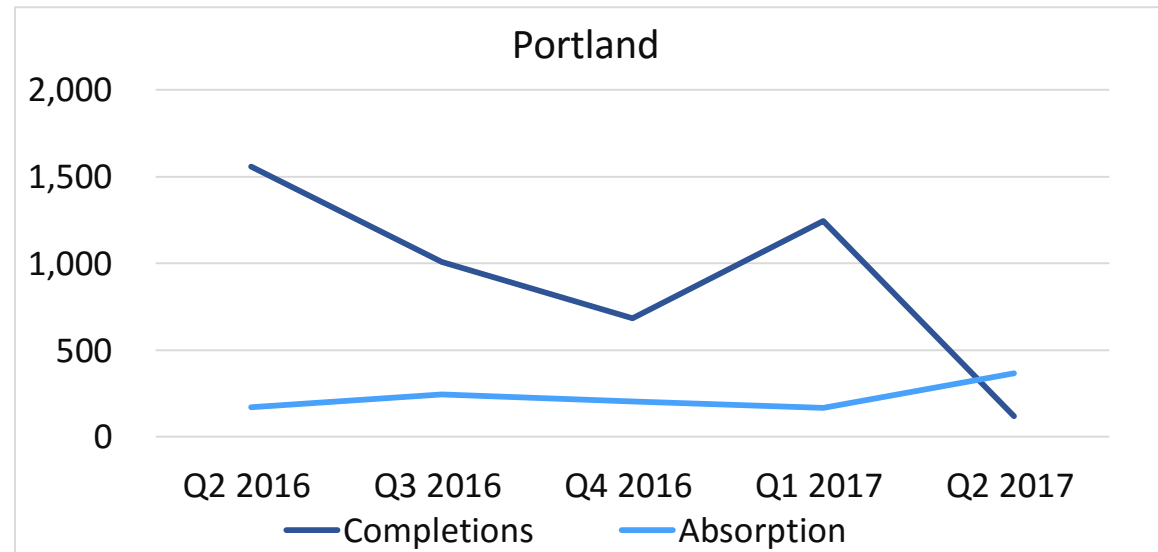
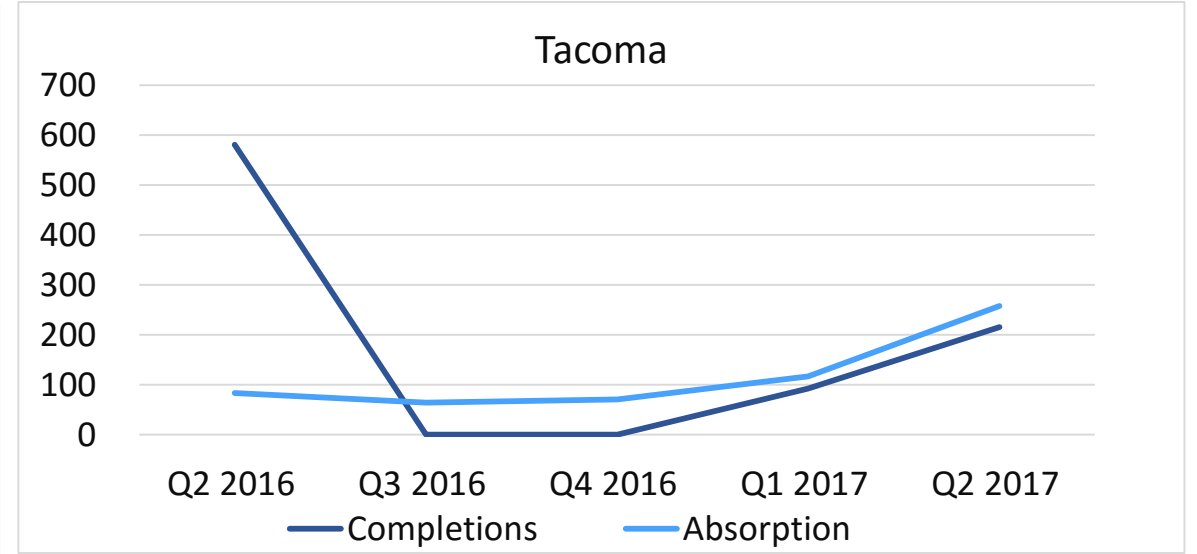
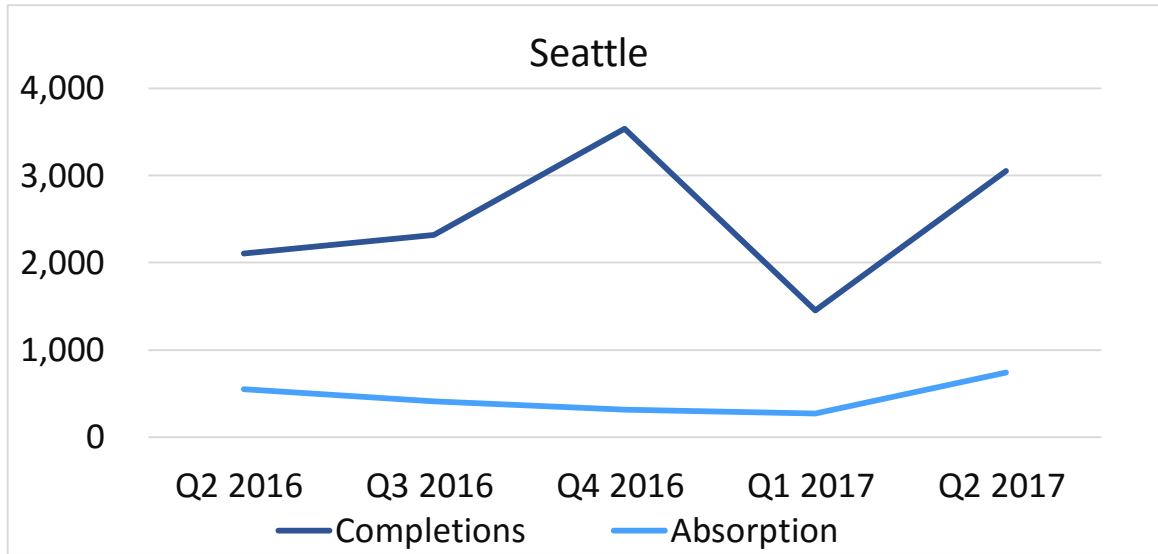
Pre-Lease Occupancy: West



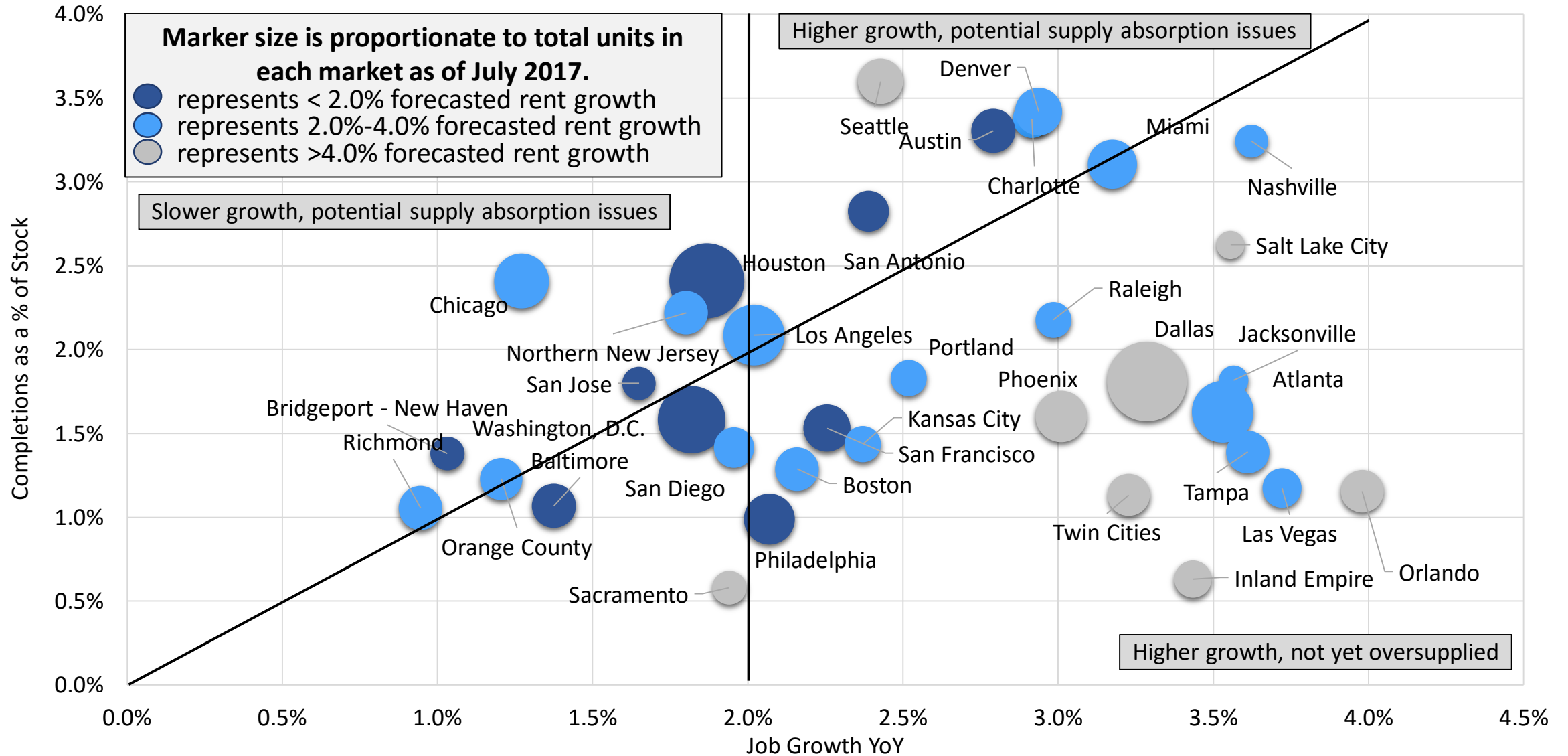
Rent Growth and Occupancy: Pacific Northwest



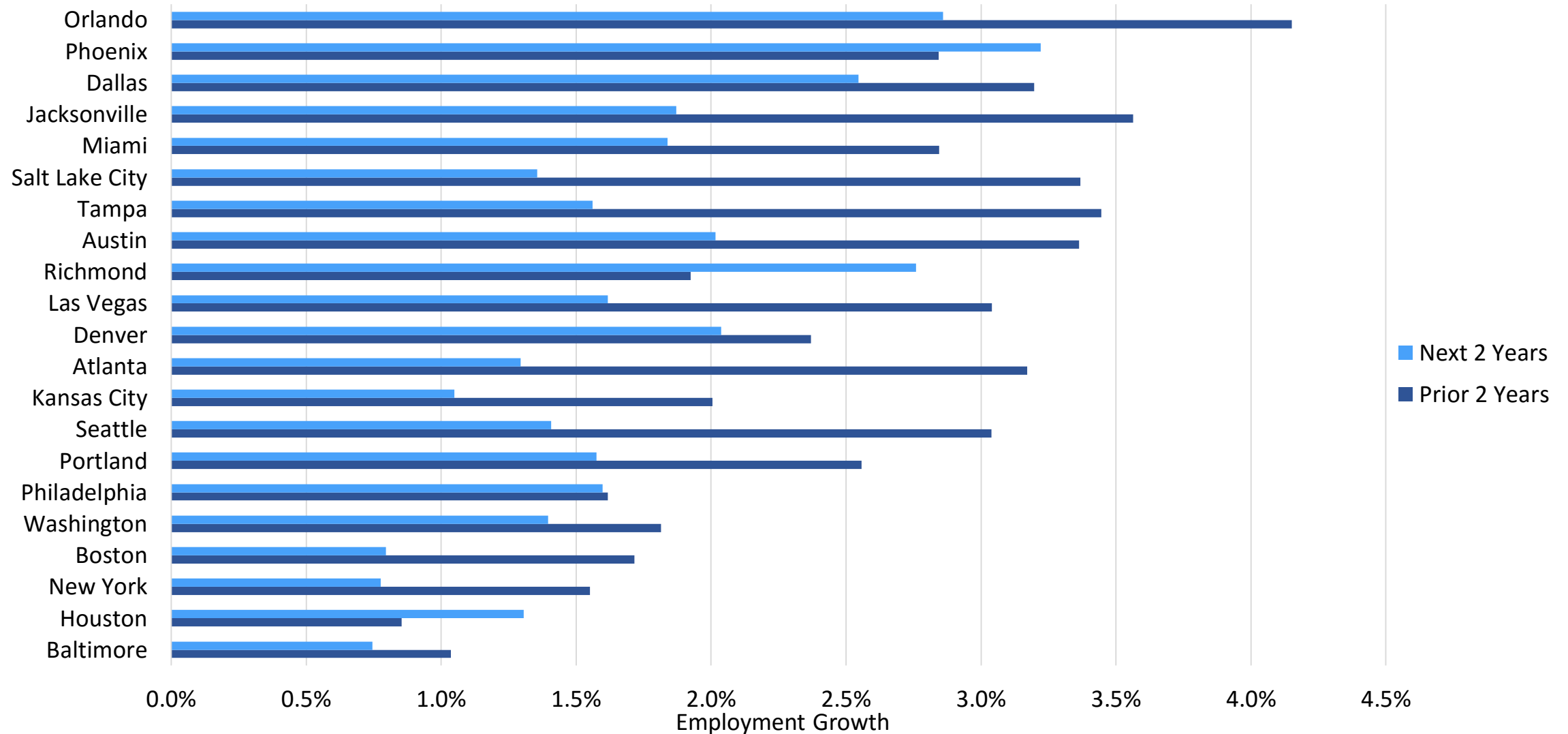
Pre-Lease Occupancy: Pacific Northwest



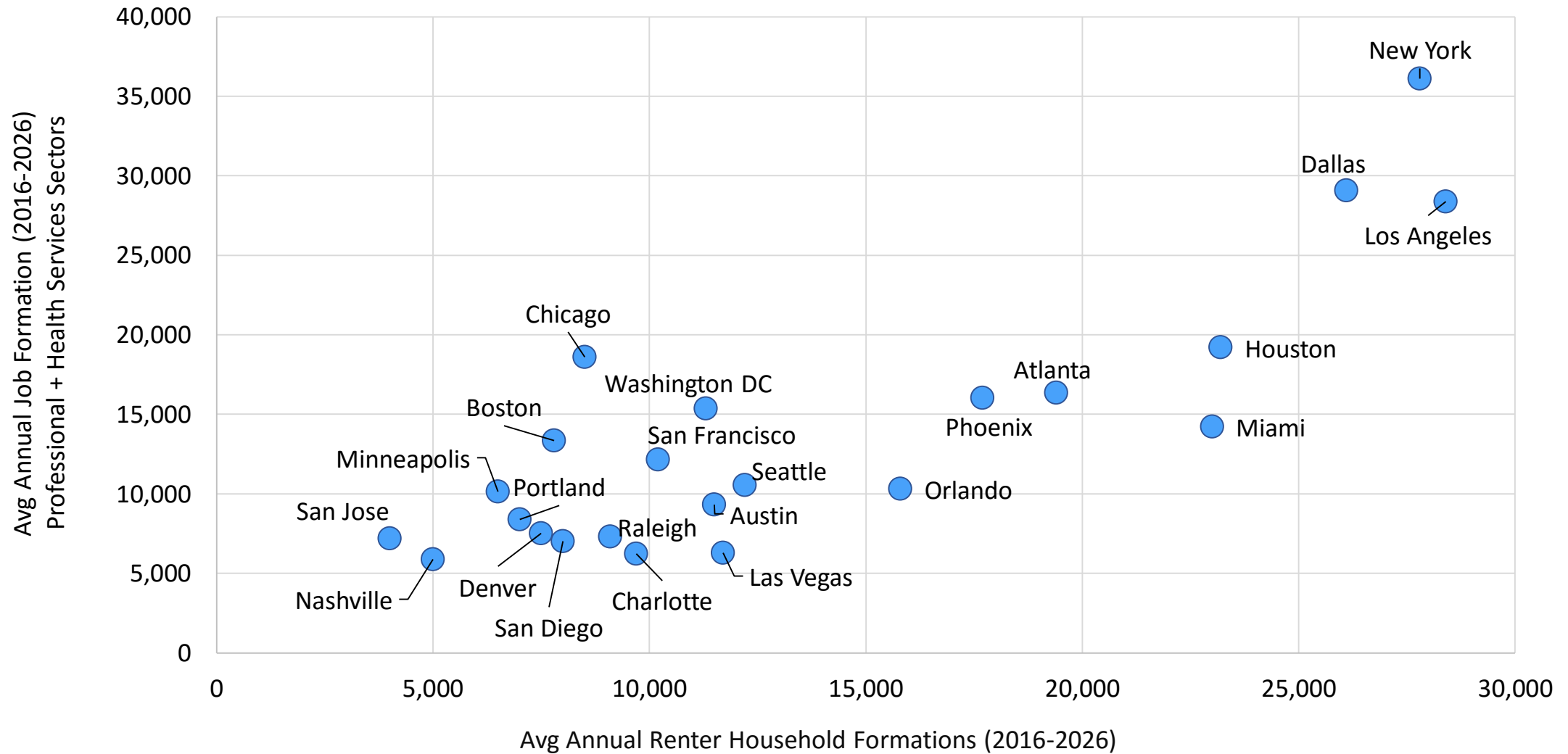
Expect a Bumpy 18-24 months



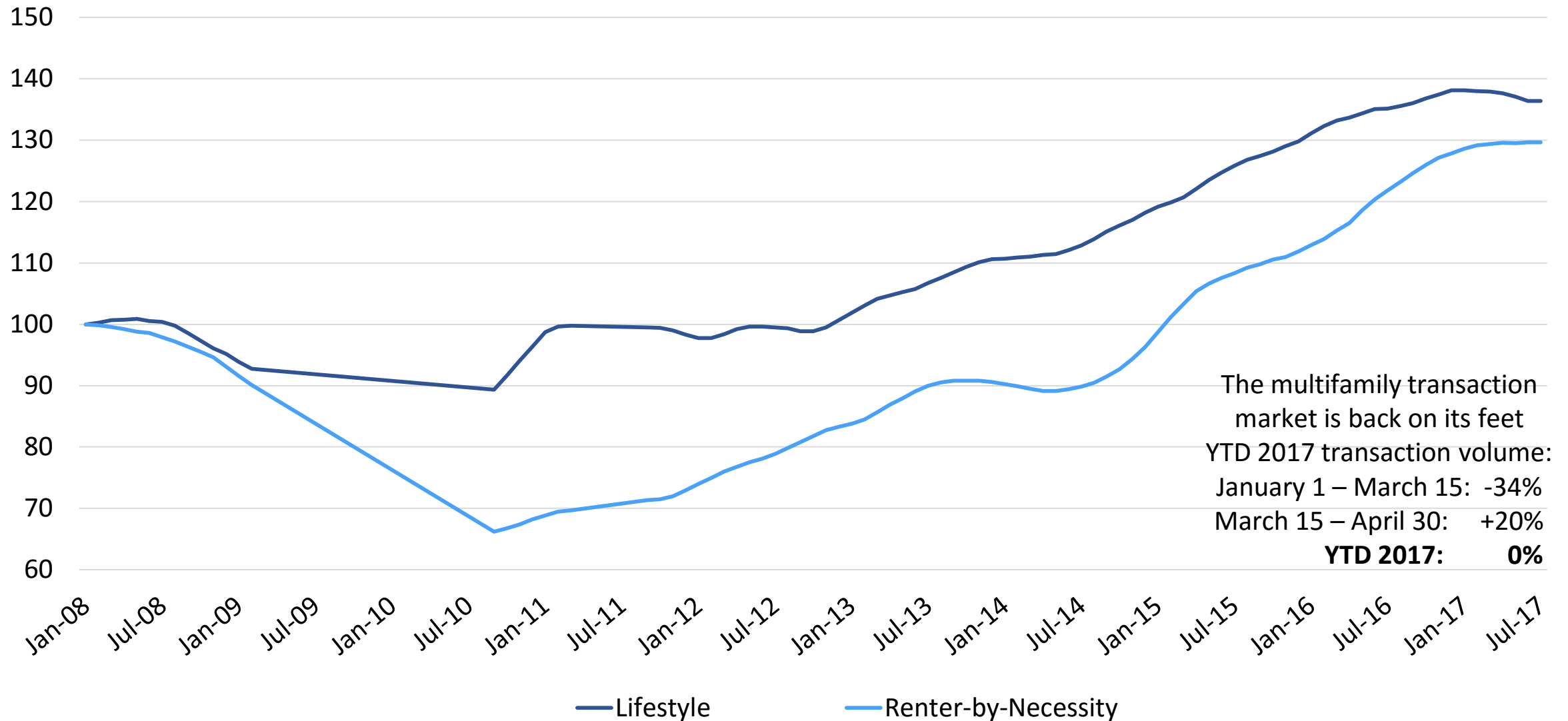
Employment Growth is Expected to Slow Over the Next Two Years



Room for New Supply: Long-Term Job Formation vs Renter Households



U.S. Multifamily Sales Price Per Unit Index 2008-2017



The multifamily transaction market is back on its feet
 YTD 2017 transaction volume:
 January 1 – March 15: -34%
 March 15 – April 30: +20%
YTD 2017: 0%

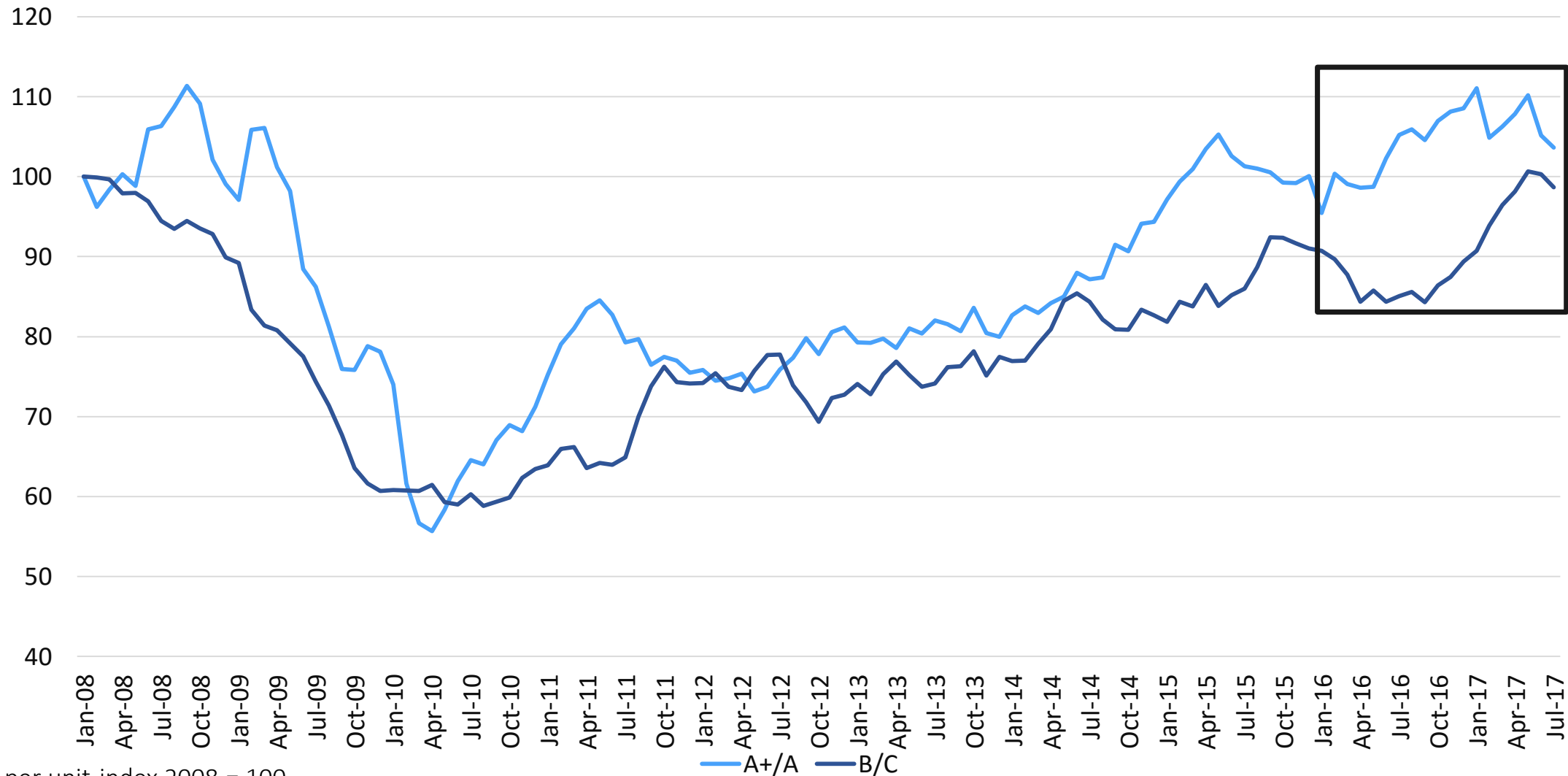
Sales price per unit-index 2008 = 100

Source: Yardi®Matrix



Office Price Per Sq. Ft.

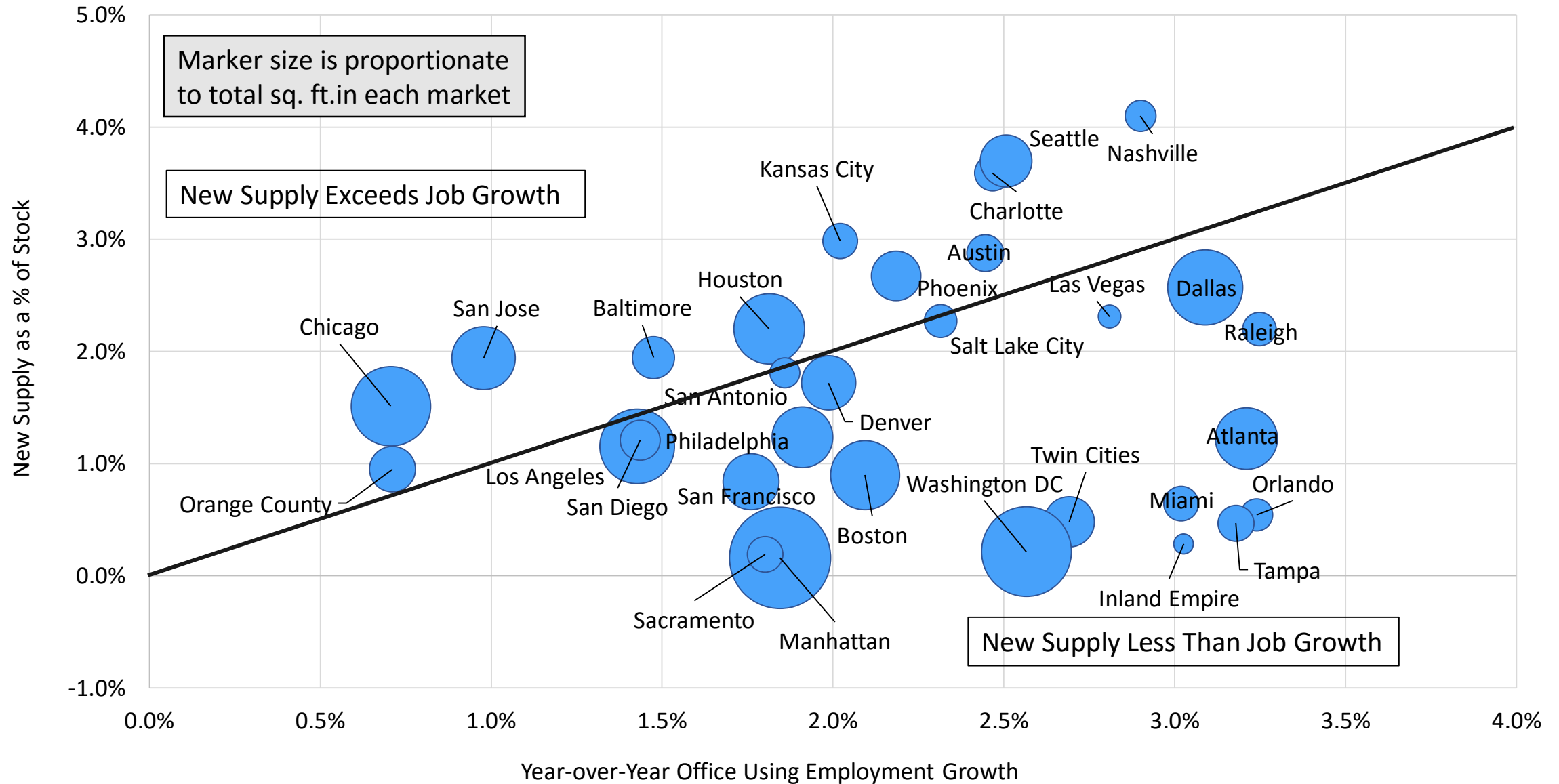
Class A/A+ Has Flattened, While Class B/C Has Steadily Increased



Sales price per unit-index 2008 = 100

Source: Yardi®Matrix

Office-Using Employment Growth Outpacing Supply

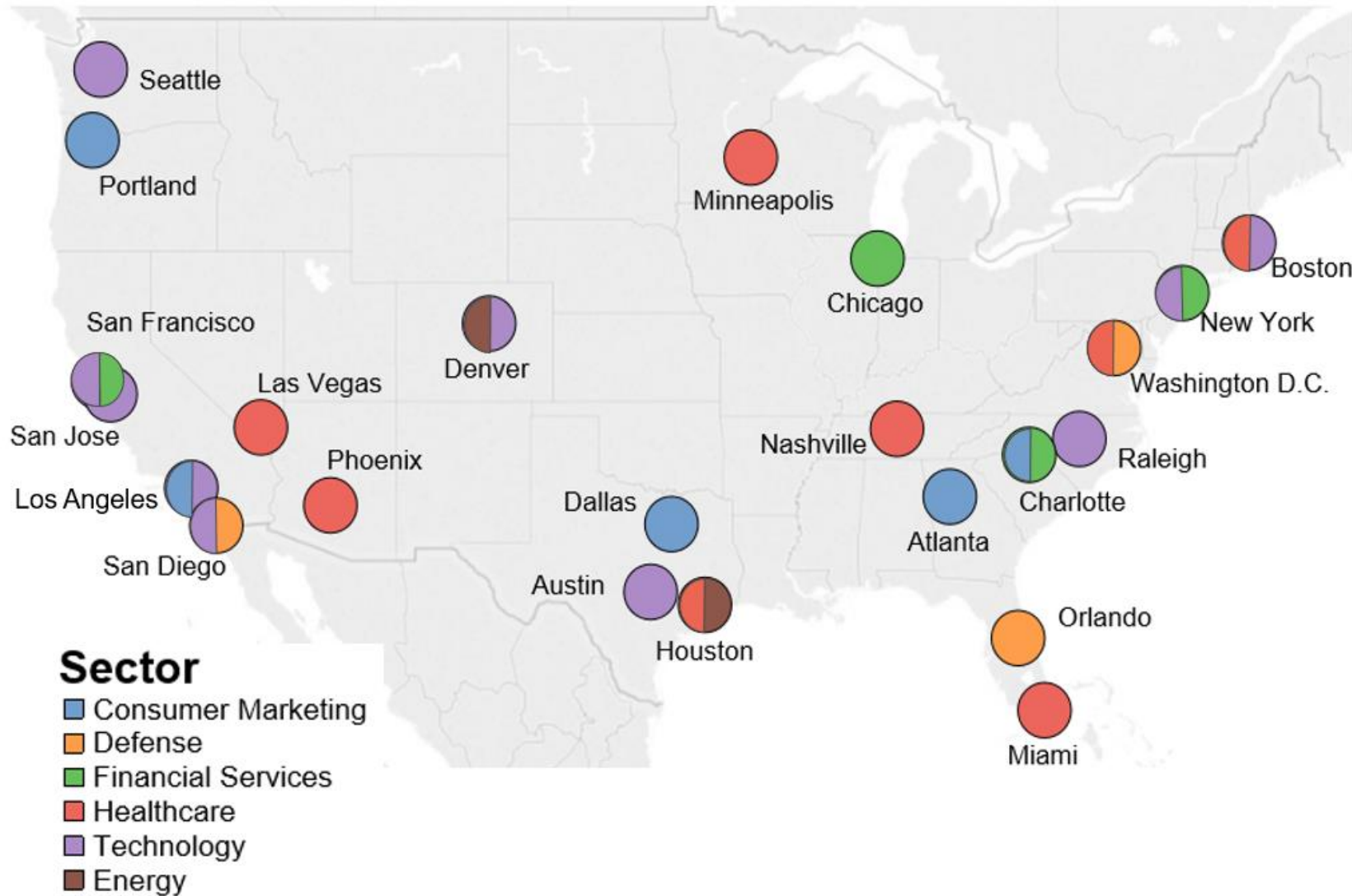


So What? Real Estate Fundamentals

- The next 18-24 months will be a “slow-grind” while this new supply gets absorbed
 - Class A urban most impacted
 - Class B will also be impacted, to a lesser degree
 - International gateway cities most impacted, inland lower-cost cities less so
- Asset value appreciation will be very closely linked to cash flow generation
- Move to suburban “urbanized” nodes already underway
- Operational efficiency should be the main near-term objective in all its forms
 - Marketing Spend, Maintenance Expense, Turn Costs, Energy, Retention, Pricing Efficiency

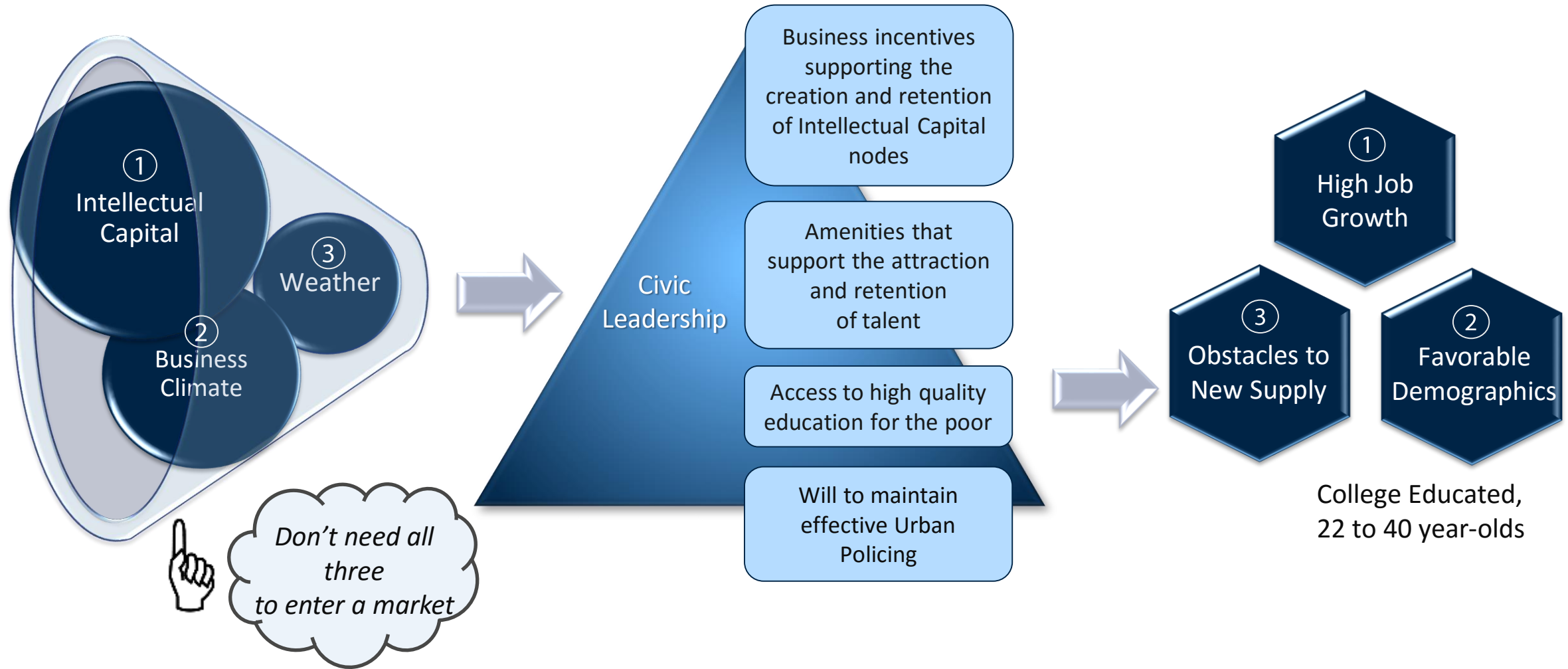
Technology, Demographics, Migration and Immigration

Our “Curated” Markets

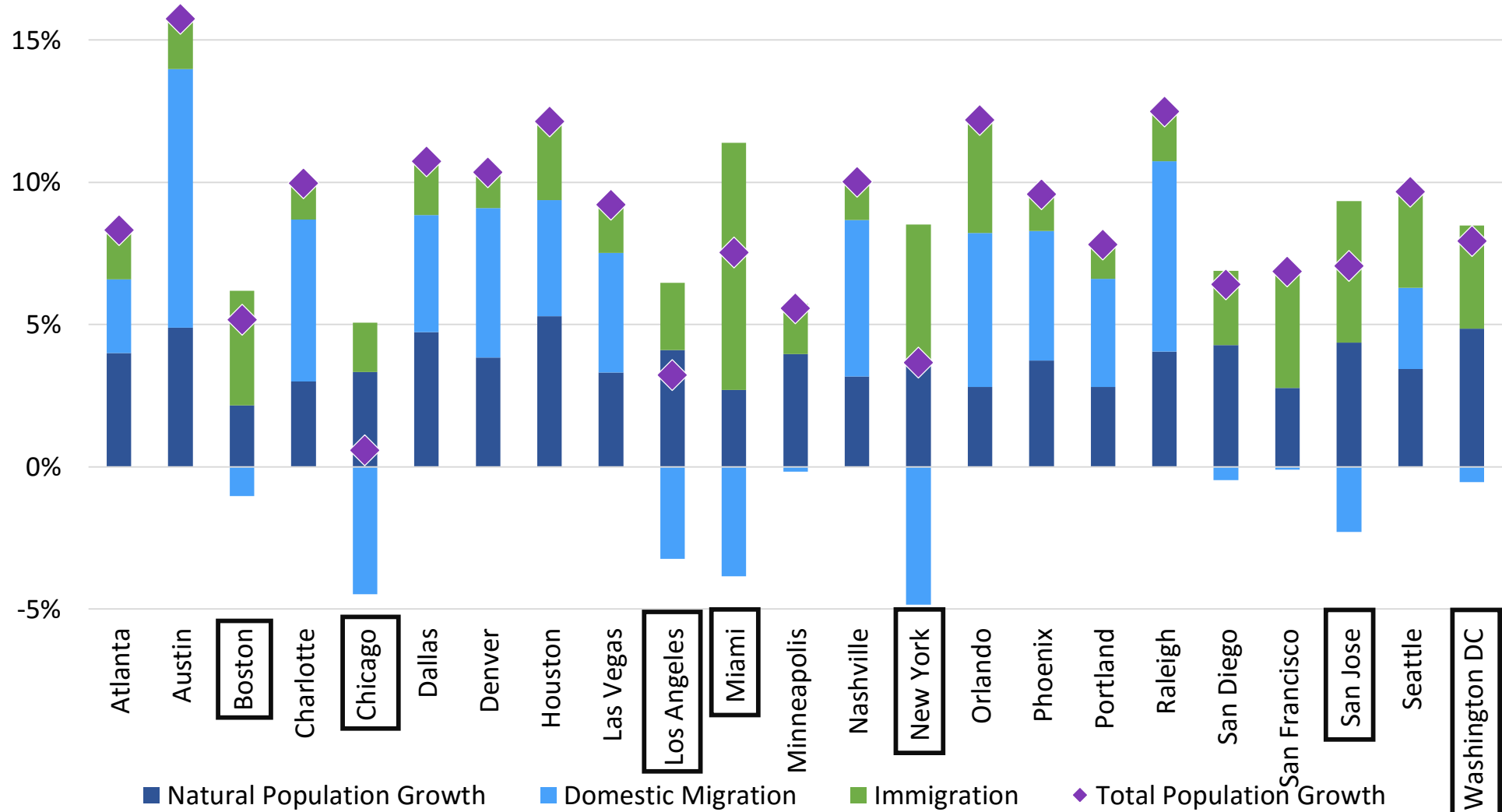


- Based on population growth
- Driven heavily by growing tech, financial services, health care, universities, consumer marketing – Intellectual Capital
- Mostly in “Smile” States, with exception of a few Midwestern Markets

The Investment Decision-Making Process



Foreign Immigration Drives International Gateway City Growth



*2011-2016

Source: U.S. Census Bureau (BOC); Moody's Analytics

Gateway Cities Exposed

International cities' net migration deficit is only made up by immigration.

Within that, certain industries and cities are impacted by specific programs:

H1-B /EB-5

- San Francisco
- Boston
- New York
- Washington, D.C.

Industries Affected

Tech, Finance
Tech, Healthcare
Finance, Tech
Healthcare, Defense

Certain cities, while not international gateways, are exposed to a lesser degree:

H1-B /EB-5

- Seattle

Industries Affected

Tech

Restrictive Borders

- Miami
- Orlando
- Los Angeles

Hospitality
Hospitality, Construction
Construction

Revamped Immigration System

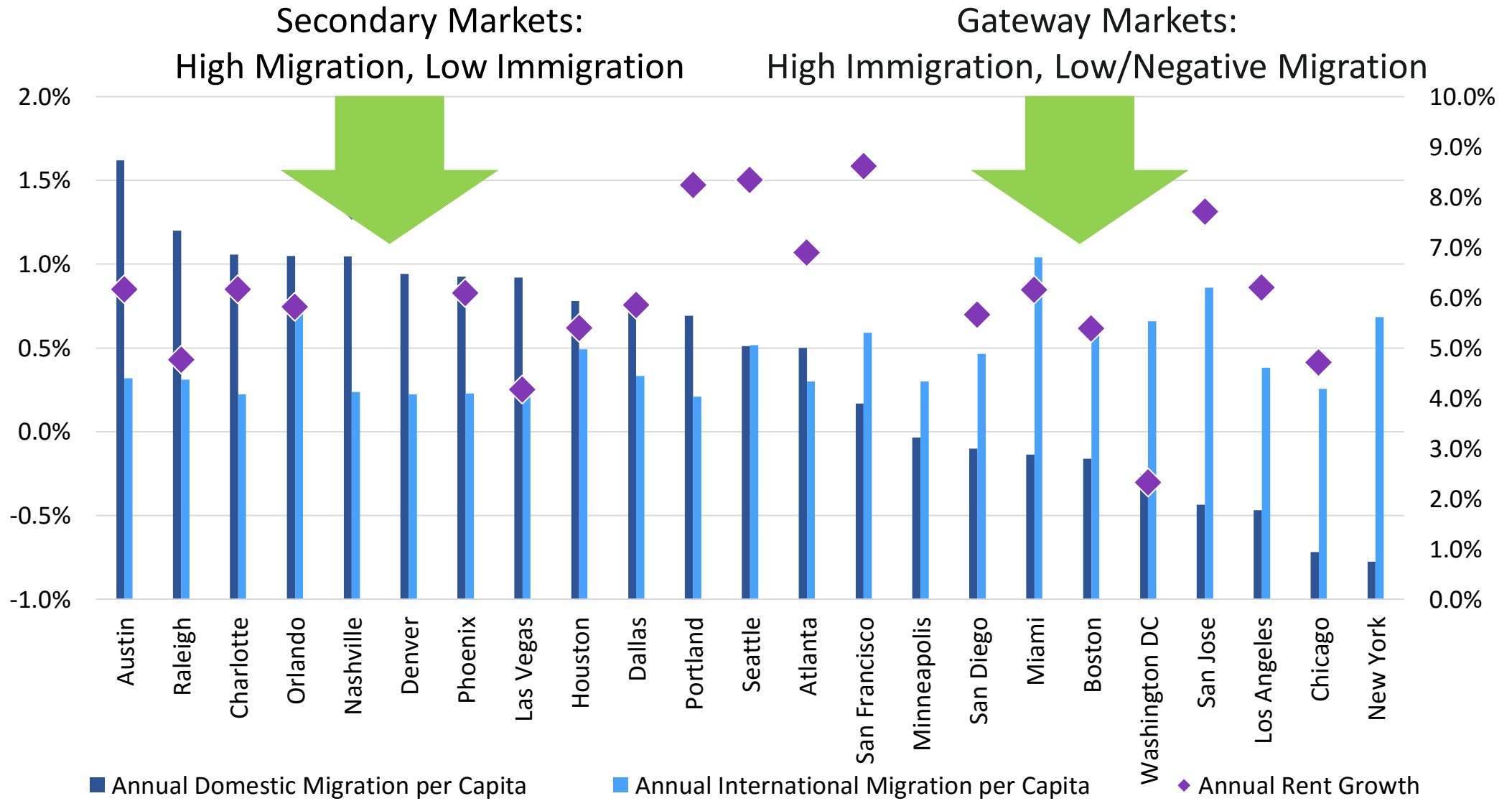
Merit Based Immigration Similar to Canada:

- Foreign nationals may apply for green cards on the basis of educational, intellectual, and personal skills
- Limits “chain migration” of residents bringing family members to U.S.
- Would benefit intellectual capital based markets, and limit unskilled immigration



Actually proposed by Trump Administration
(But with a 50% reduction in immigration per year)

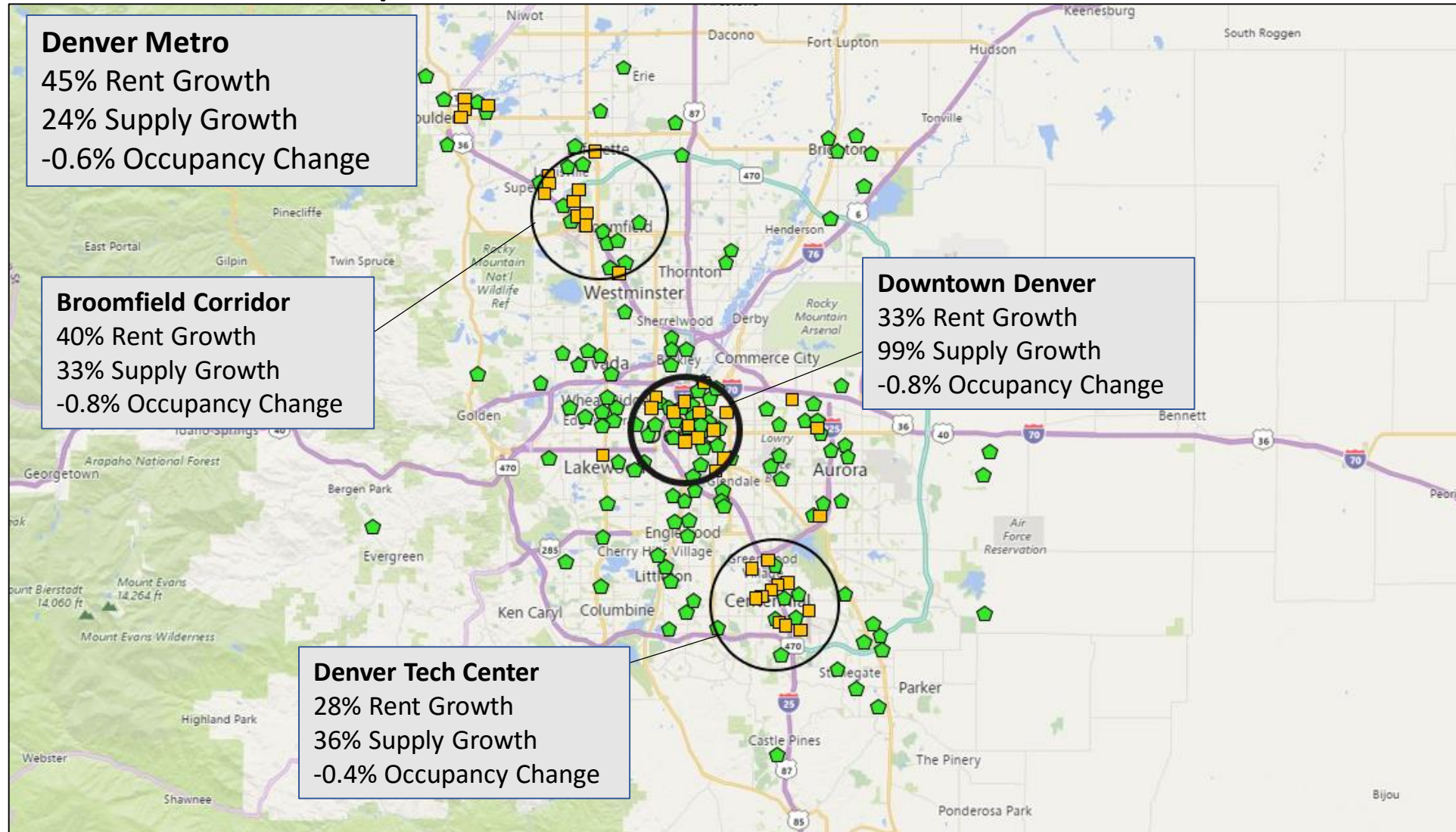
Immigrant vs Domestic Migrant Patterns



*2012-2016 Migration Data

Source: U.S. Census Bureau (BOC); Moody's Analytics; Yardi® Matrix

Intellectual Capital Nodes – Denver



■ Office Development

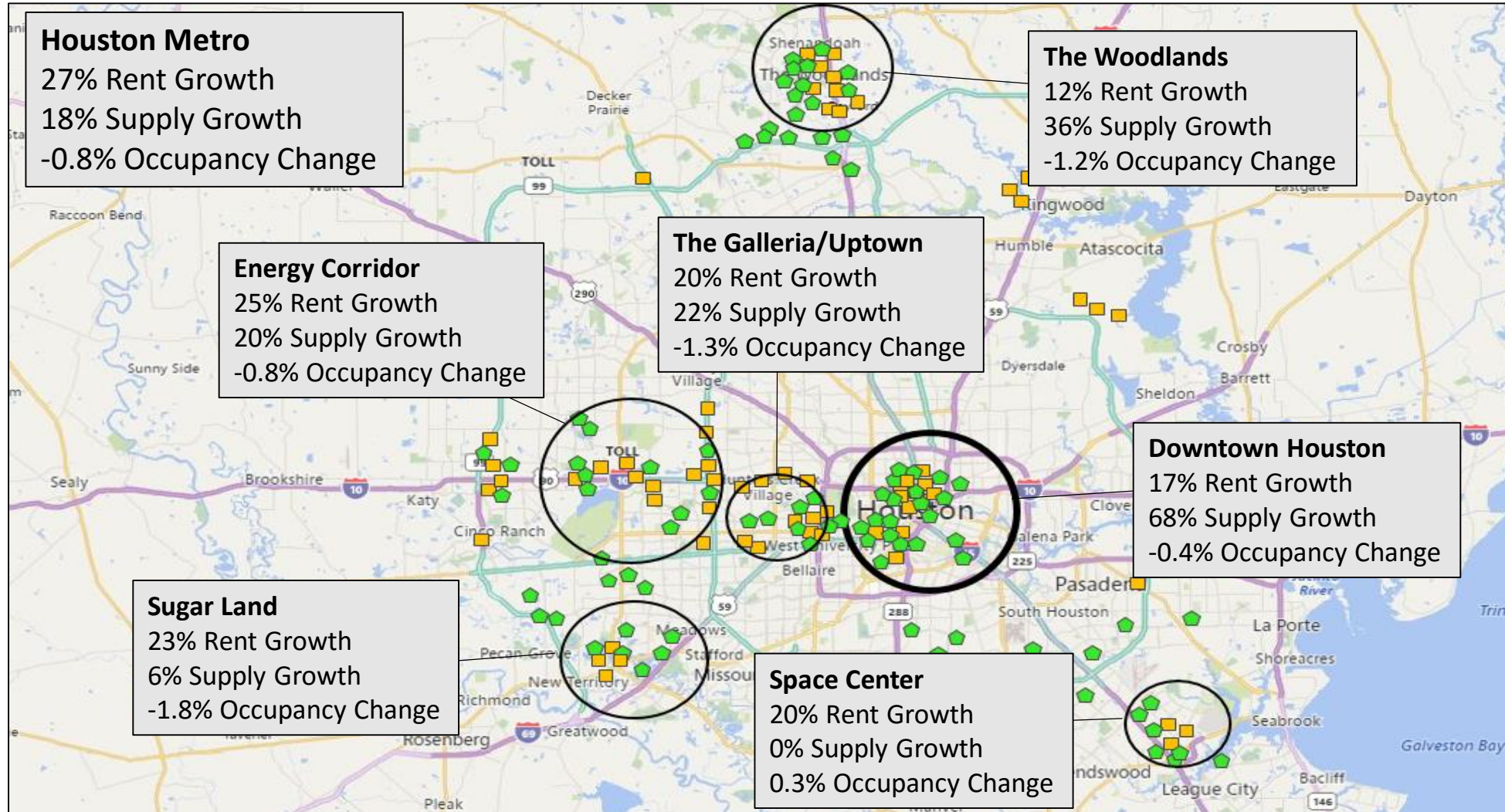
◆ Multifamily Development

* Multifamily rent growth based on May 2012 through May 2017

* Change in multifamily occupancy based on April 2016 through April 2017

Source: Yardi® Matrix

Intellectual Capital Nodes – Houston



■ Office Development

◆ Multifamily Development

* Multifamily rent growth based on May 2012 through May 2017

* Change in multifamily occupancy based on April 2016 through April 2017

Space Utilization is Becoming More Fluid and Flexible

In the future, space will have to be more flexible as the pace of use changes

“Play”

Retail

- Existing lower-end retail will merge with office to salvage value
- More experience-driven and less “things”
- Industrial replaces retail space
- Reimagined malls/entertainment centers/distribution centers

“Work”

Office

- Will merge with retail experiences and short-term living experiences
- Reimagined suburban office parks

“Live”

Multifamily

- Proximity is already important, work and play will become increasingly important in “urban-like nodes” in what has been suburbia
- Flexible use of space and leases

Already Beginning to Happen

Technology's Impact on the Future of Real Estate

- Position where wealth is created and where the value of “place” will increase
- With a focus on live/work/play then “fulfill”/store

Technologies

*Energy

- Solar
- Batteries

*Electric & Autonomous Vehicles

- Lithium-Ion Batteries
- LIDAR Sensors

IoT/Sensors

- Smart home
 - Amazon Echo
 - Nest Thermostat

Artificial Intelligence/Robotics

- Drones
- Virtual Realty

“Taken-for-Granted” Tablestakes

Connectivity

- 1G Connectivity, 40x High Speed
- Mobility
- Security

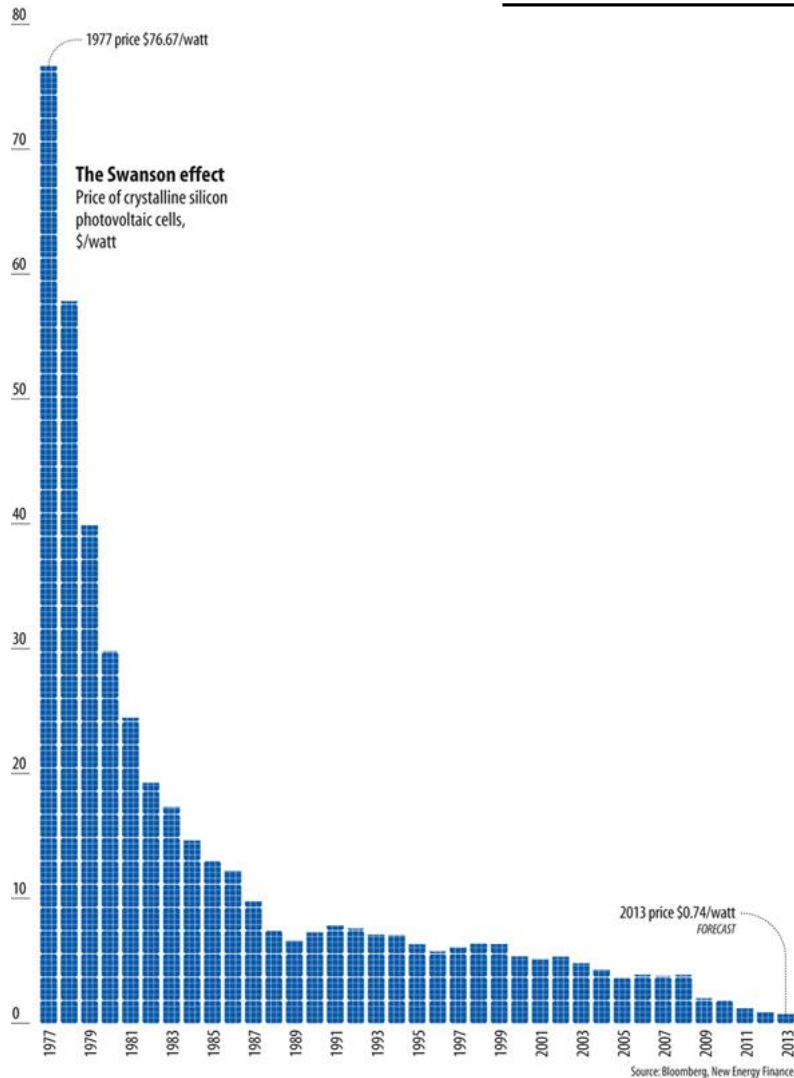
Collaboration

- Mobile apps
- Connectivity and free-up trapped resources

*Focus today on these two

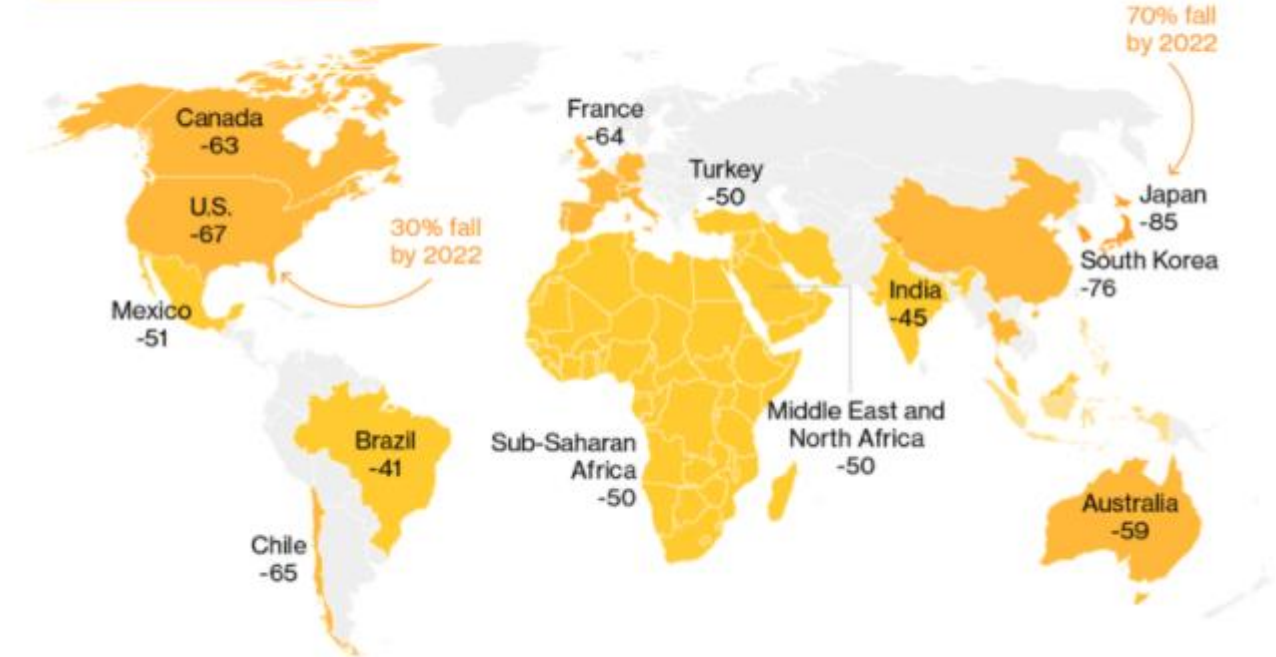
Solar Energy is Becoming More Affordable

The Cost of Solar Photovoltaic Panels Over Time



A Brighter Future

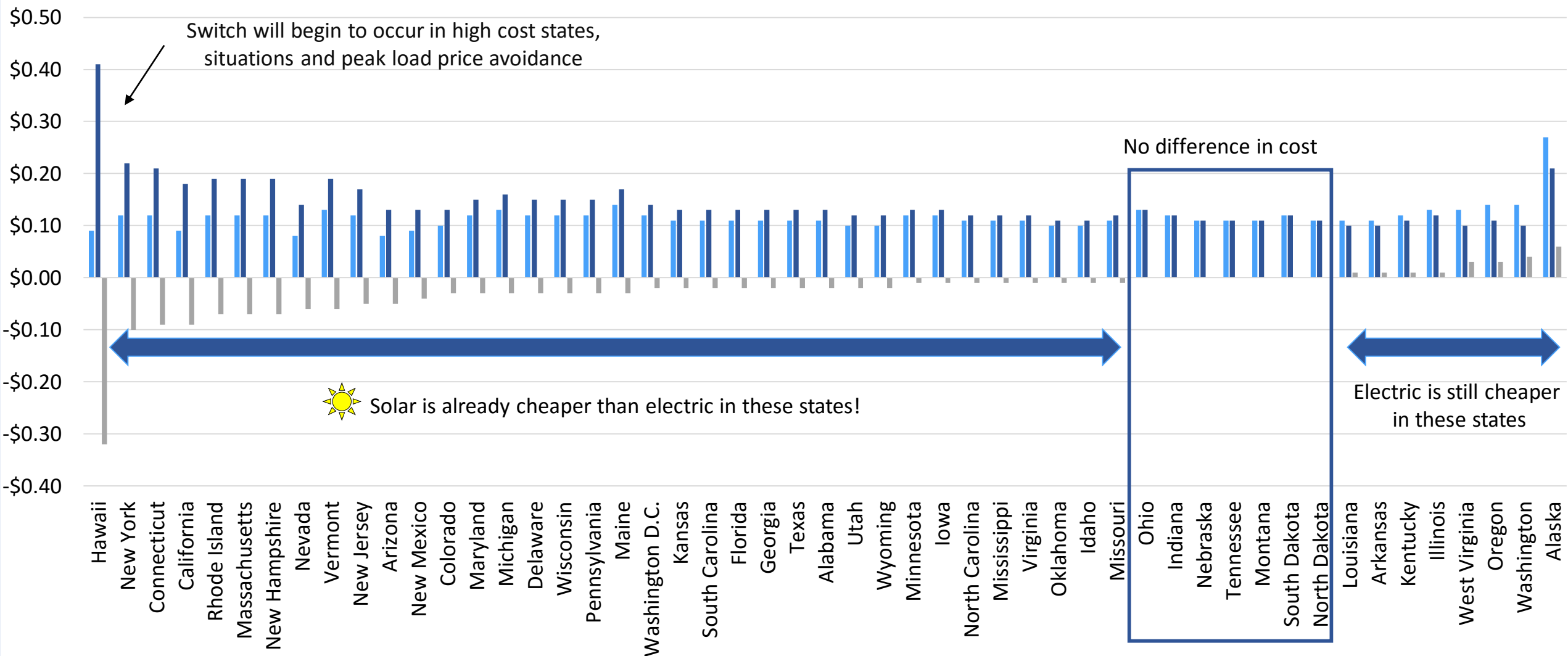
Solar costs will sink 67% in U.S. and 85% in Japan by 2040



Change in large solar farm costs. Source: Bloomberg New Energy Finance



Solar is Already Cheaper than Electric in Most States



*Based on 2017 forecast figures from a 2015 report

■ Solar Cost (\$/KWh) ■ Electricity Cost (\$/KWh) ■ Difference

Source: Deutsche Bank

Tesla Solar Roof

- No longer need solar panels attached to roof
- Now your actual roof can turn sunlight into electricity with glass solar tiles developed by Tesla
- Integrates with Tesla Powerwall home battery
 - Provides backup power during utility outages and natural disasters
 - Energy collected during the day is stored and made available any time

Switch will first come in business, later among consumers

Available Now



Available Now



Coming in 2018



Coming in 2018



Copenhagen International School in Denmark

- Building is completely covered by solar tiles
- Provides 300 MWh of electricity per year, accounting for 50% of the school's energy needs

Disintermediation Starts at Highest Cost

- Islands
- Peak Load Pricing



Photo: EPFL

Tesla's Battery System

- 396 stacks of Tesla batteries installed in Southern California Edison's Mira Loma substation, with 20 MW of energy storage capacity
- System sucks up electricity from the grid during the day and feeds it back into the system at night
- Can power roughly 15,000 homes over 4 hours
- Estimated cost of roughly \$29 million and took just under 3 months to complete
- PG&E's Colusa Generating Station, a 660 MW natural-gas fired power plant, cost roughly \$450 million and took 2 years to complete!

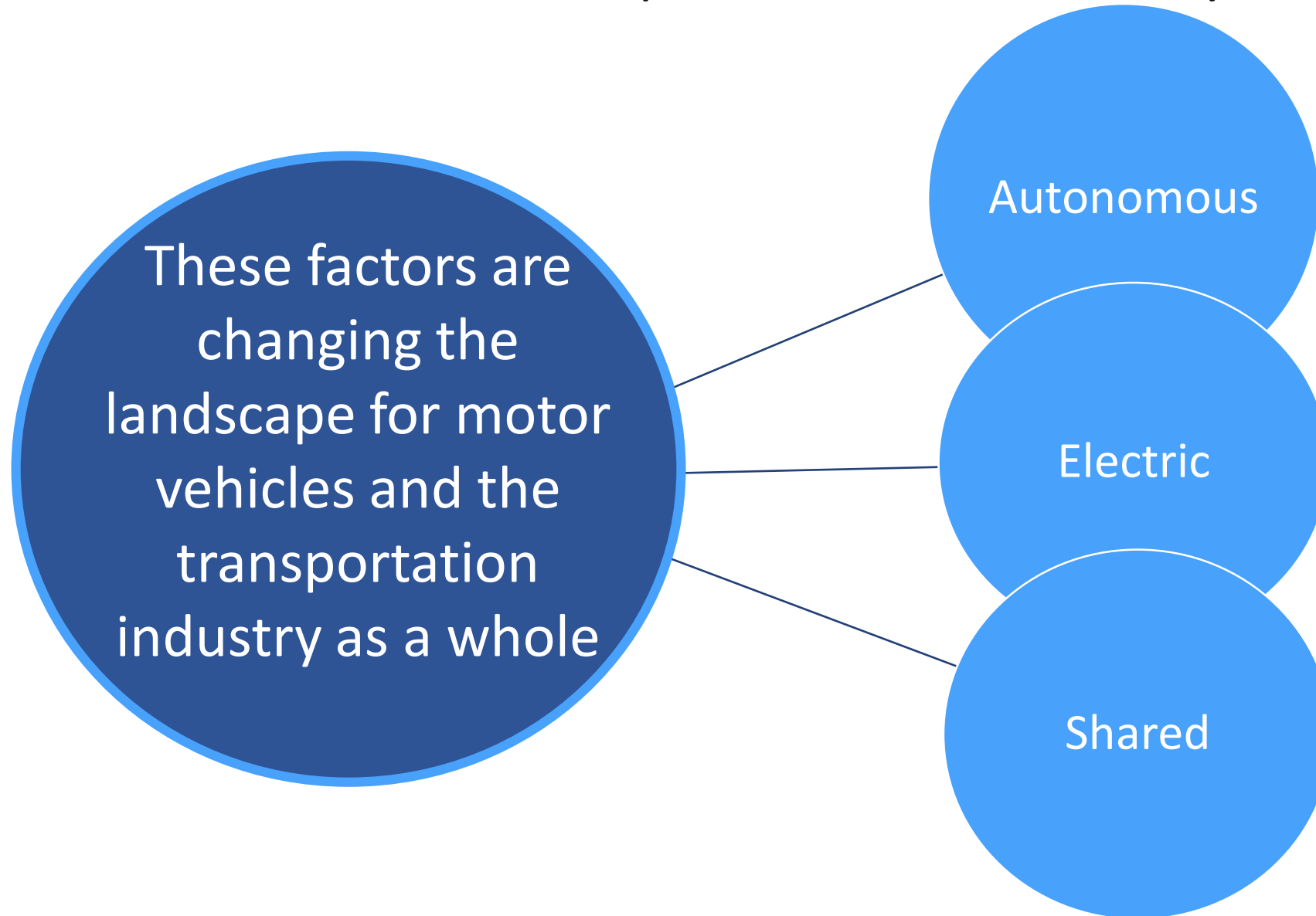


Tesla Powerwall

- Home batter (Lithium-Ion)
- Integrates with Tesla Solar
 - Stores surplus energy from solar panels for use at night and during utility outages
 - Uninterrupted service day and night
- Battery can draw electricity from the utility grid when rates are low and store it for later use
- Completely automated and requires no maintenance



The Consumer Transportation Industry is Changing

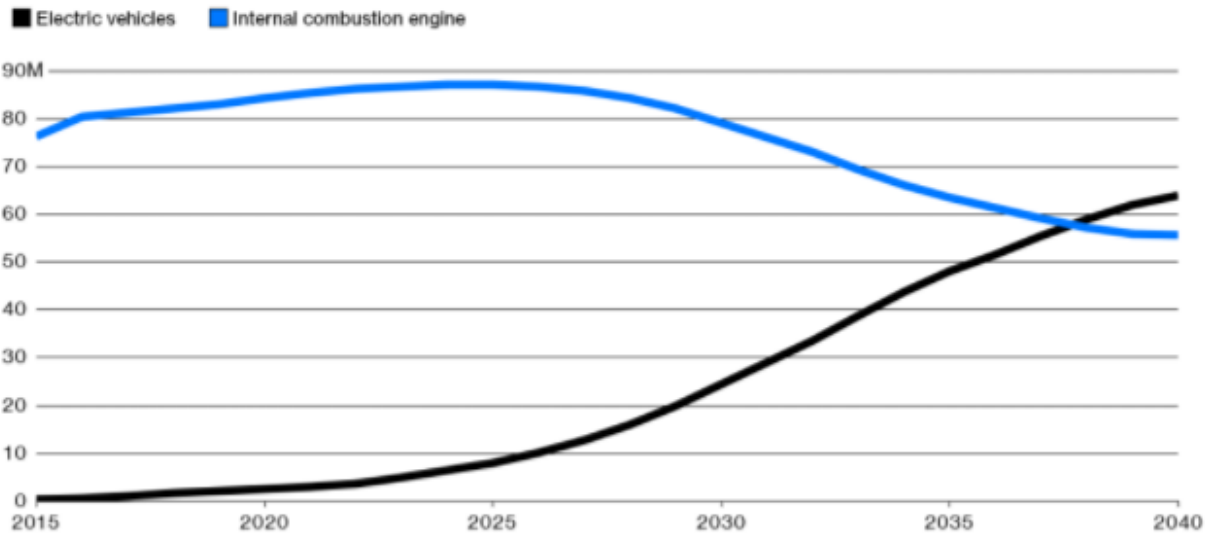


Electric Vehicles Will be the Standard in Coming Years

- As the cost of building cars and Lithium-Ion batteries fall, electric vehicles will outsell fossil-fuel powered vehicles sooner than we may think
- 18 moving parts vs. 2,000

Overtaking Lane

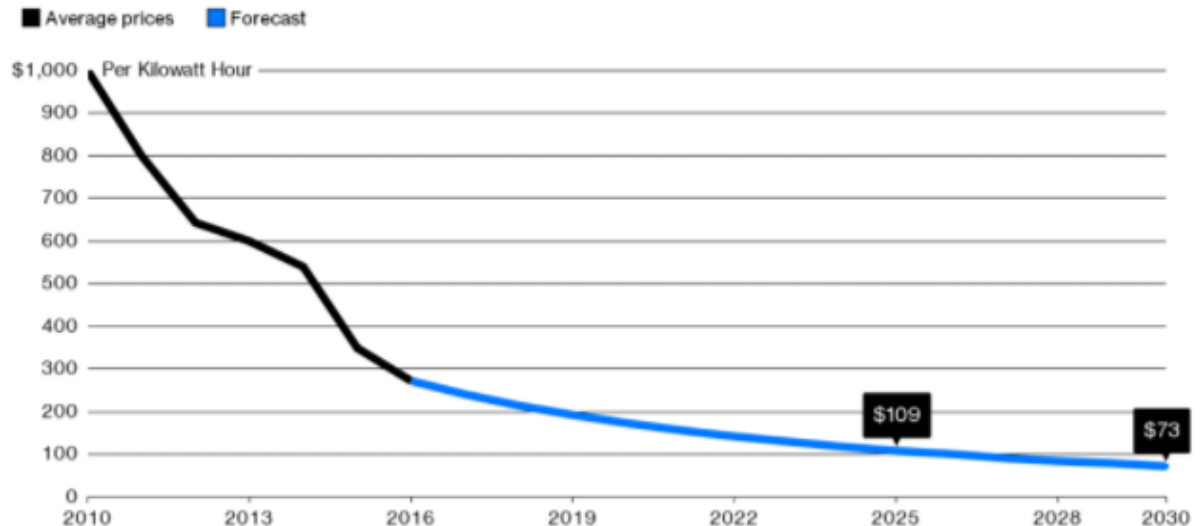
Electric vehicle sales will surpass internal combustion engine sales by 2038



Source: Bloomberg New Energy Finance

More Bang for Your Buck

Greater efficiency means a \$1,000 battery in 2010 will cost \$73 in 2030



Source: Bloomberg New Energy Finance

Autonomous Vehicles

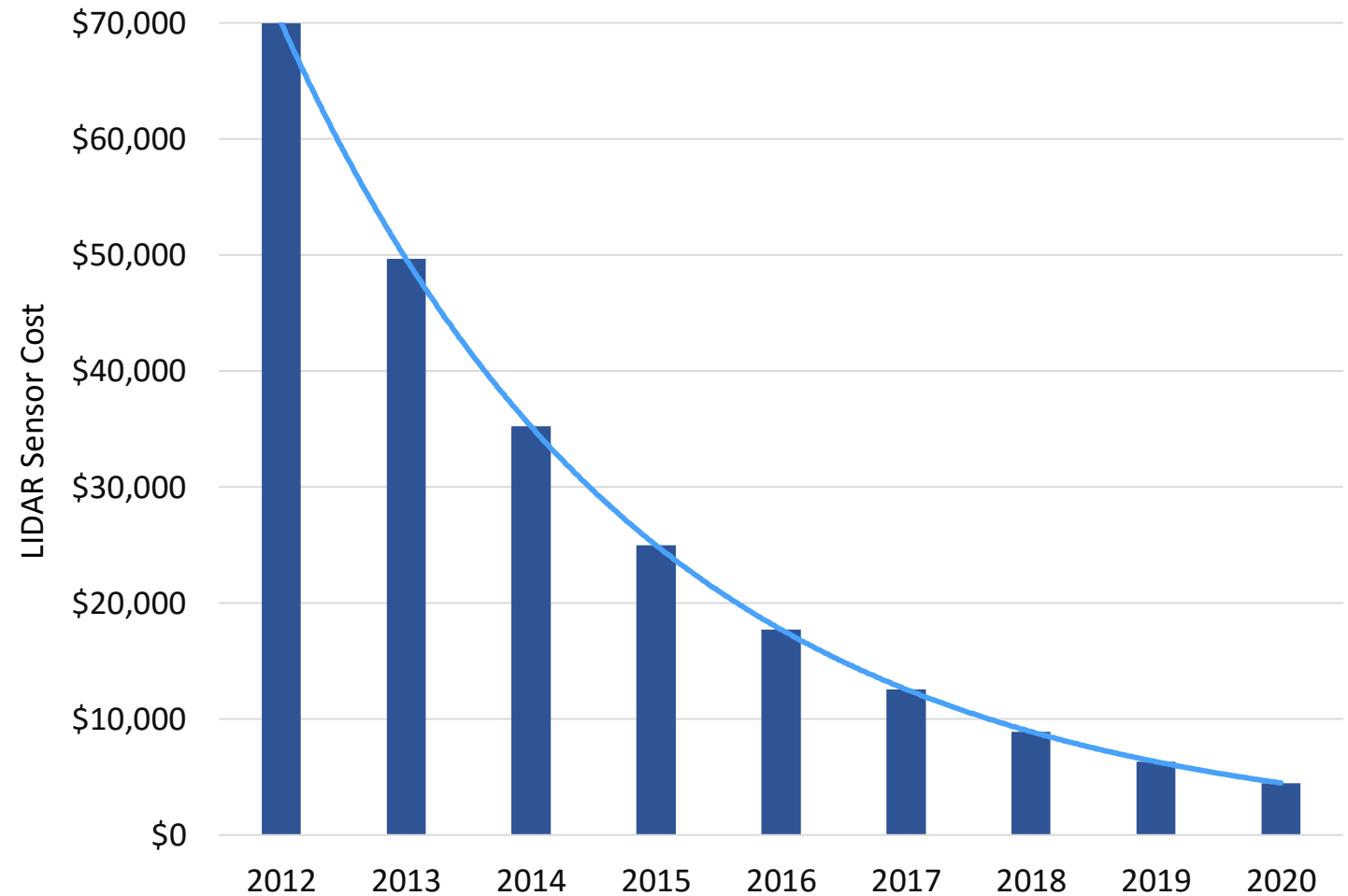
- Google's self-driving car project, now 'Waymo', has 3 million miles self-driven
- Nissan, BMW, and Mercedes have pledged to have autonomous vehicles ready by 2020
- Tony Seba: autonomous vehicles will save lives, save time, save space, save energy, and save money

LIDAR (laser + radar): allows car to "see" in 360 degrees



LIDAR Sensors Are Becoming More Affordable

LIDAR sensors are the most expensive component of autonomous vehicles, but the cost is rapidly decreasing



The Growth of Ridesharing Services

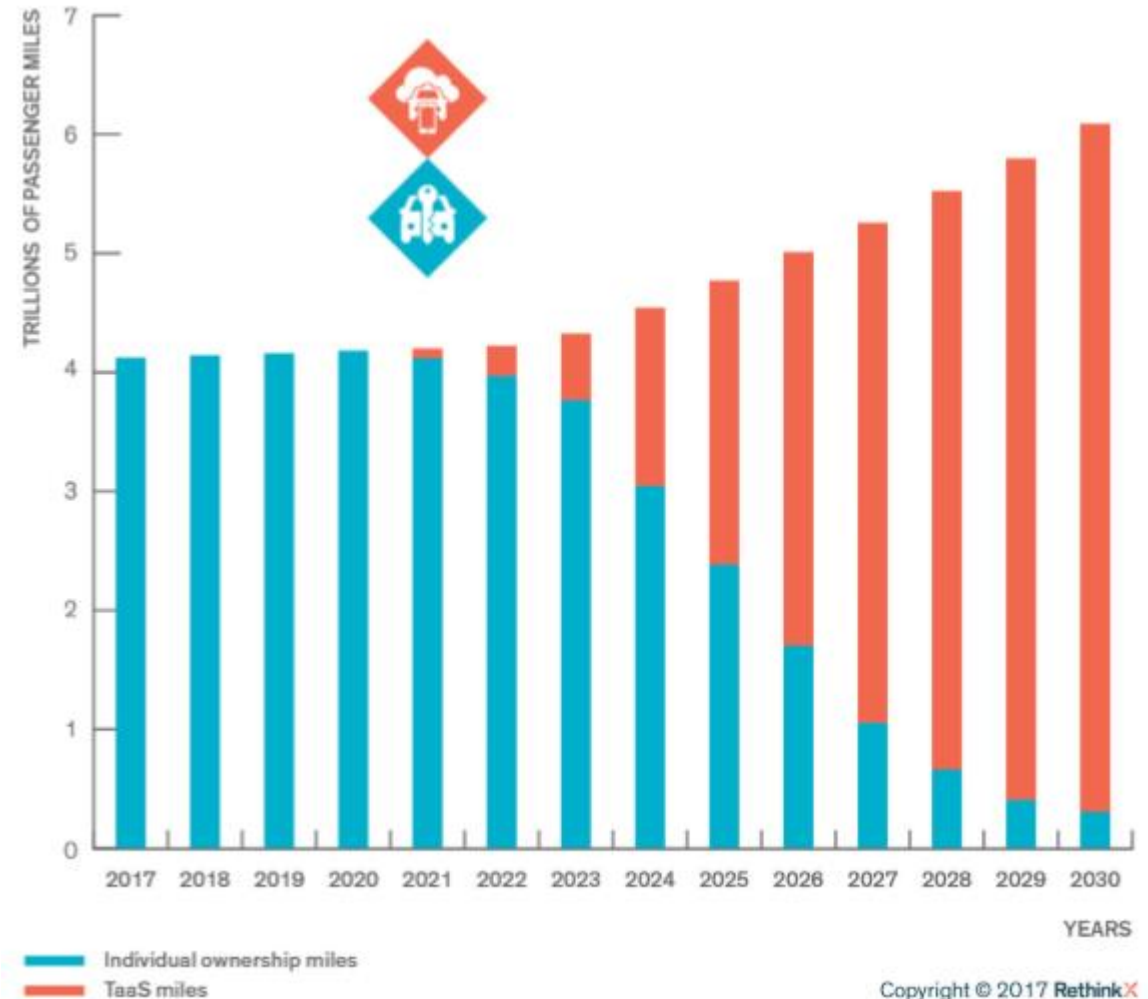
UBER

- Started in 2010
- Completed 5 billion trips (May 2017)
- 6 continents, 76 countries, 450+ cities (May 2017)



- Started 2012
- Provides over one million rides per day (July 2017)
- 360 communities (July 2017)
- Drivers have earned \$250 million in tips (June 2017)


» Speed of TaaS adoption



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Adoption in Commercial Transportation

- Long haul trucking
- Short haul trucking
- Delivery
- Services
 - Garbage
 - Snow Removal
 - Buses



These changes will be adopted by commercial transportation much quicker than consumer transportation because it makes economic sense!

So What? Demographics and Technology

- New technologies will be more widespread within the next 10 years
- May not affect you in the next two years, but certainly will over the typical ten year investment period
- Start preparing for how these technological disruptors will impact you
 - **You may be back in the utility business**
 - **You may have more land than you think**
 - **Efficiency is the play over the next 2 years – disruption in the next 10 years**

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