



Yardi Matrix Fall Commercial Overview

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Today's Agenda

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



The Yardi Matrix View- Office Investment Strategy

We are initiating investment strategy coverage for the Office asset class- with a bifurcated strategy

- US Office strategy can be thought of in two broad categories- cash yield and asset preservation in the Int'l Gateway Core Cities, and repositioning/re-invention of environments in Gateway Cities' Urbanizing Suburban Nodes & Non-Gateway Top 30 Cities and their Intellectual Capital Nodes
- US macroeconomic conditions, while not great, are solid and generating job growth of ~175-200K jobs per month
 - Enough to maintain decent office using employment growth, occupancy and slow rental growth
 - Secular changes in sq. ft. per person, co-working, and on-demand space are dampening influences on space needs
- US Office Supply growth is fairly concentrated in Gateway or Rapidly Growing Metro Areas
 - Supply surges in SF, Bay Area, Manhattan, Los Angeles, Seattle are very heavily Tech Influenced
 - Re-invention of Suburban office parks and creation of integrated communities is underway as value added plays.
- Oil prices are range bound- \$40-\$50/bbl. with regional pain continuing- 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 is on balance 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

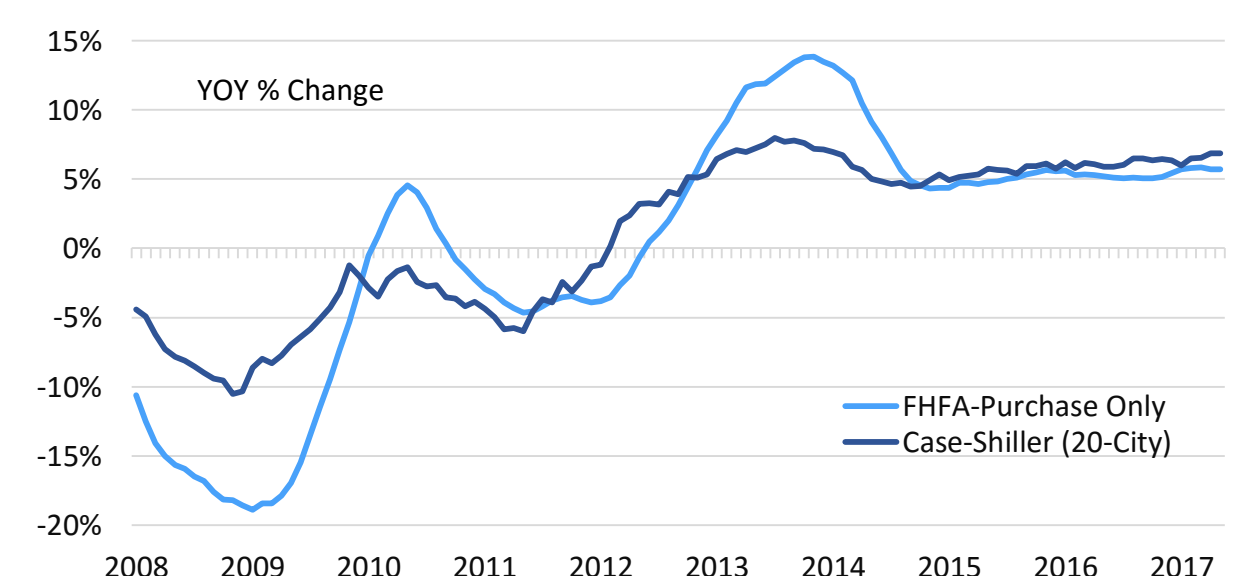
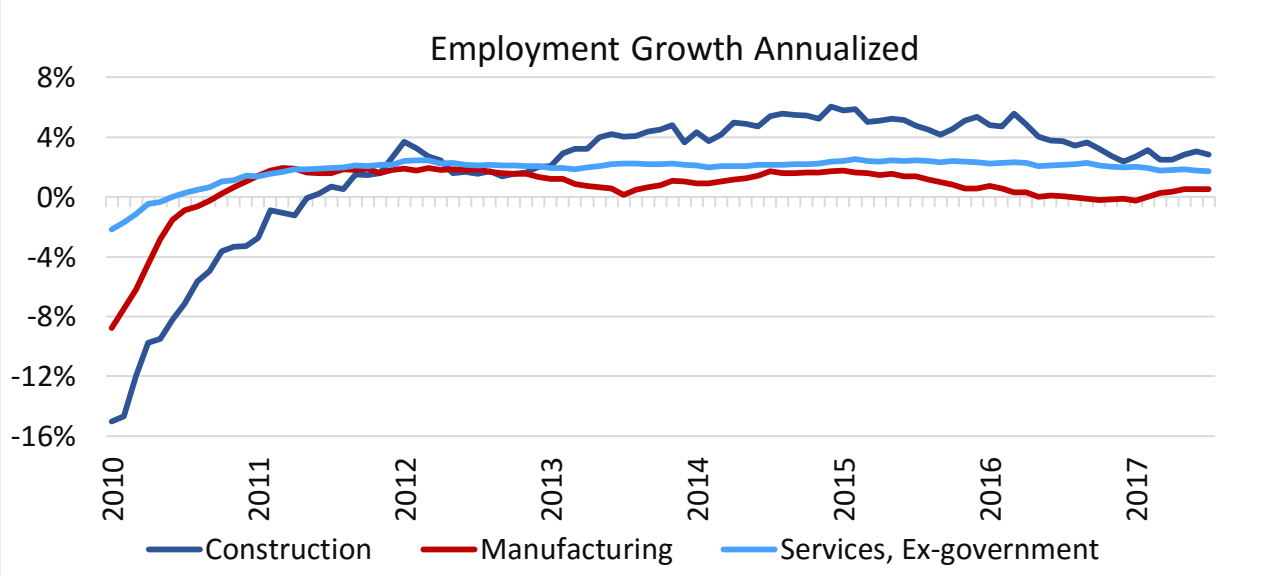
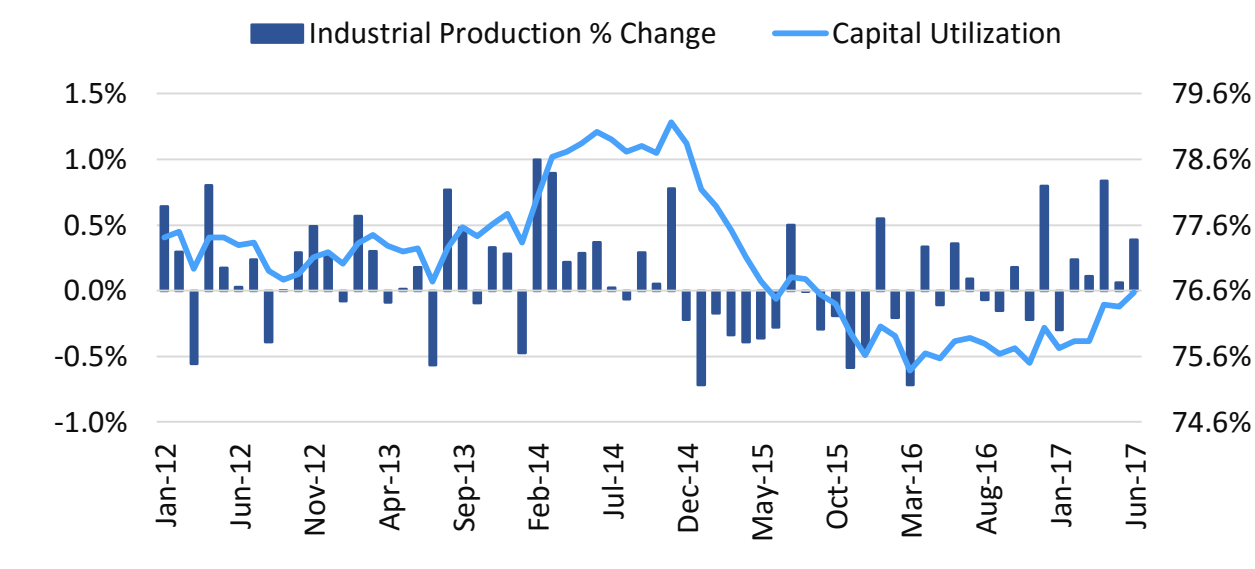
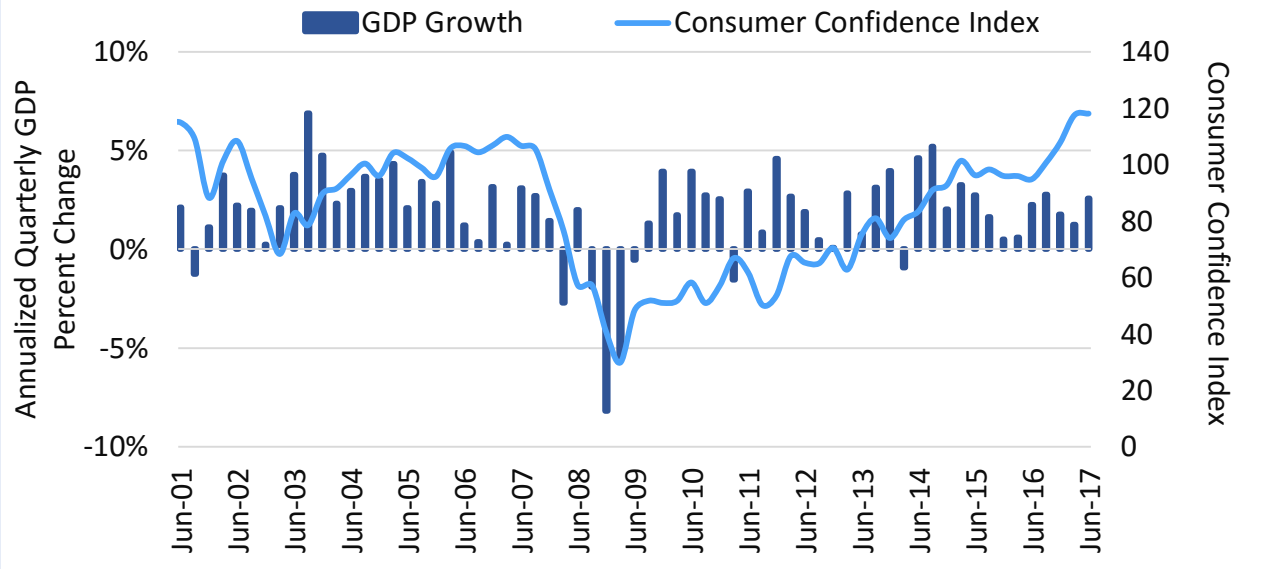
- US Macro Conditions
 - USA today mirrors tensions in 1930's- slow growth , deep divisions- regionally, socially, economically, politically
 - Recent Eurozone economic growth is encouraging; increased geopolitical risk of a miscalculation by rogue/non-state players
 - Getting US GDP growth from 2% up 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—impacting MF construction delays
- 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 Commercial Real Estate is still the place to be, but the ride is going to be bumpy

How Do Things Look Now?

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

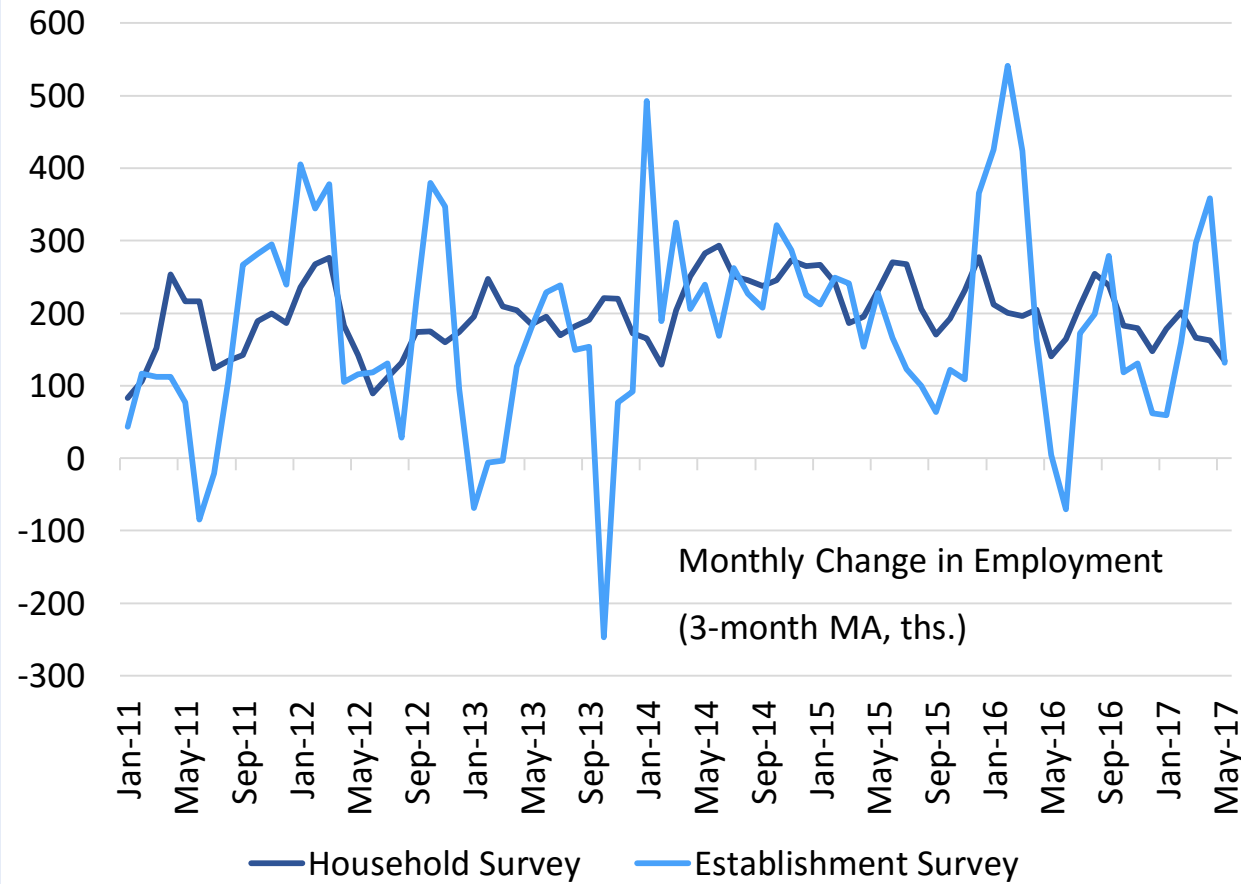
- US Office market conditions
 - Decent Vacancy (low teens) except for Manhattan (8%) and San Francisco (9%); Houston still reeling (21.5%)
 - Slow rent growth- ~1-2% ;
 - Structural components of demand are still positive
 - Wage pressures in the US are growing, leading to out-migration from Int'l Gateway Cities to Top "40" Tier
 - Supply Growth peaking in '17 at 90 MM sq. ft., declining to 50MM sq. ft. in '18
- Dislocation in Commercial 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 office growth up-cycle- after its delayed start from the Global Financial Crisis
 - Debt availability and cost is more tied than ever to global financial markets.
 - 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; it's a game of grinding out returns
 - 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

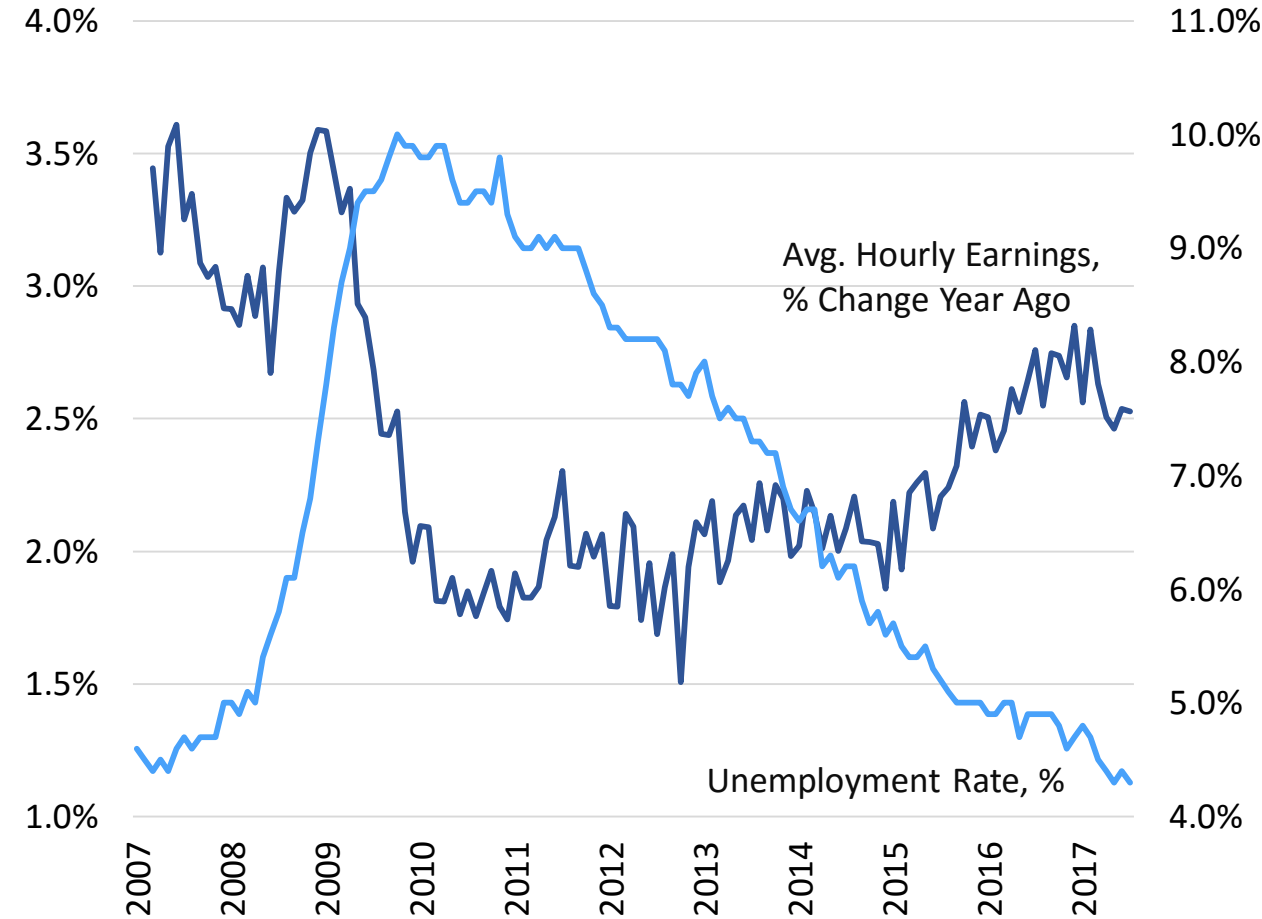


Job Growth and Wage Growth

Job formation good, but a tad more volatile



U.S. Wage Pressure Increasing



Earnings are Being Artificially Held Down

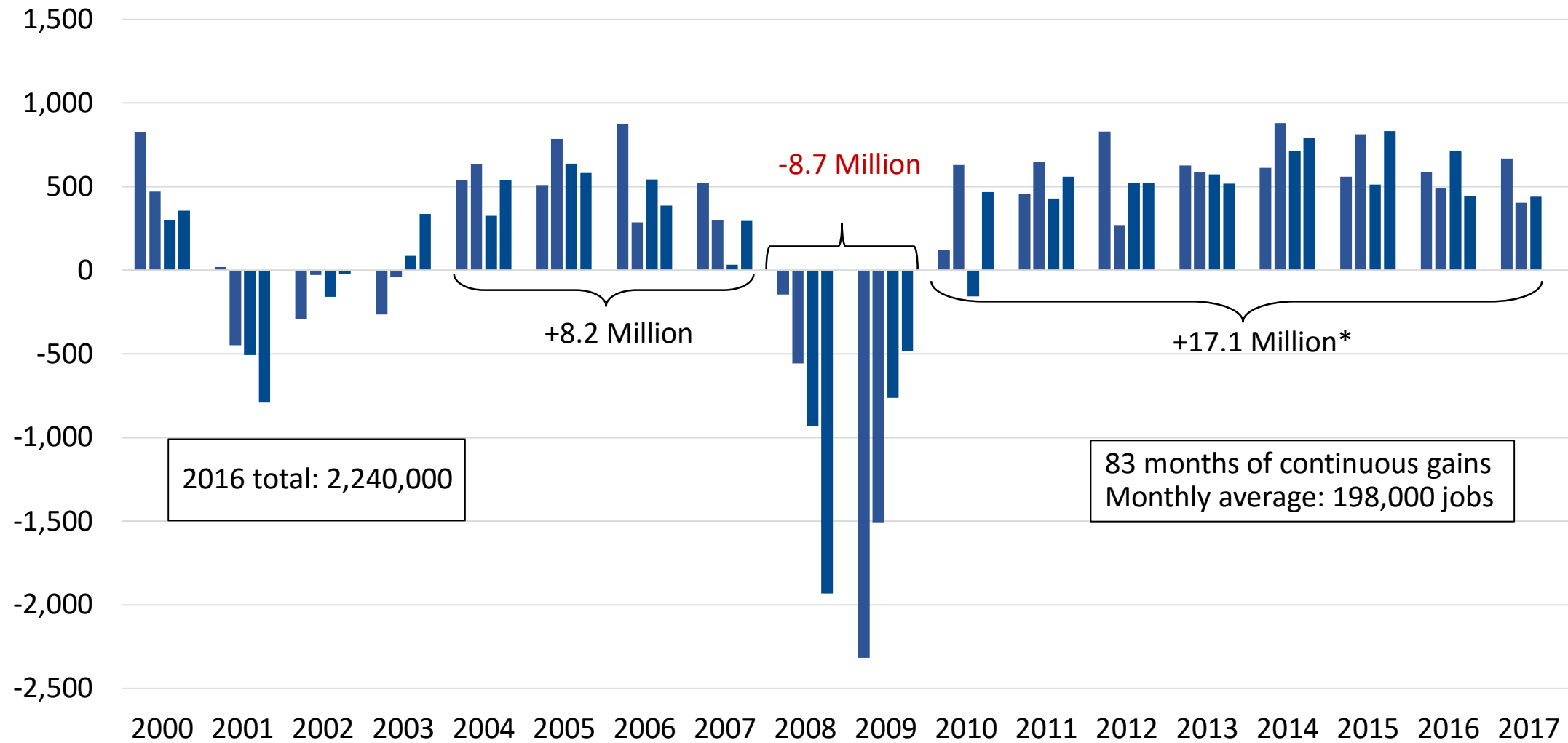
The Good News on Wage Growth

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%.*



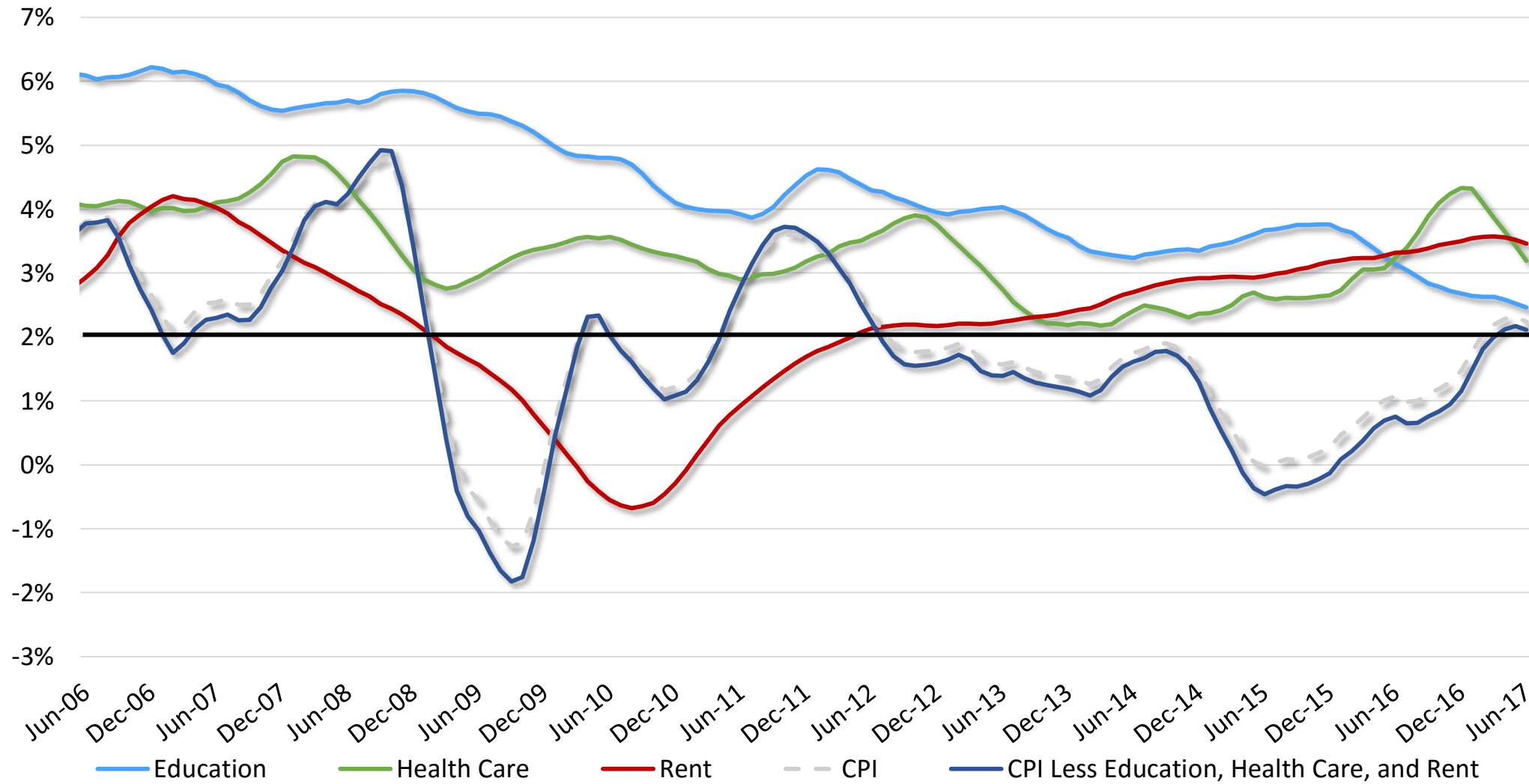
Quarterly Job Growth



*Through August 2017

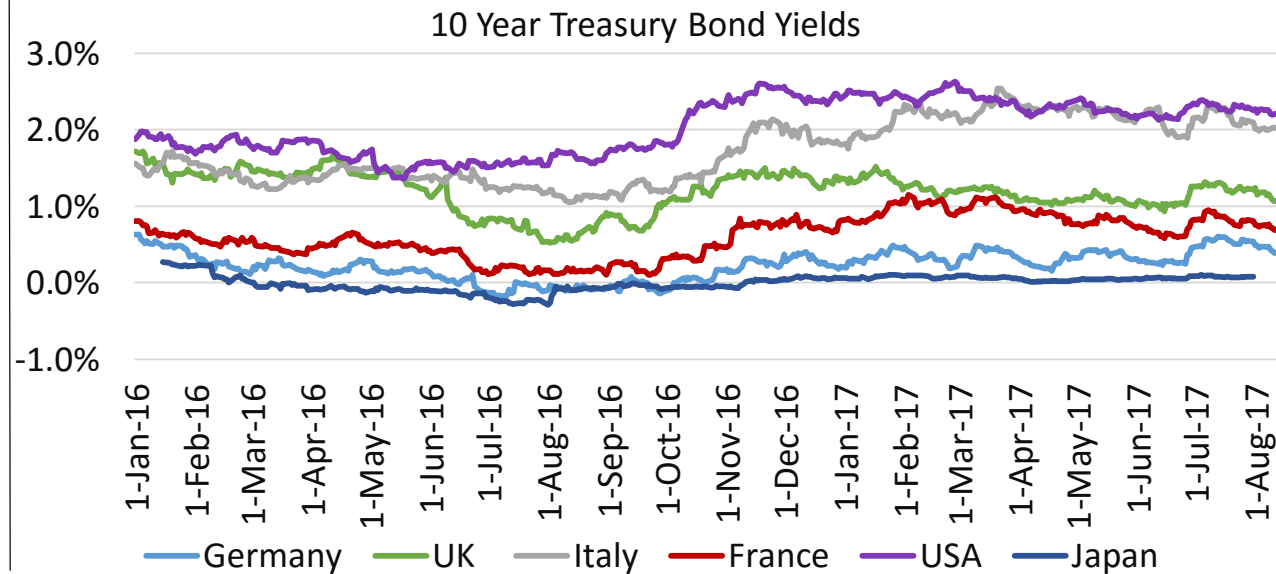
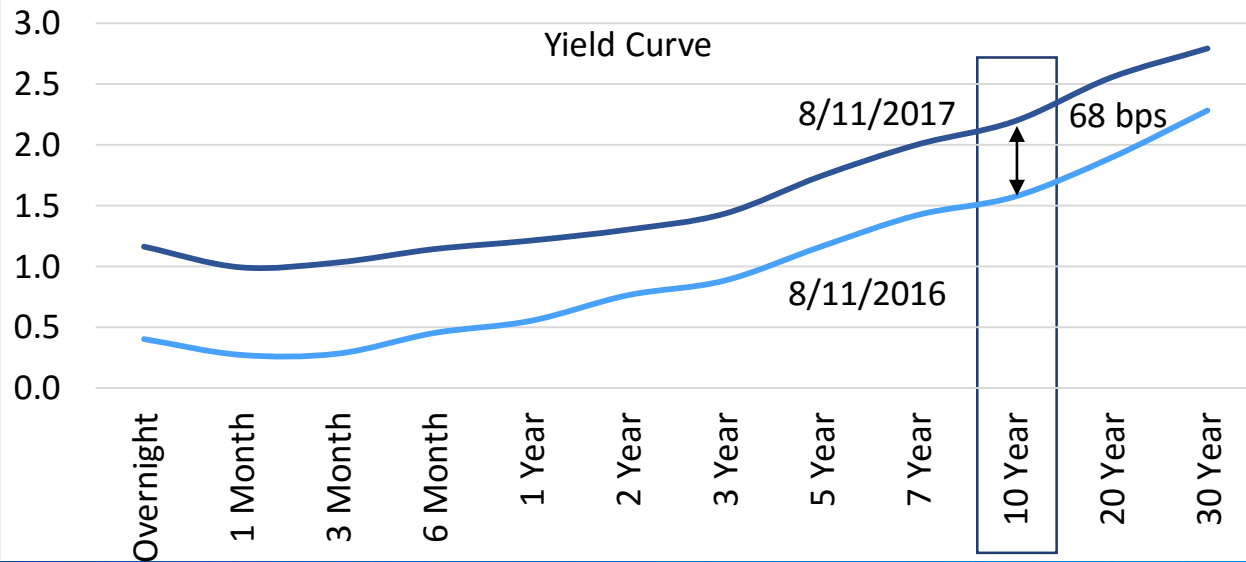
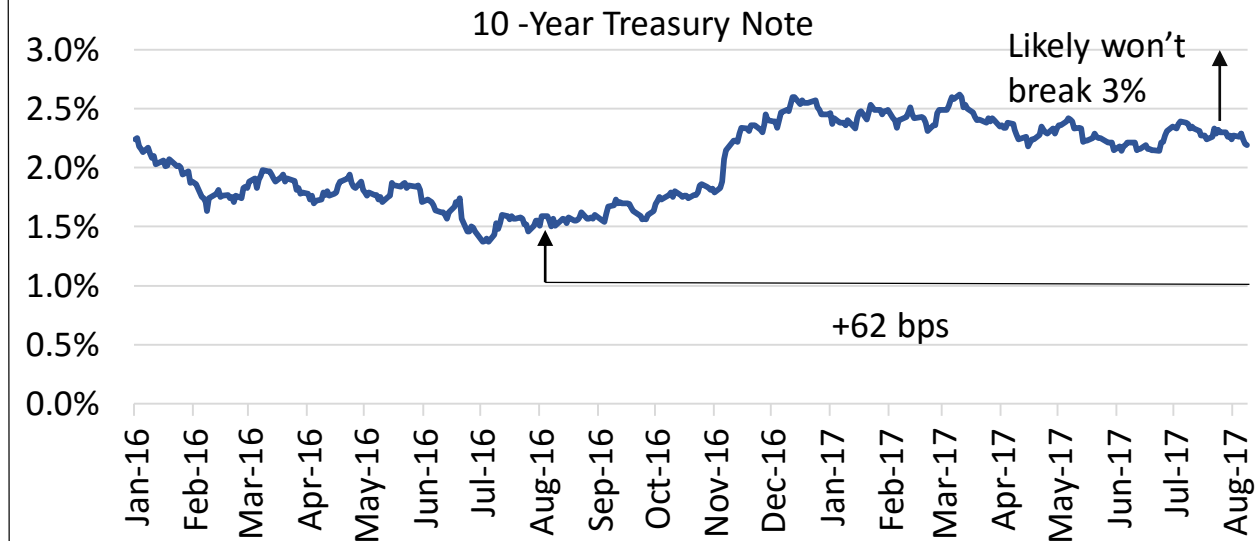
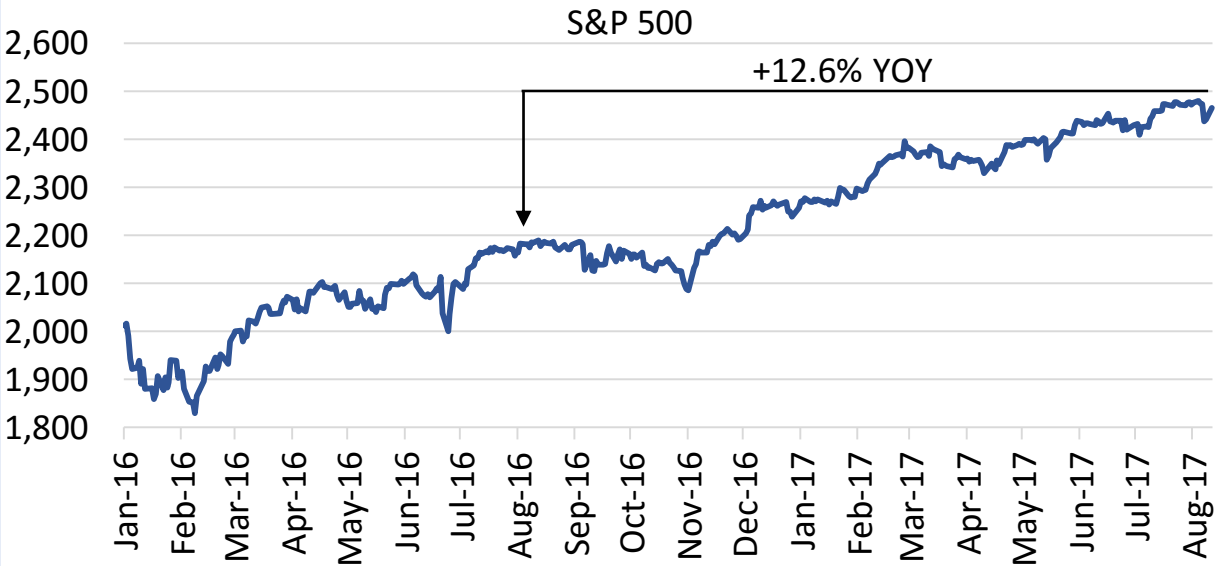
Source: Bureau of Labor Statistics (BLS)

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"

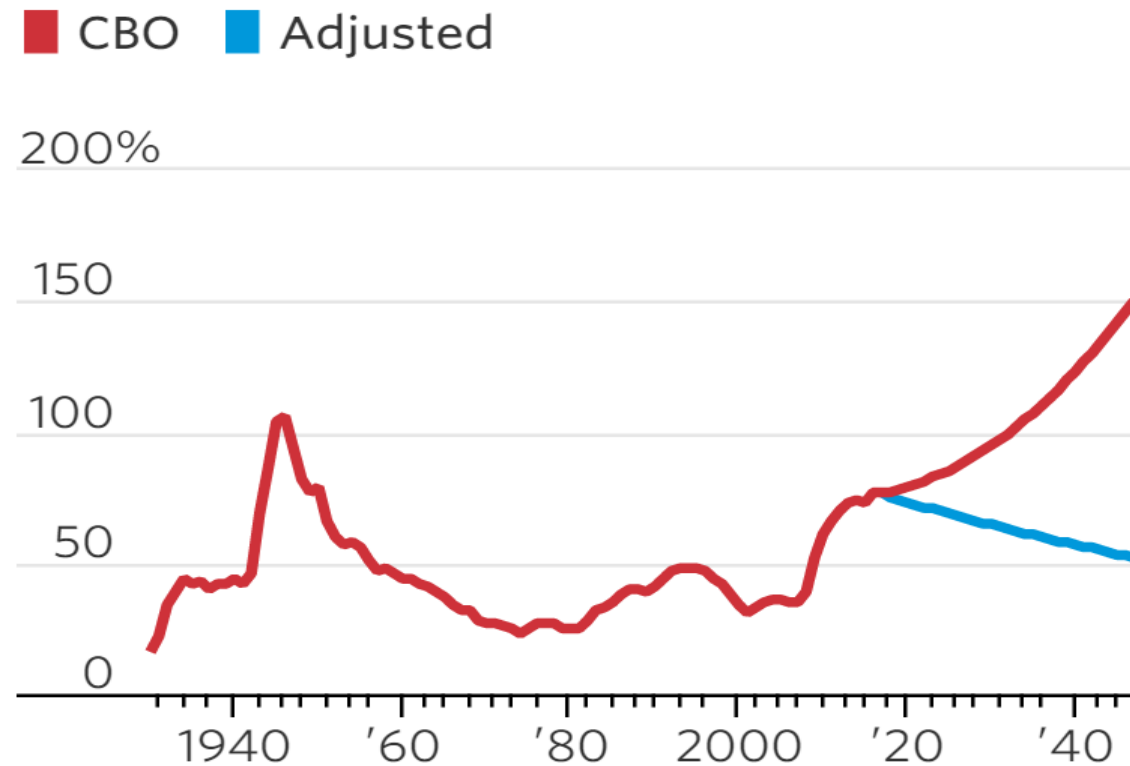
U.S. and International Financial Market



Source: Moody's Analytics; Investing.com

It's Not All Sunshine and Roses...

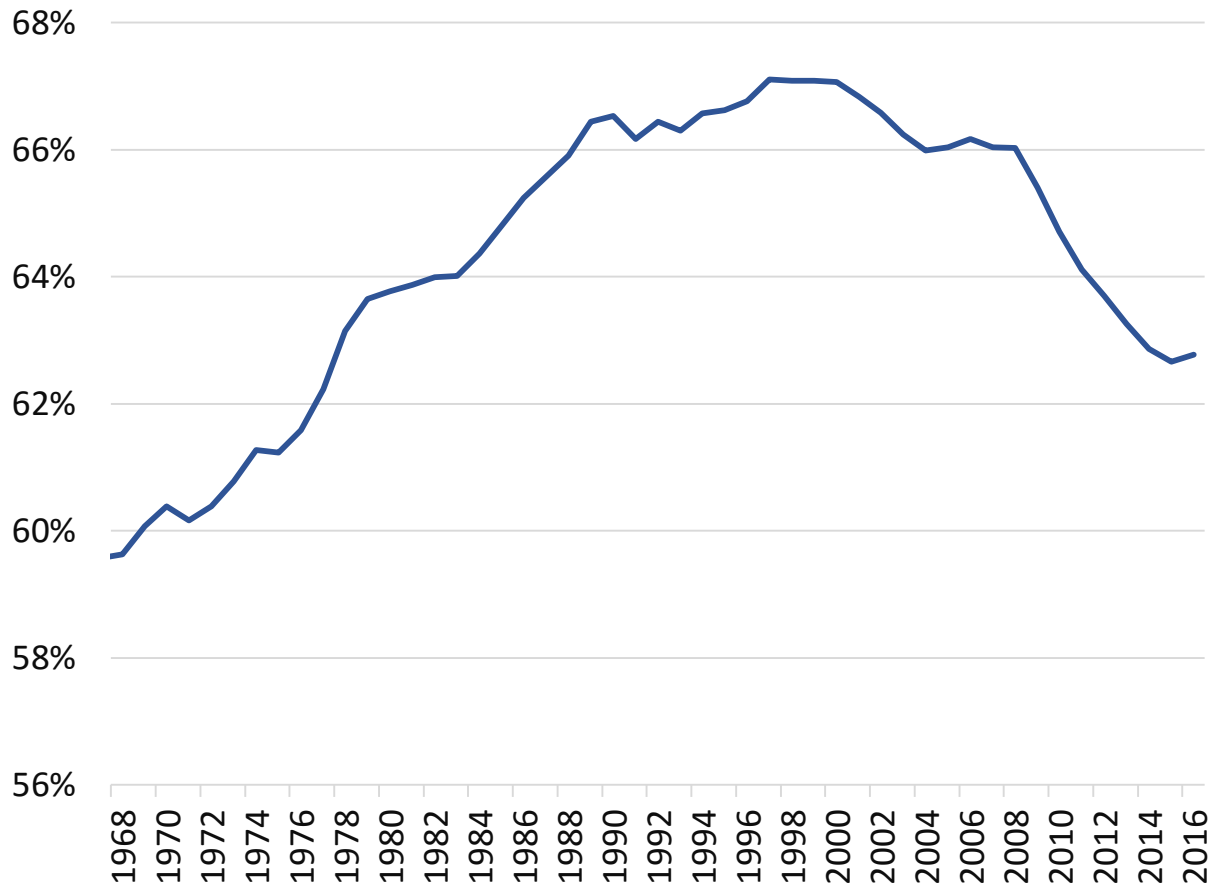
- Raising long-term GDP growth from 2% to 3% drives just about everything
 - US government debt, equity markets, corporate debt, etc.
 - That's what matters



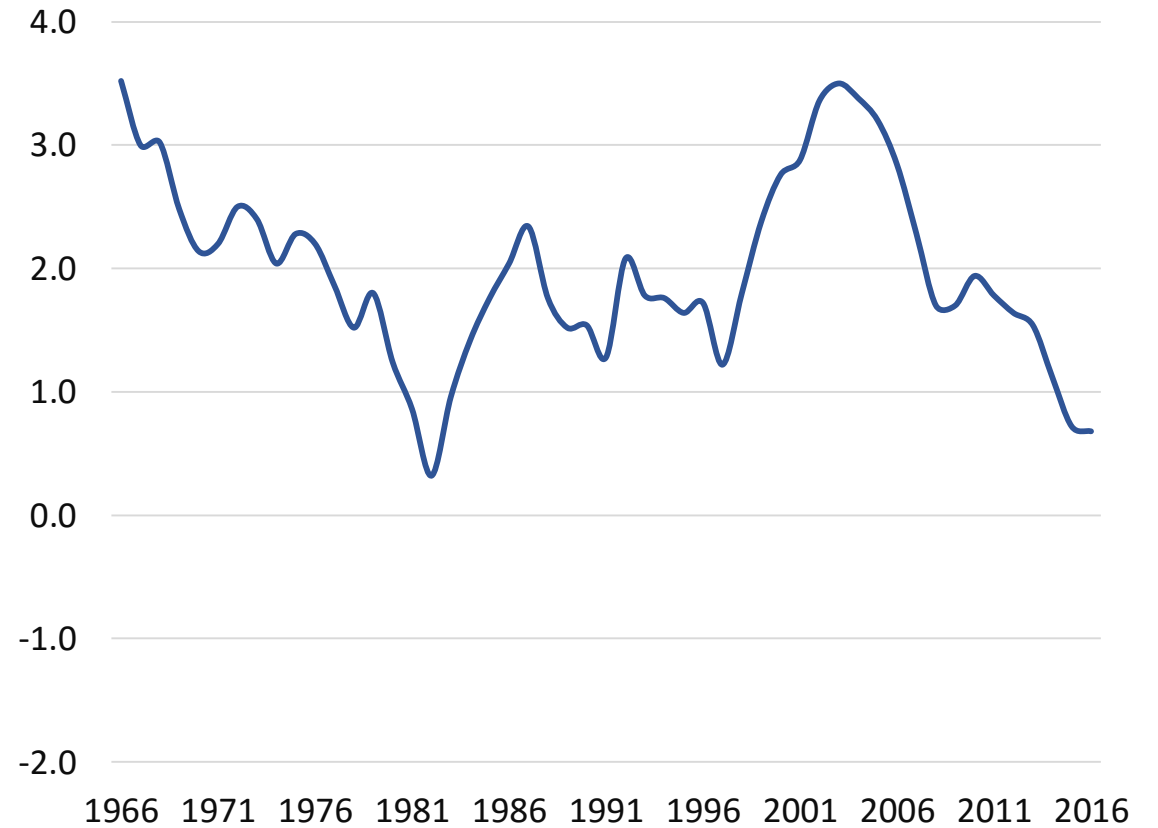
Getting U.S. GDP to Grow Means Swimming Upstream

Where will U.S. GDP growth come from?

Labor Force Participation Rate



Labor Productivity Annual Change Nonfarm Business Sector

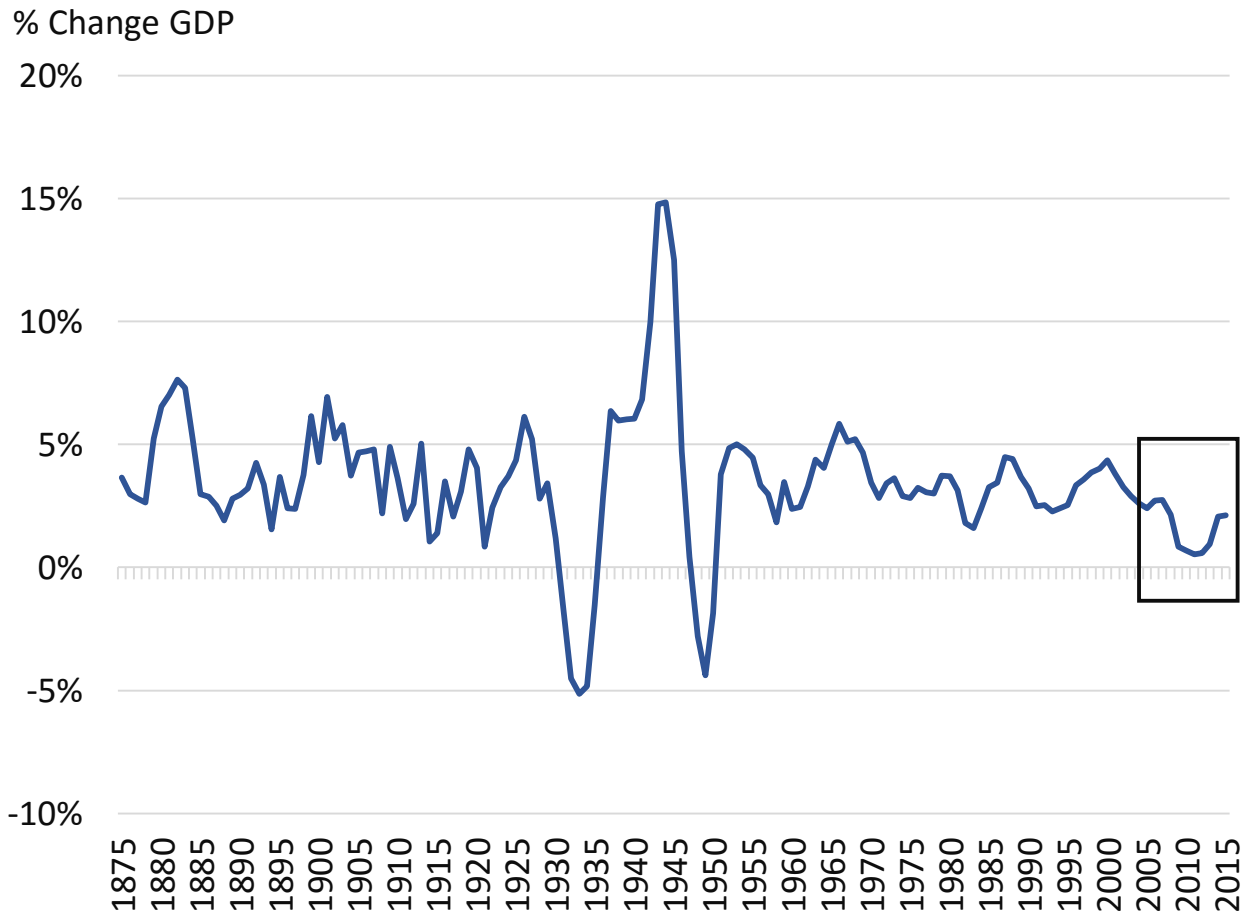


*Through December 2016

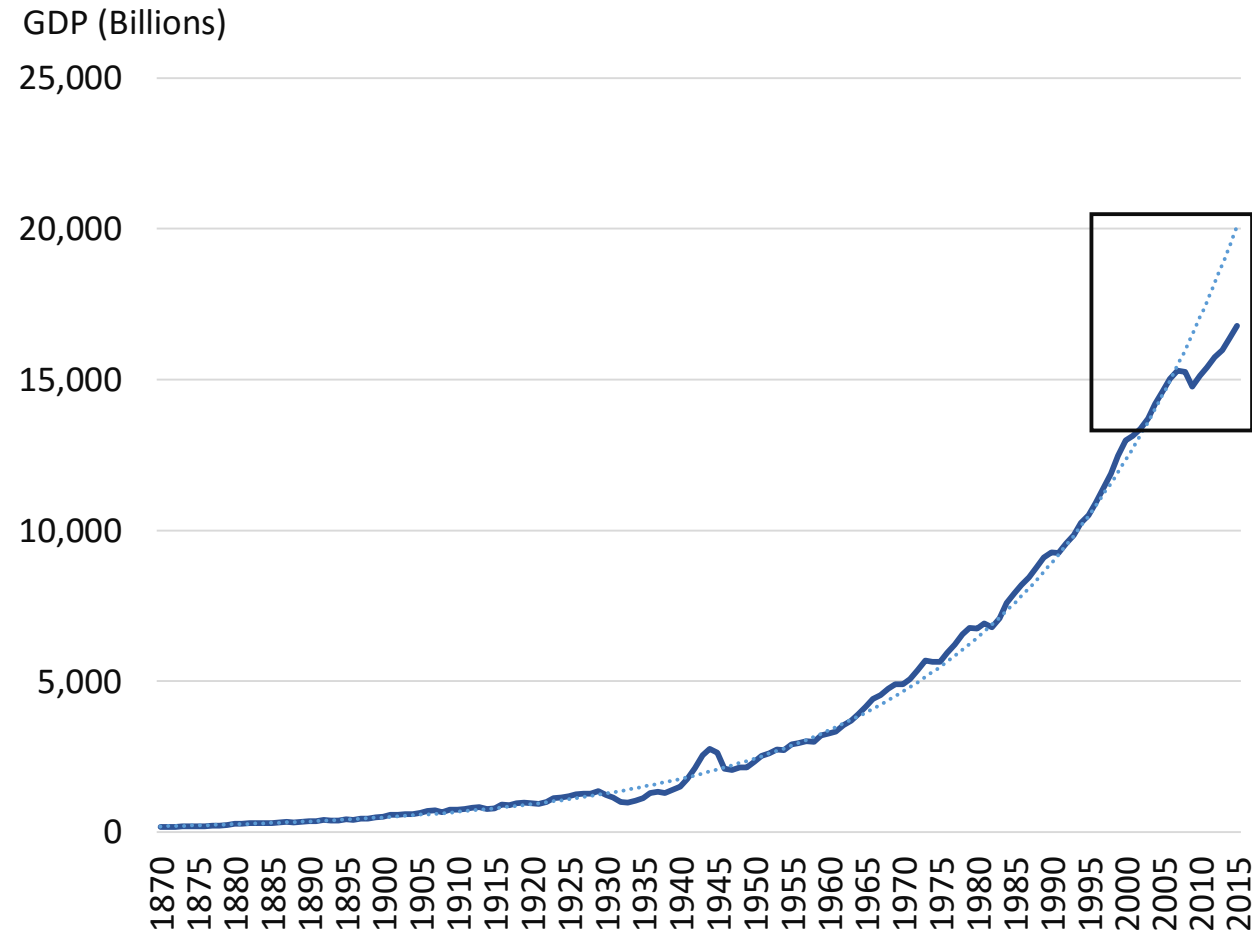
Source: Moody's Analytics; Bureau of Labor Statistics (BLS)

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:

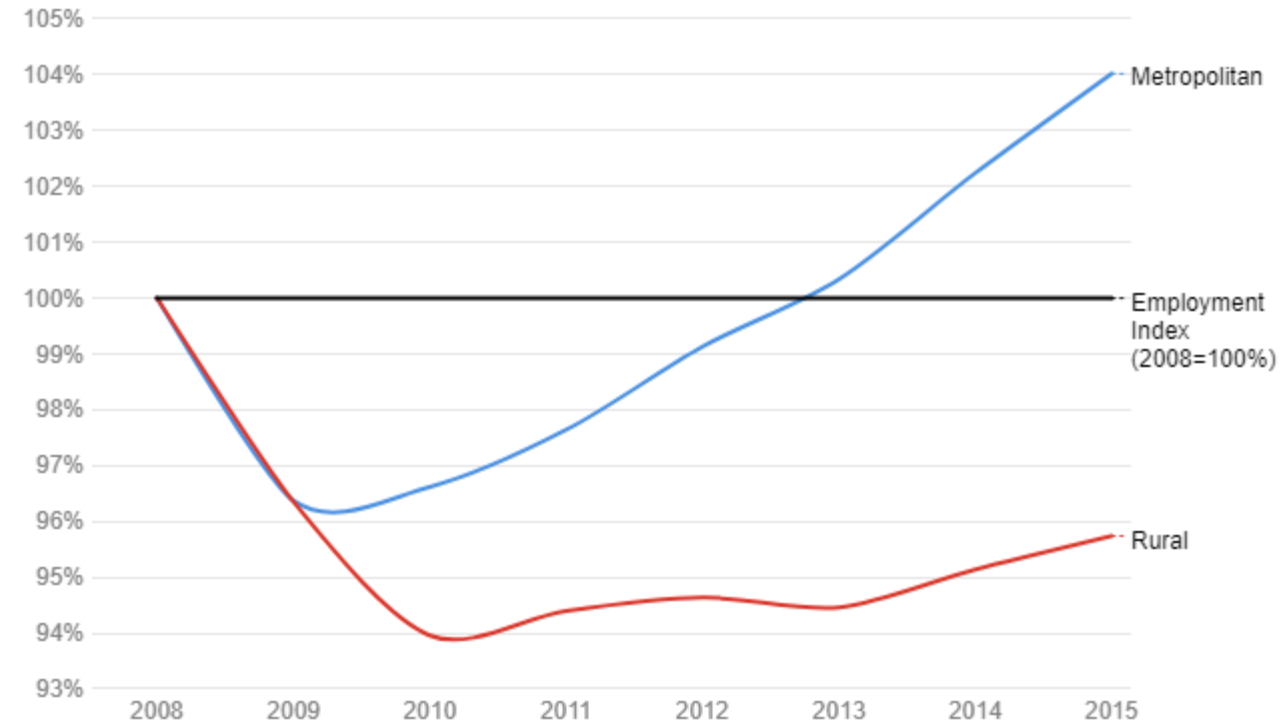
- Coming from the lower-end
- Pulling people off the sidelines

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

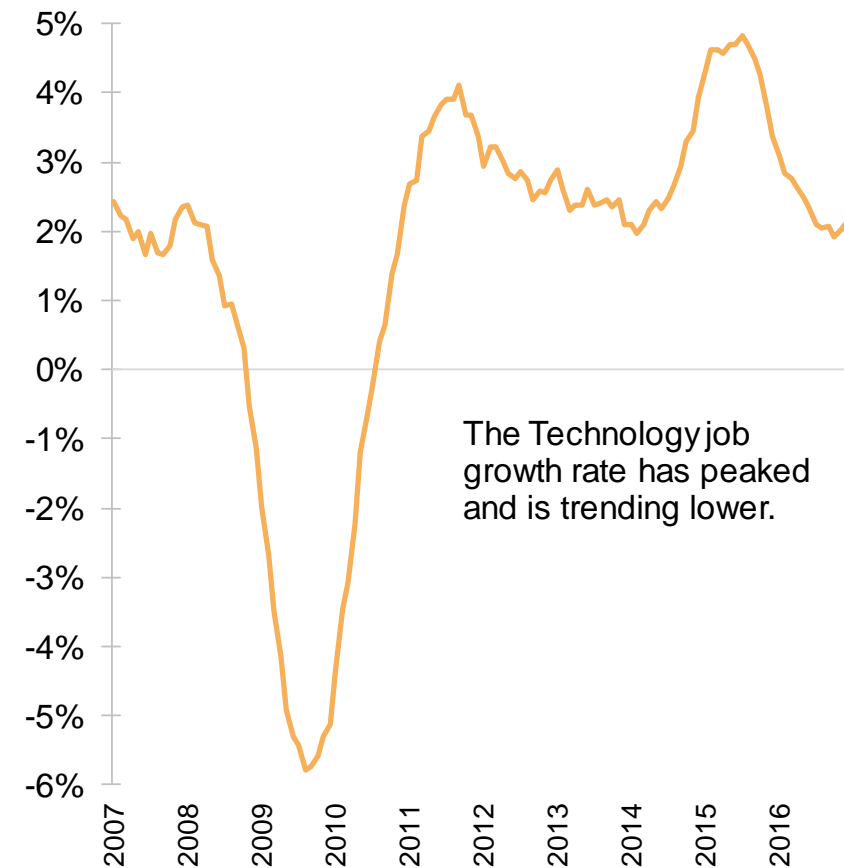
Employment up since bottoming in late 2009, but job growth is slowing

Technology Sector Employment



Technology Sector Employment

YOY growth



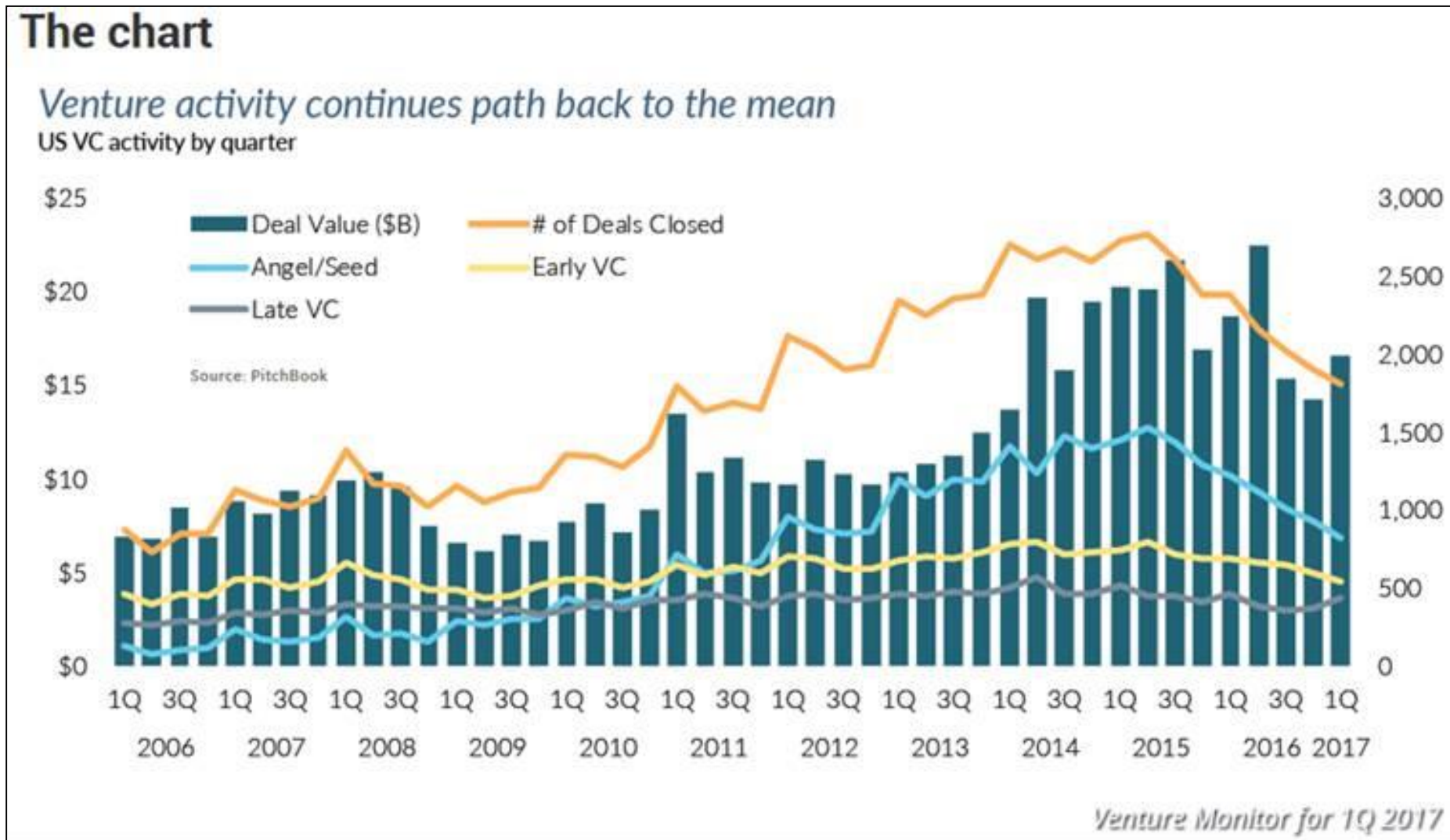
The Technology job growth rate has peaked and is trending lower.

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

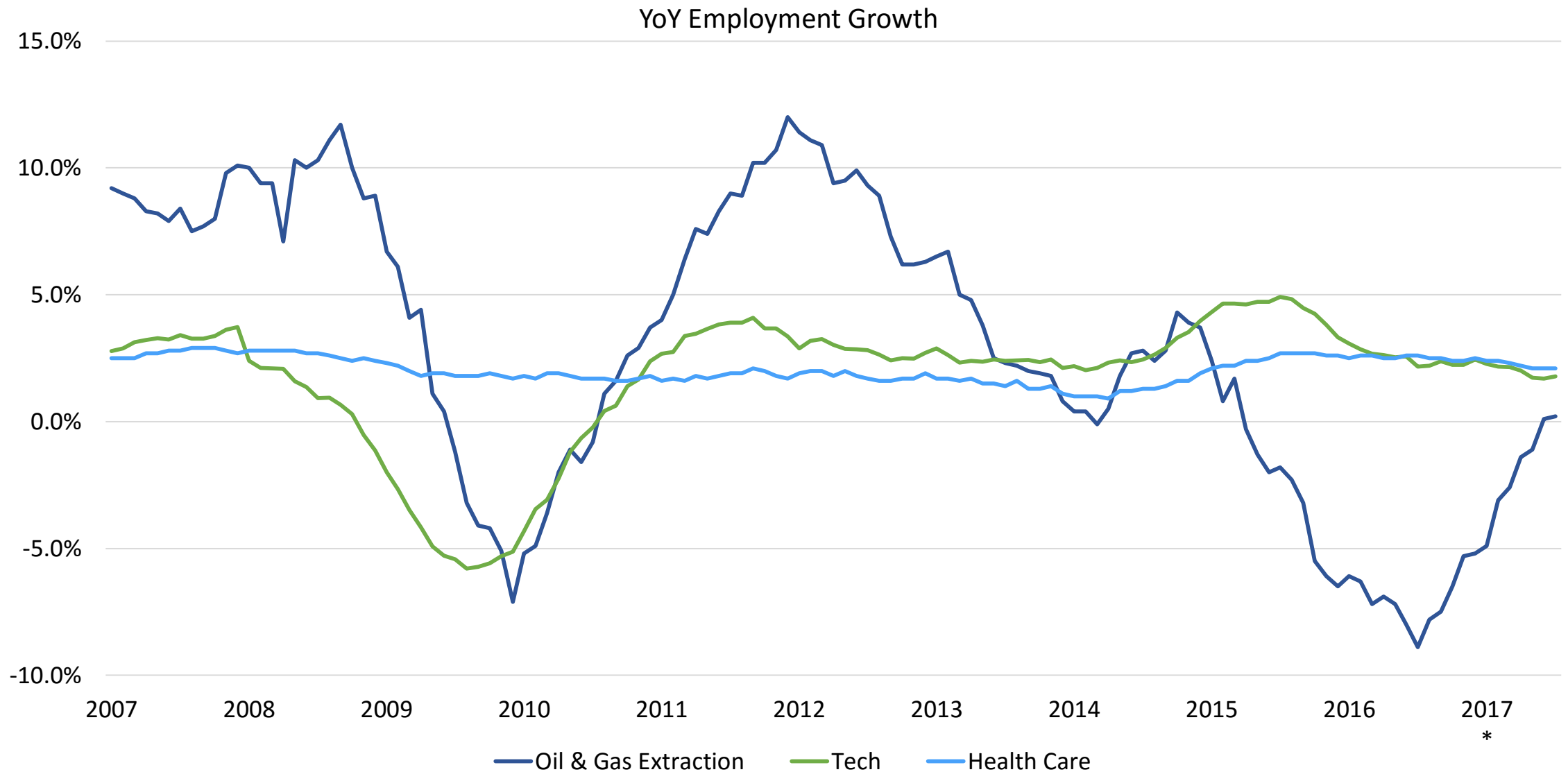
Computer and Electronic Products, Data Processing & Hosting, Computer Systems Design and Related Services

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

Venture Capital is a Precursor for the Tech Economy



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

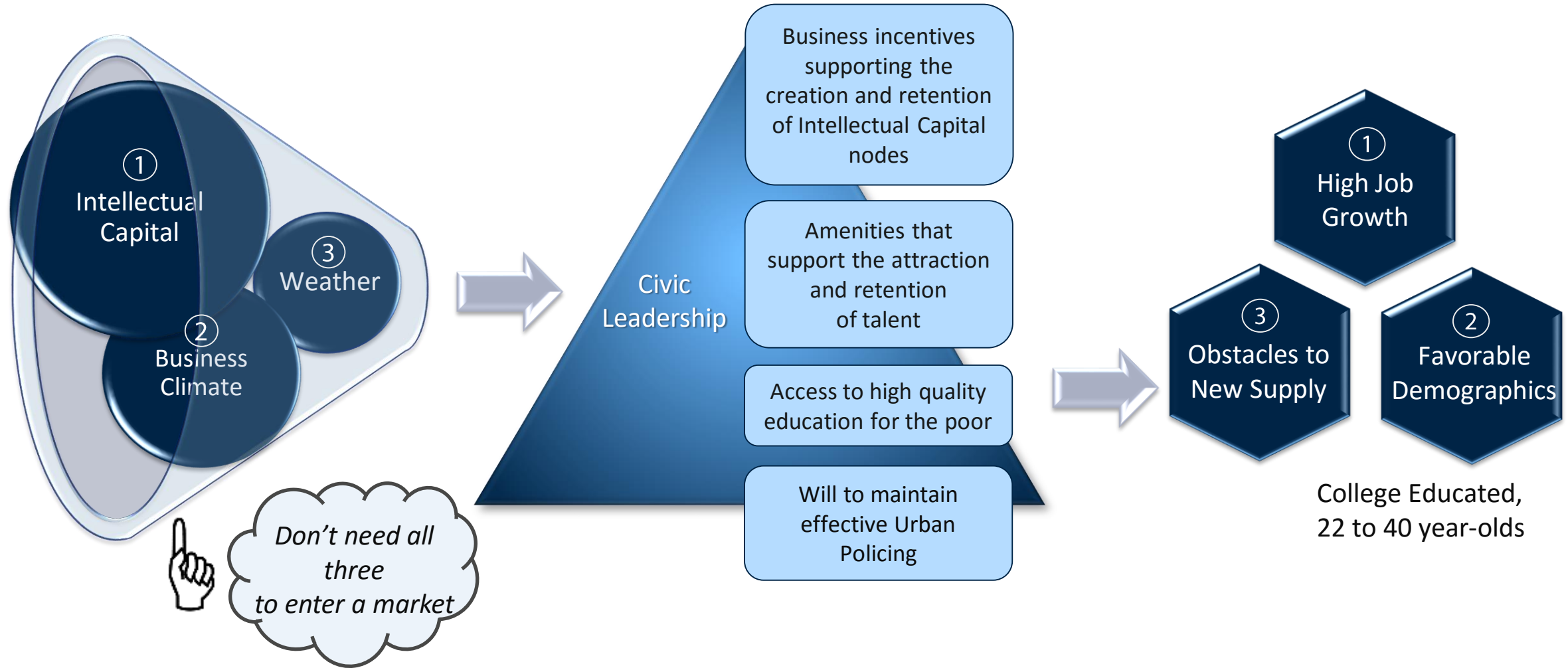


Noise but Some
Derivative Impacts

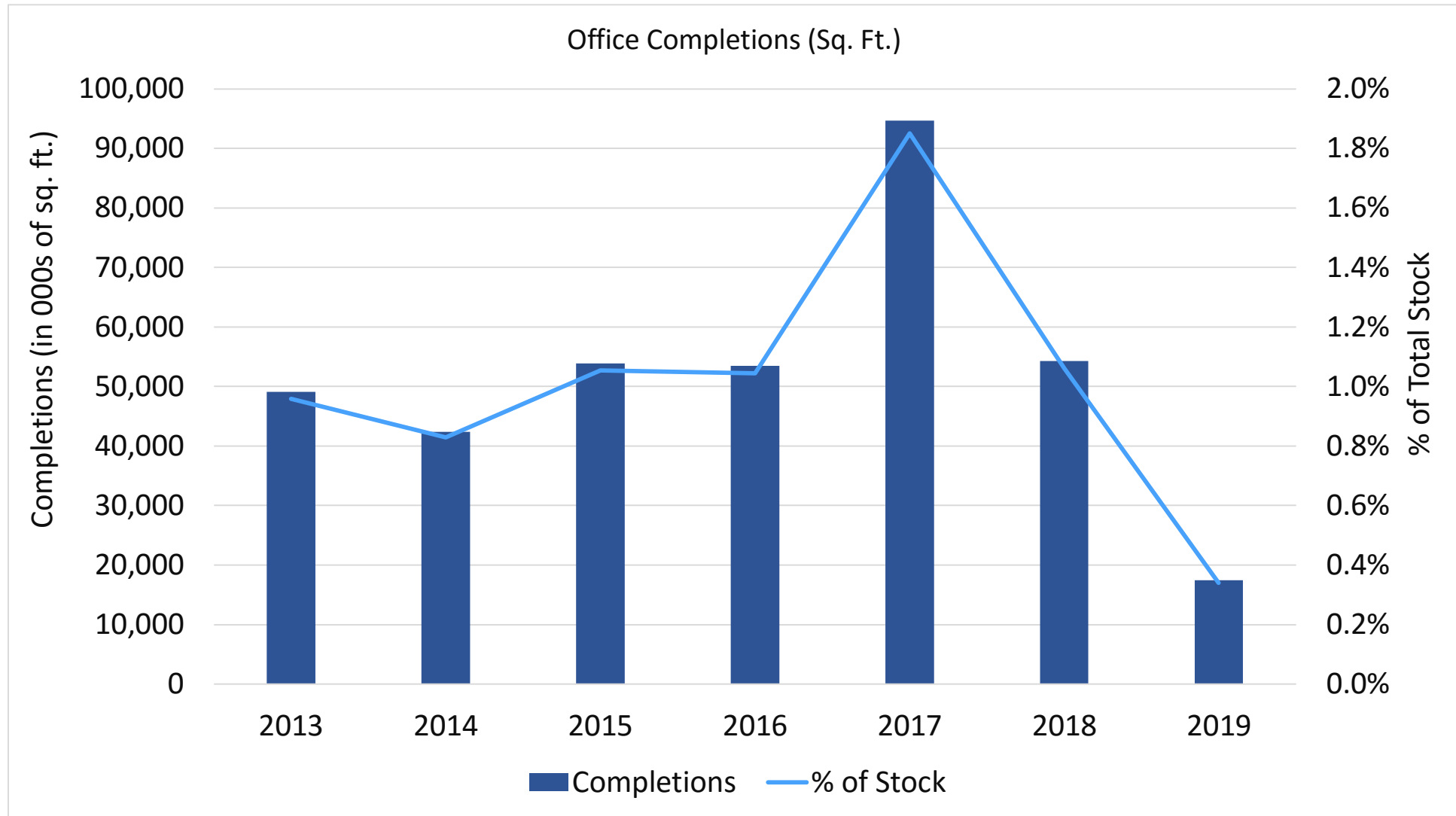
So What? Economy & Federal Policy

- 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
- Job formation, and wealth creation has been highly concentrated in urbanized metro areas
- Long term sector fundamentals still favor Tech—but broadly speaking--
- Positive public policies can extend the expansion

The Investment Decision-Making Process

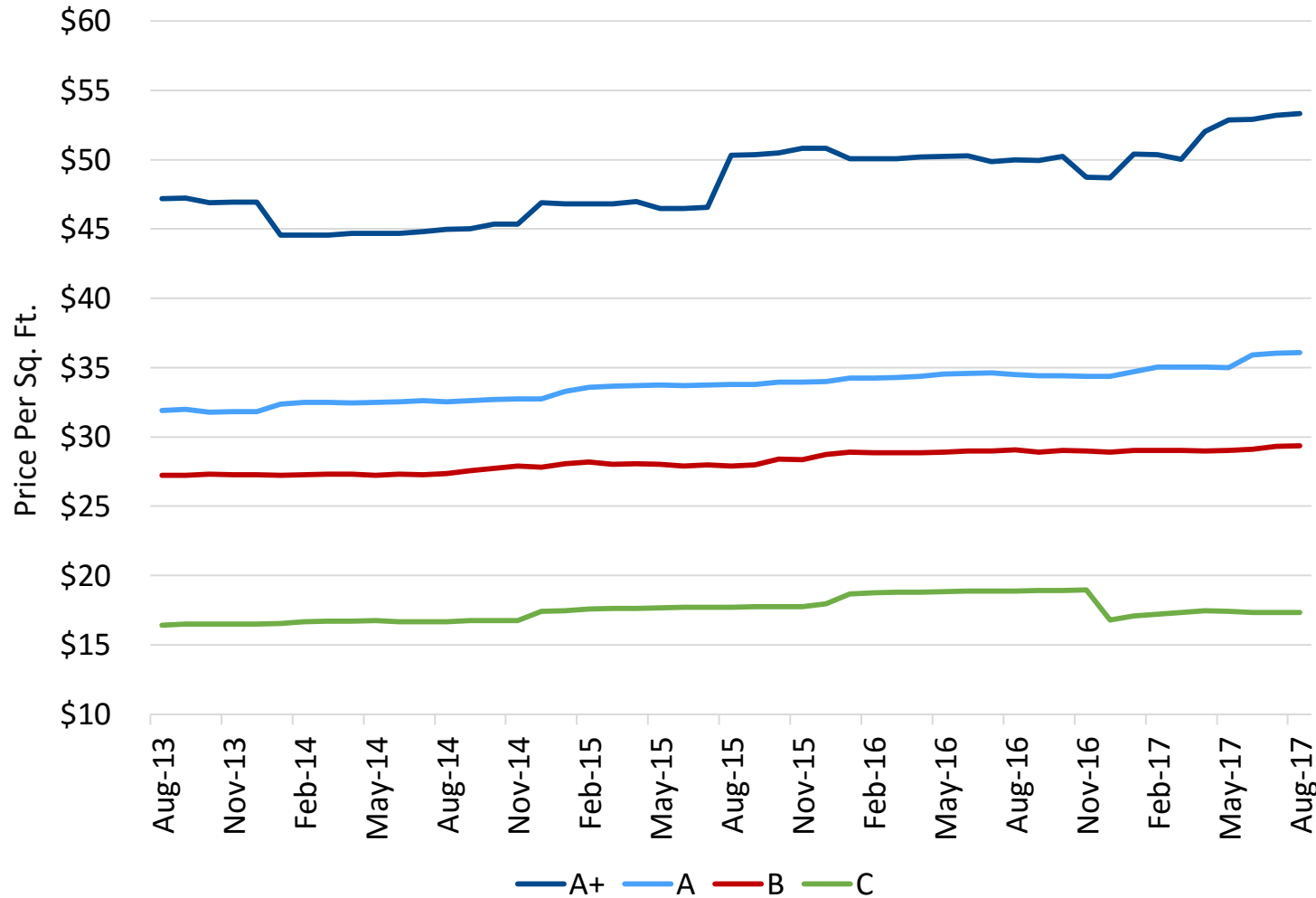


National Office Supply is Expected to Peak in 2017



Office Lease and Vacancy Rates

Office Lease Rate by Asset Class



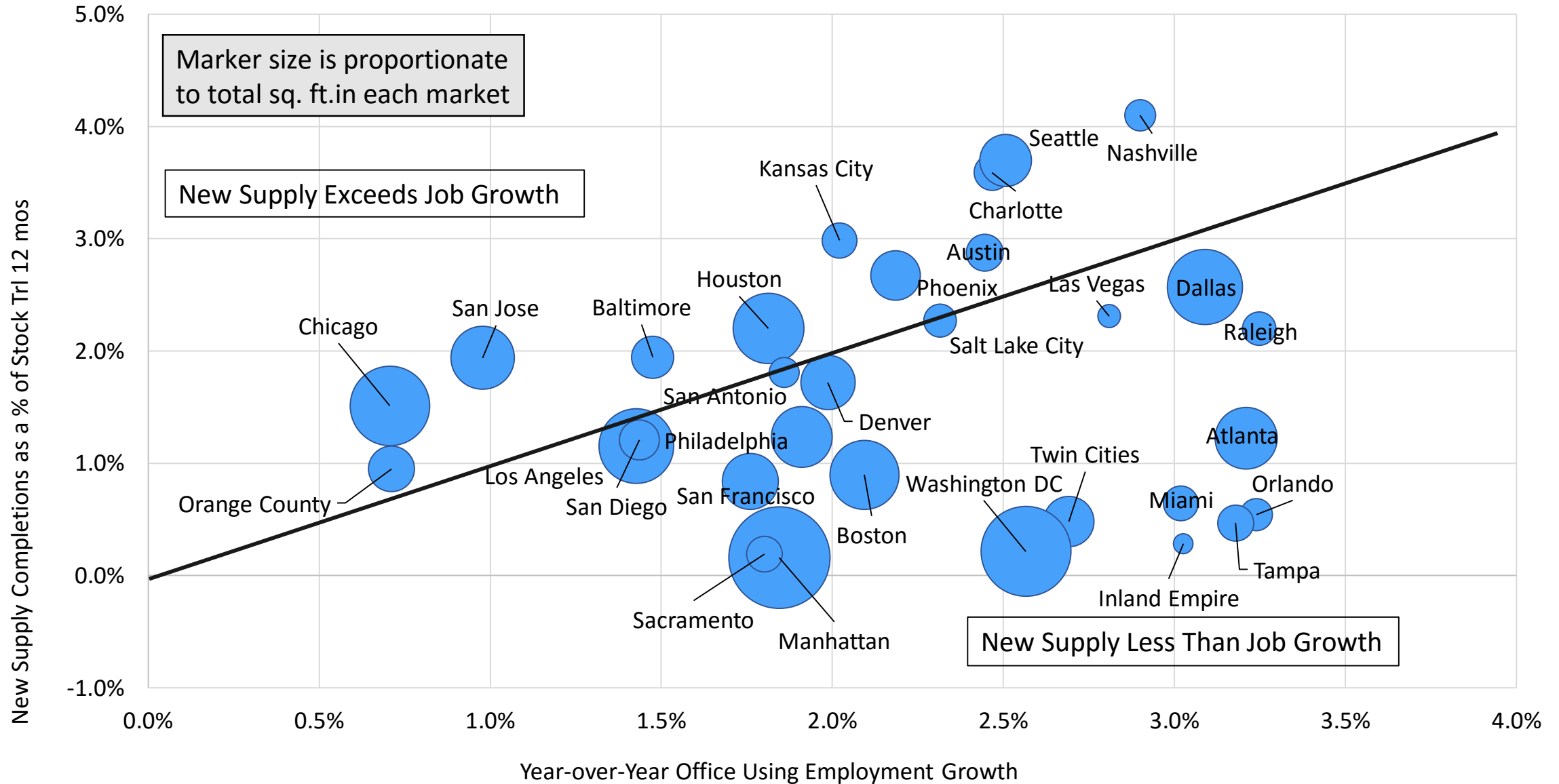
Market	Vacancy Rate excluding Sublease	Vacancy Rate Including Sublease
Atlanta	15.3%	15.7%
Bay Area	12.9%	14.9%
Denver	13.1%	13.3%
Fort Lauderdale	14.9%	15.2%
Houston	18.9%	21.7%
Inland Empire	15.4%	15.6%
Los Angeles	13.9%	14.3%
Manhattan	7.1%	8.0%
Miami	12.3%	13.1%
Orange County	10.8%	10.9%
Phoenix	17.7%	18.7%
Sacramento	13.8%	14.1%
San Diego	12.1%	12.7%
San Francisco	7.5%	8.9%
West Palm Beach - Boca Raton	15.9%	16.3%

Office Vacancies and Rent Trends

Office lagged the multifamily sector and is still absorbing space, with limited new supply

Metro	Office: Vacancy excluding Sublease	Office: Vacancy including Sublease	Office: Leases Rent Growth Jan 2017-May2017	Office: Under Construction New Supply % of Stock
Los Angeles	12.1%	12.7%	0.8%	3.8%
Orange County	10.0%	10.1%	0.6%	2.5%
San Diego	10.7%	11.3%	-0.2%	1.1%
Inland Empire	15.6%	15.6%	0.0%	0.8%
San Francisco	7.2%	8.4%	2.3%	6.6%
Bay Area	11.6%	13.3%	1.7%	7.0%
Phoenix	16.1%	16.8%	0.8%	1.3%
Atlanta	14.1%	14.2%	0.8%	3.1%
Miami	10.6%	11.2%	-0.4%	3.2%
Fort Lauderdale	14.4%	14.7%	-0.7%	2.3%
West Palm Beach	14.5%	14.8%	0.3%	0.2%
Manhattan	7.4%	7.8%	0.6%	3.8%

Office-Using Employment Growth Outpacing Supply



Office – Under Construction Inventory as a % of Stock

Primary Markets

Market	Under Construction % of Stock
Boston	2.5%
Chicago	2.0%
Los Angeles	2.0%
Manhattan	4.2%
San Francisco	7.4%
Washington DC - Suburban Maryland	2.3%
National Average	2.5%

Office – Under Construction Inventory as a % of Stock

Secondary Markets

Market	Under Construction % of Stock
Atlanta	3.9%
Austin	6.0%
Bay Area	6.4%
Brooklyn	14.8%
Charlotte	4.1%
Dallas - Fort Worth	5.2%
Denver	2.9%
Houston	1.0%
Inland Empire	2.4%
Las Vegas	1.0%
Miami	3.6%
Minneapolis - St. Paul	0.9%

Market	Under Construction % of Stock
Portland	5.3%
Nashville	4.9%
Orange County	2.3%
Orlando	2.3%
Philadelphia	2.4%
Phoenix	1.8%
Raleigh - Durham	3.9%
Sacramento	0.3%
Salt Lake City	0.9%
San Diego	1.0%
Seattle	6.2%
National Average	2.5%

Office – Under Construction Inventory as a % of Stock

Tertiary Markets

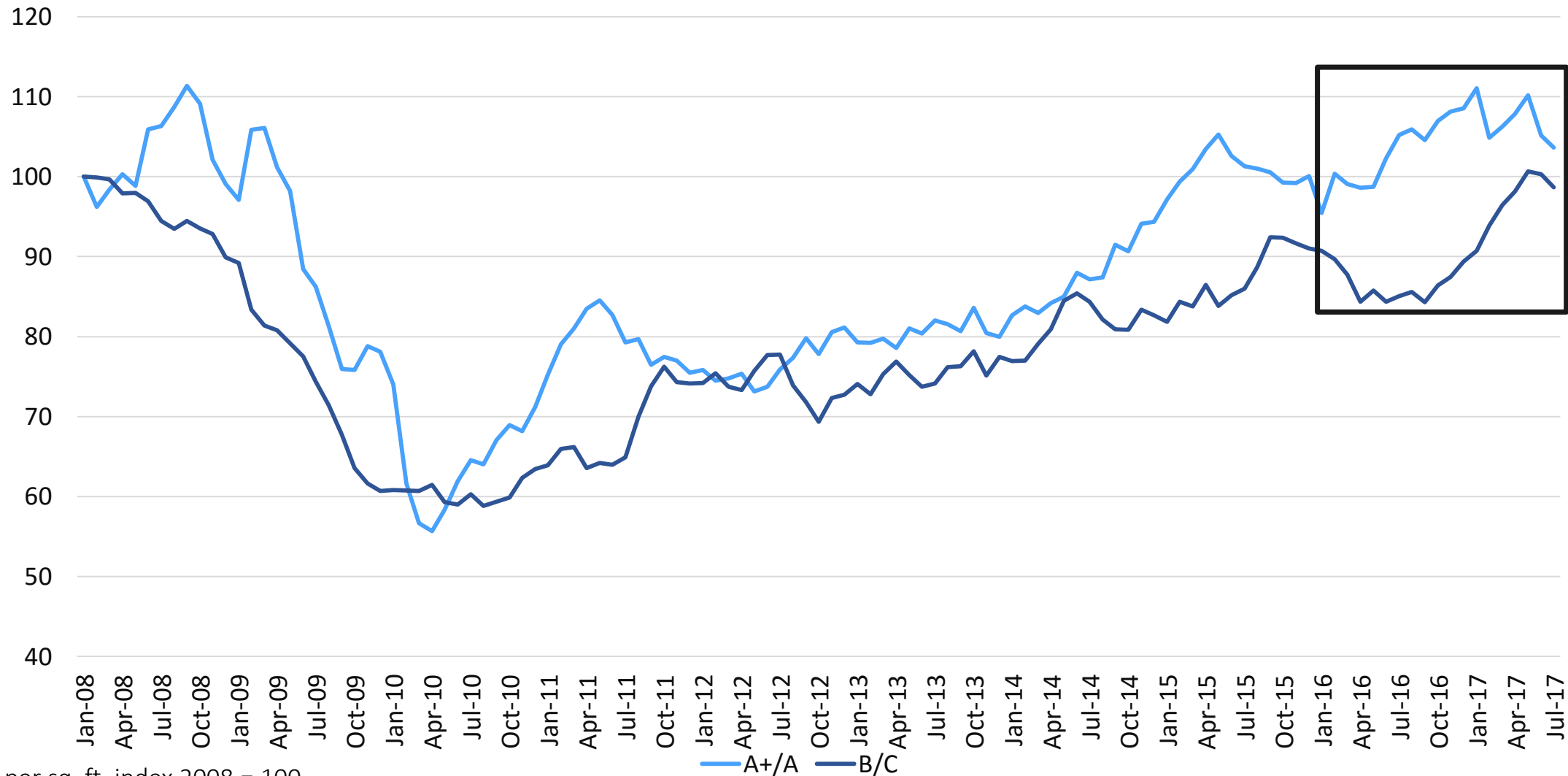
Market	Under Construction % of Ctock
Baltimore	1.7%
Birmingham	1.1%
Bridgeport – New Haven	0.3%
Buffalo	0.9%
Central Valley	0.9%
Cincinnati	1.6%
Cleveland - Akron	0.7%
Columbus	2.3%
Dayton	0.2%
Detroit	0.7%
Fort Lauderdale	0.7%

Market	Under Construction % of Stock
Grand Rapids	1.4%
Huntsville	1.7%
Indianapolis	0.6%
Jacksonville	0.5%
Kansas City	0.1%
Lexington	0.6%
Long Island	0.1%
Louisville	1.8%
Memphis	5.0%
Mobile	1.5%
New Jersey	0.9%

Market	Under Construction % of Stock
Pittsburgh	0.4%
Portland ME	0.8%
Providence	2.2%
Rochester	1.9%
San Antonio	2.1%
South Carolina	1.0%
Southwest Florida Coast	7.2%
Tampa - St Petersburg - Clearwater	0.6%
West Palm Beach - Boca Raton	0.2%
Winston-Salem - Greensboro	0.4%
National Average	2.5%

Office Price Per Sq. Ft. Index 2008-2017

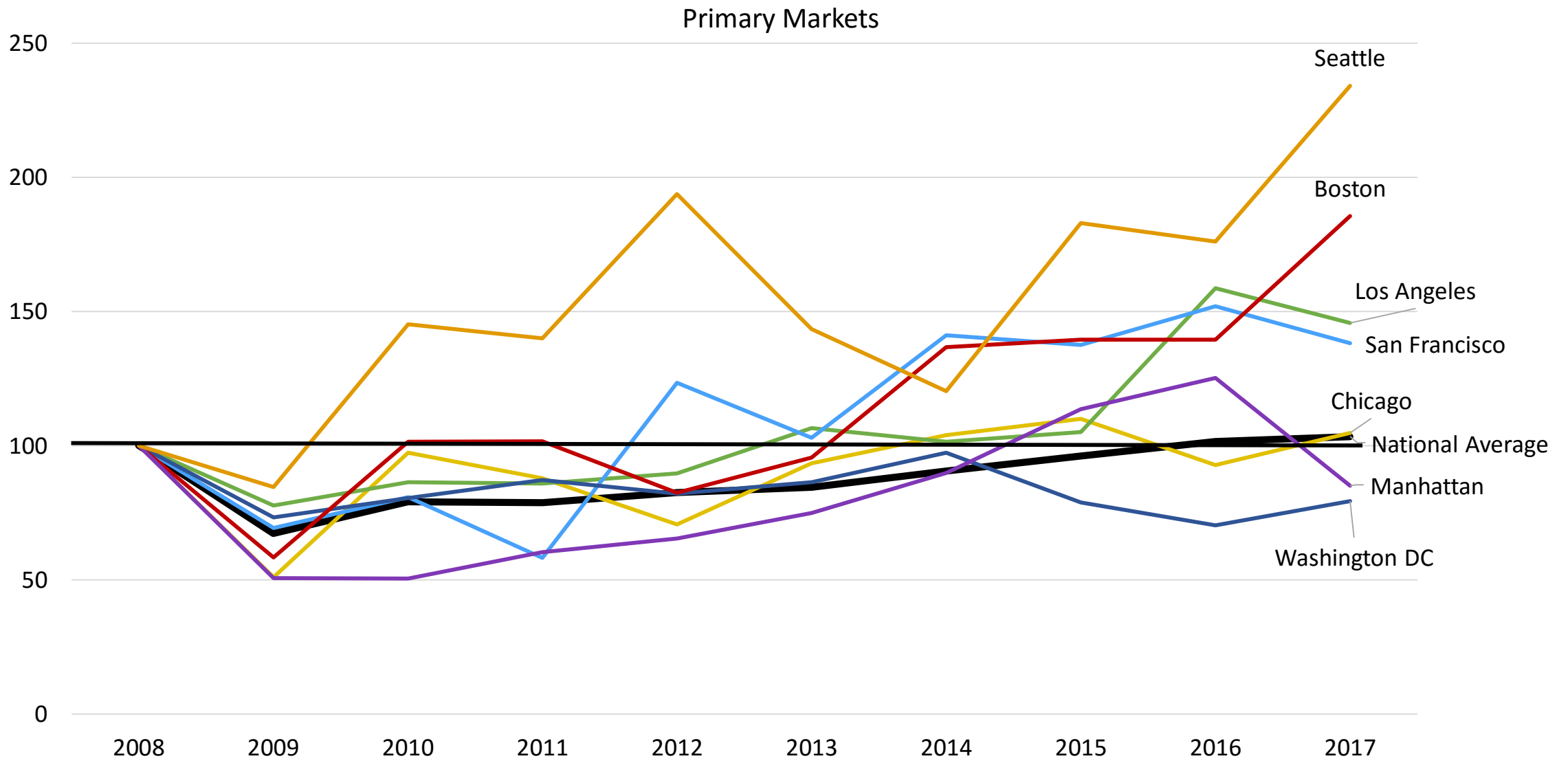
Class A/A+ Has Flattened, While Class B/C Has Steadily Increased



Sales price per sq. ft. index 2008 = 100

Source: Yardi®Matrix

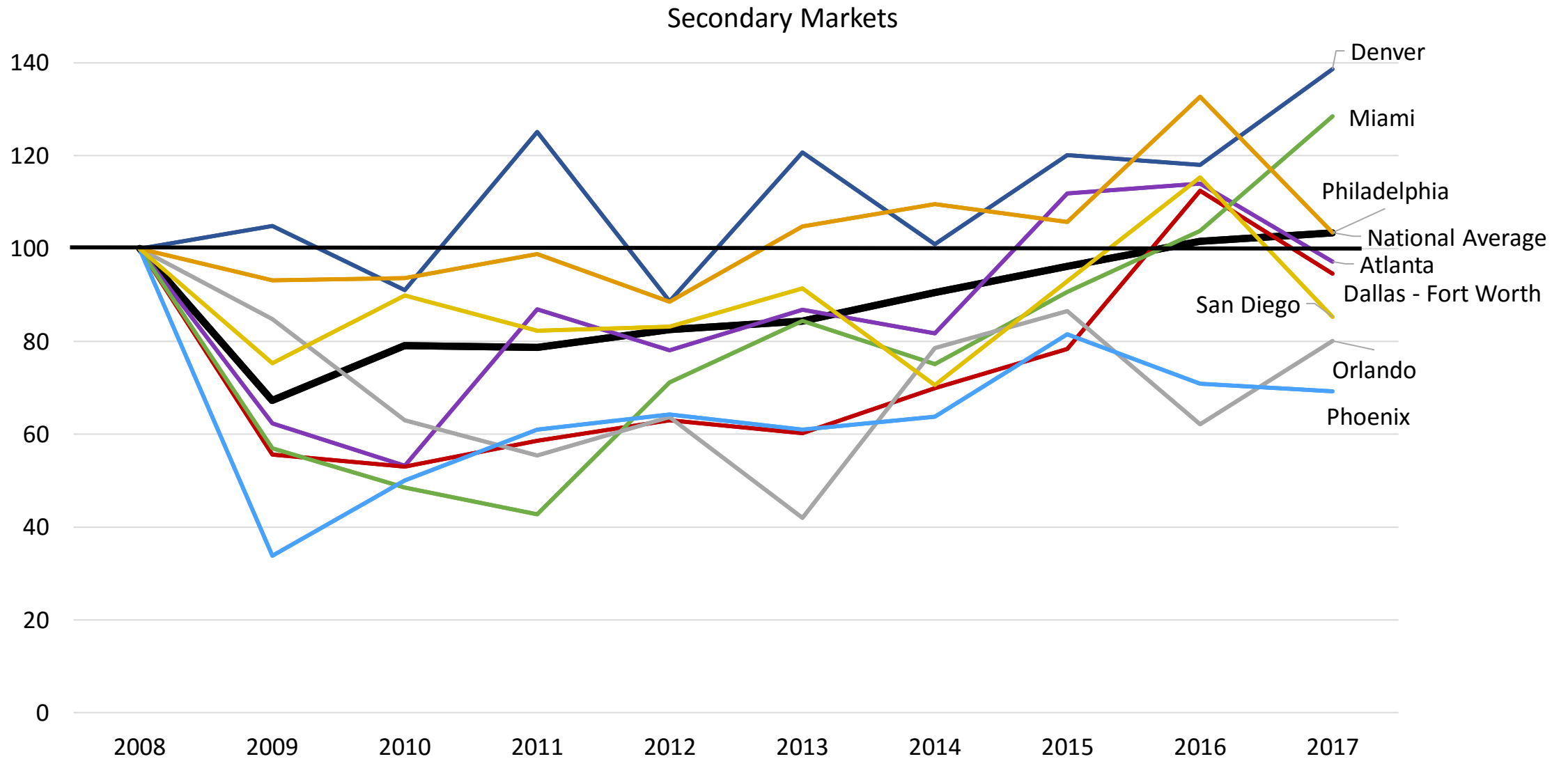
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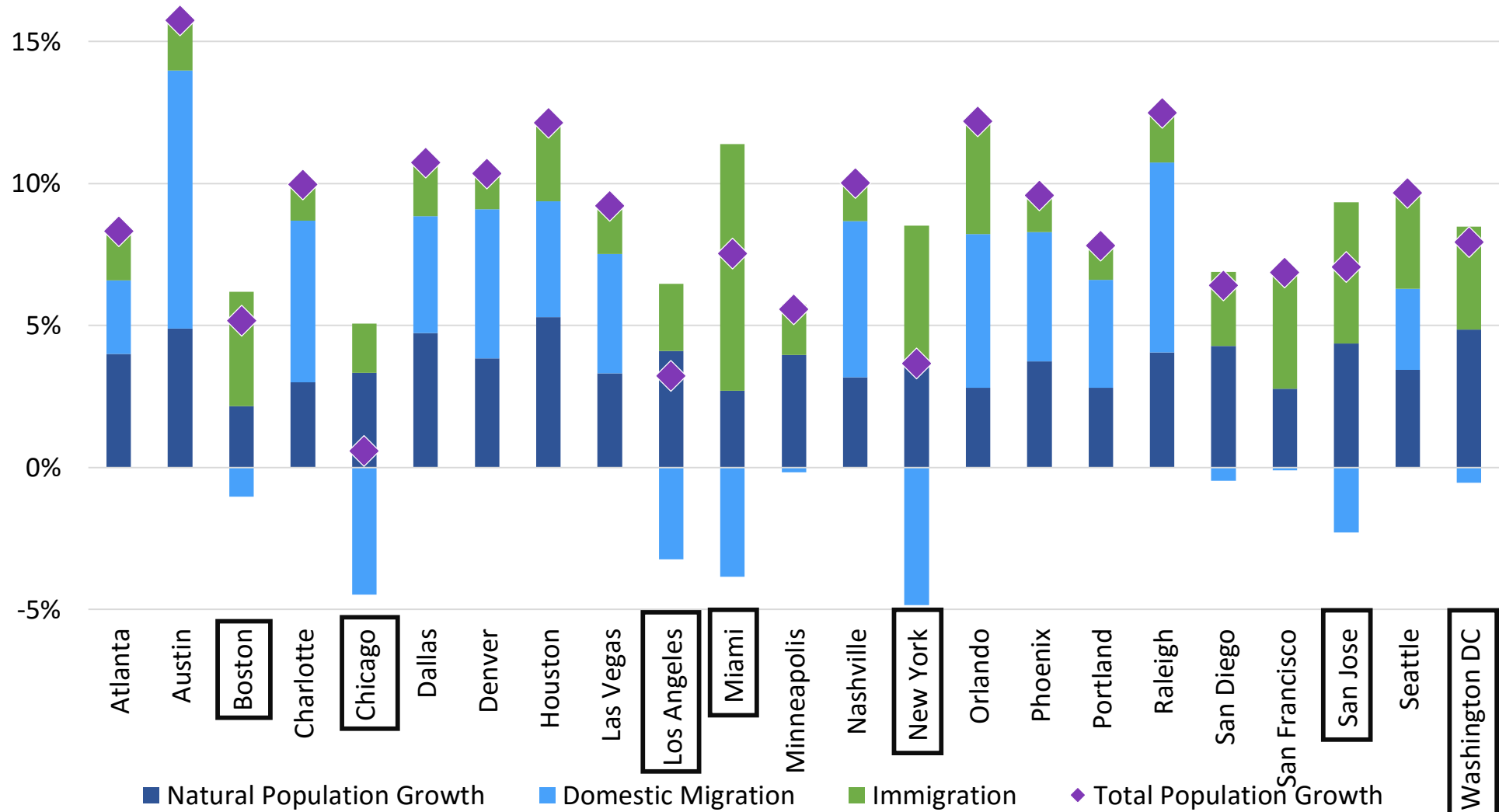
Sales Price Per Sq. Ft. Index 2008-2017



Sales price per sq. ft. index 2008 = 100

Source: Yardi®Matrix

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

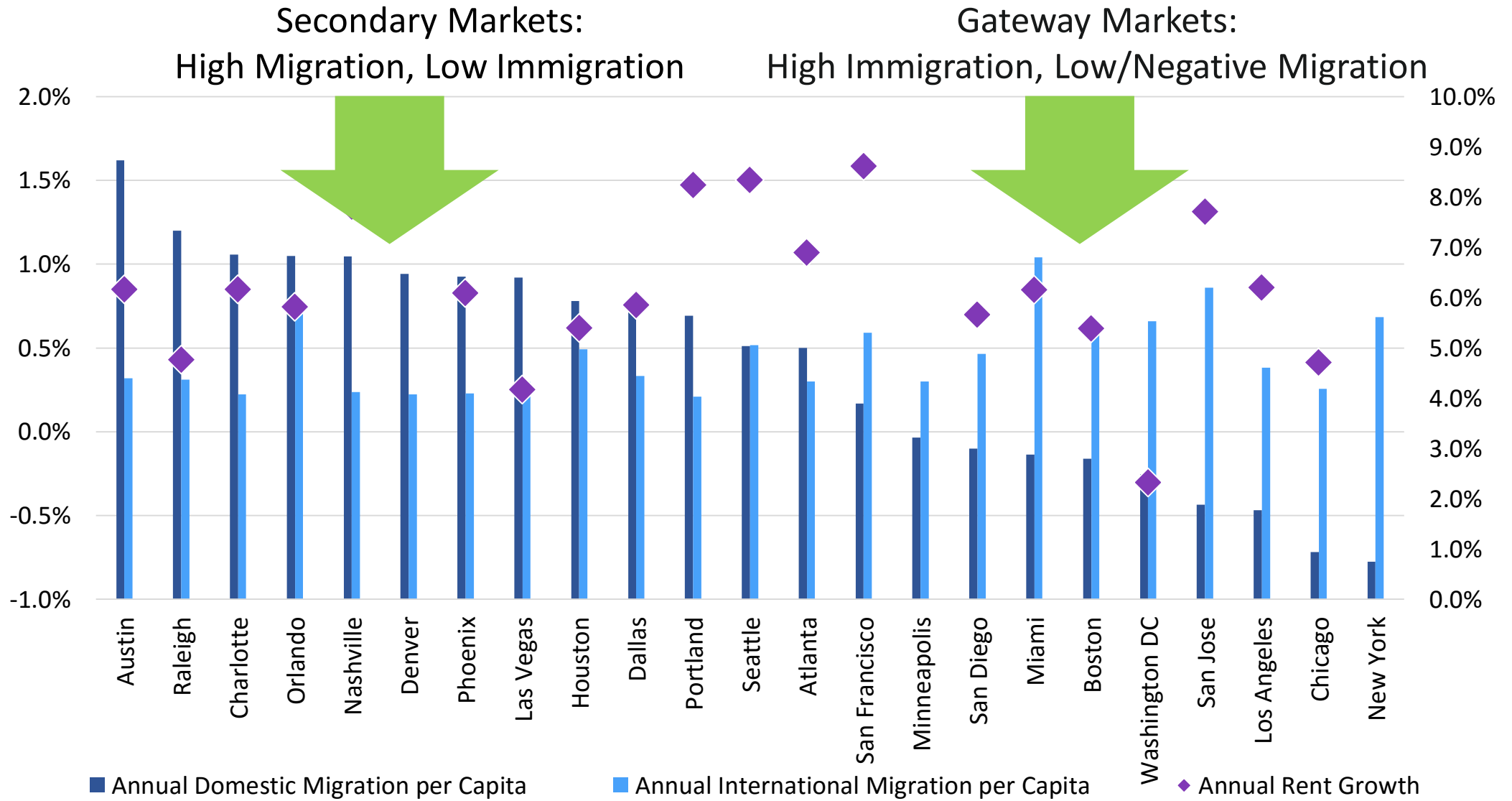
Tech

Restrictive Borders

- Miami
- Orlando
- Los Angeles

Hospitality
Hospitality, Construction
Construction

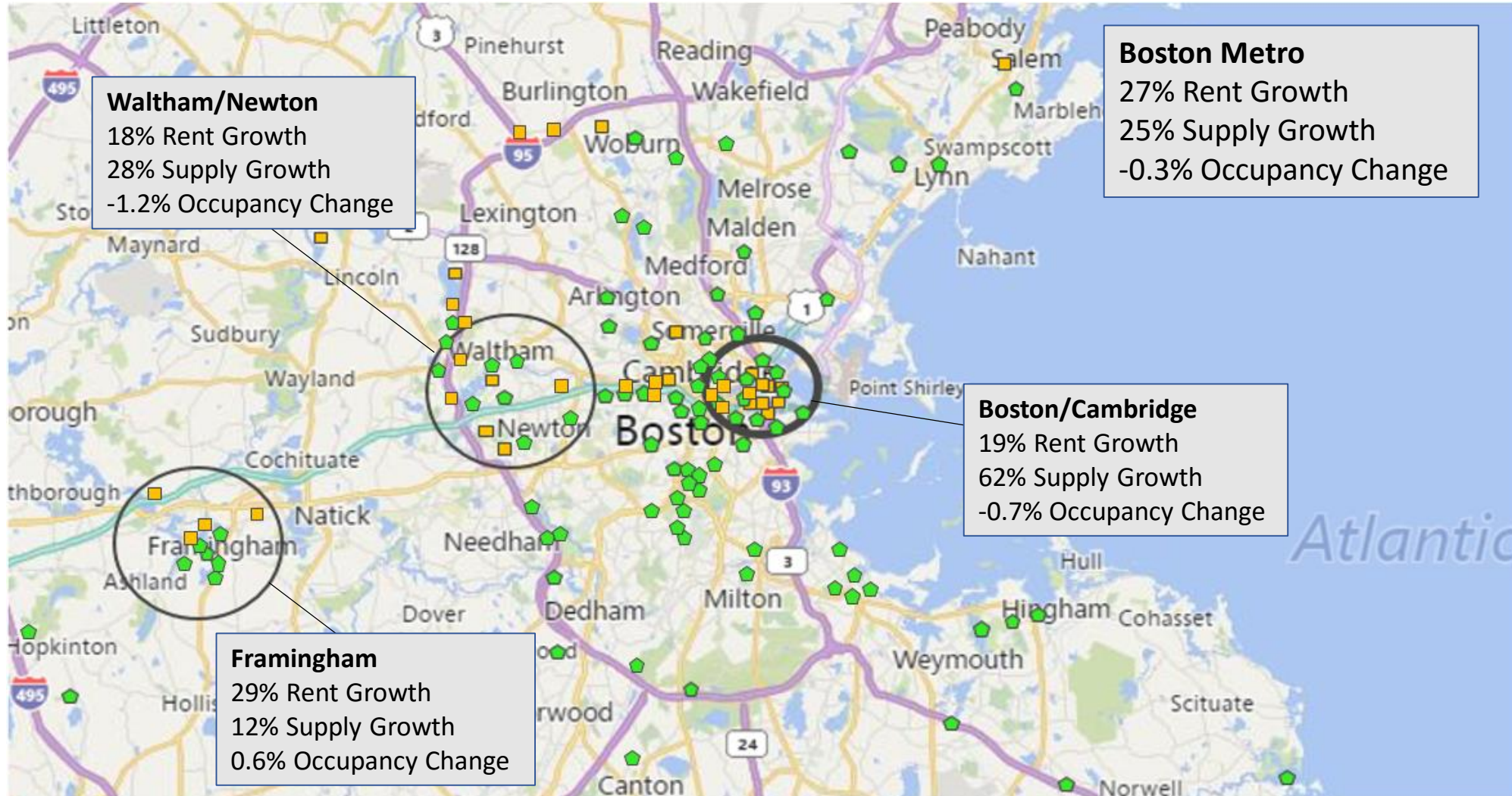
Immigrant vs Domestic Migrant Patterns



*2012-2016 Migration Data

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

Intellectual Capital Nodes - Boston



■ Office Development

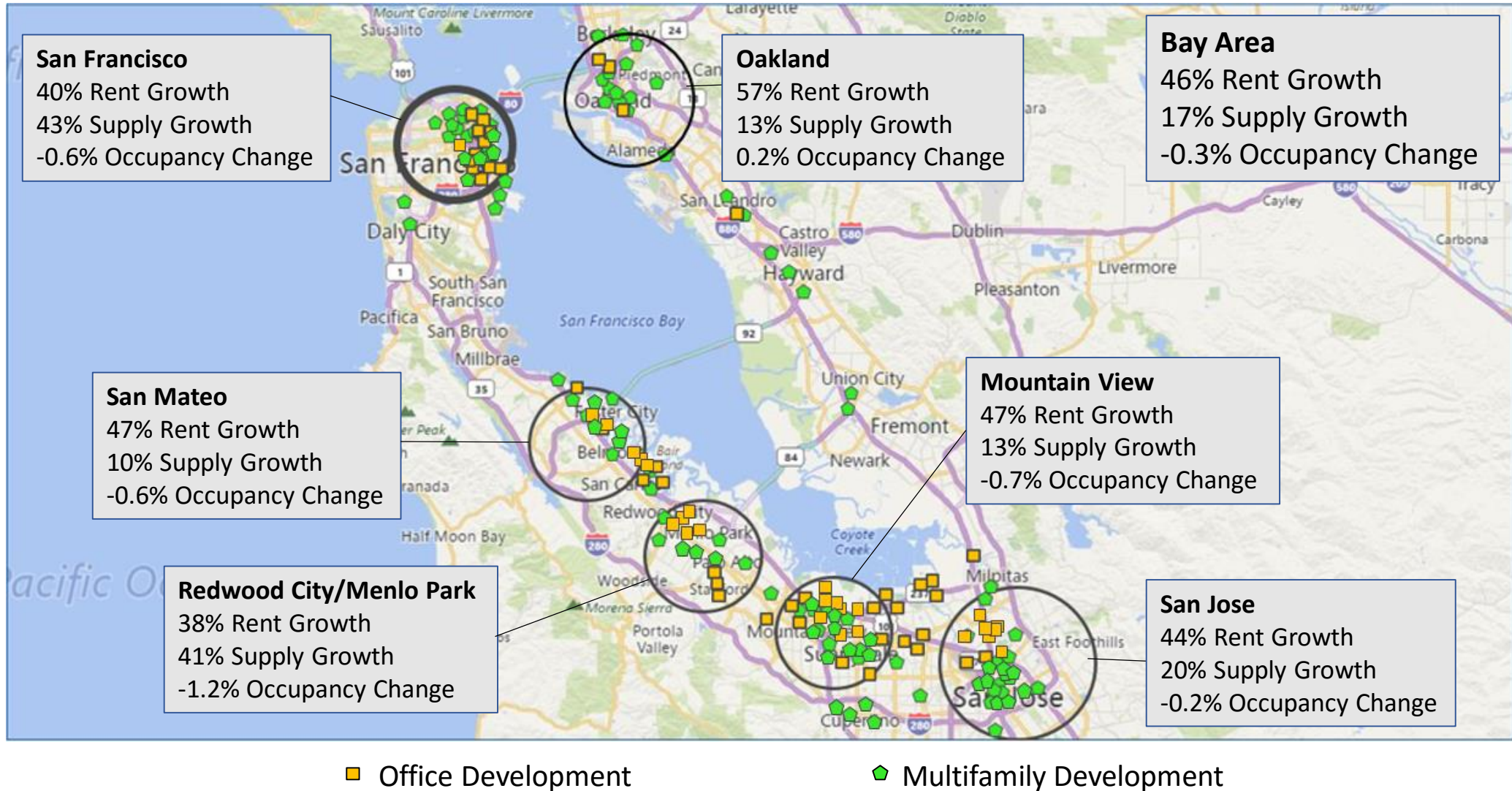
◆ Multifamily Development

* Multifamily rent growth based on May 2012 through May 2017

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

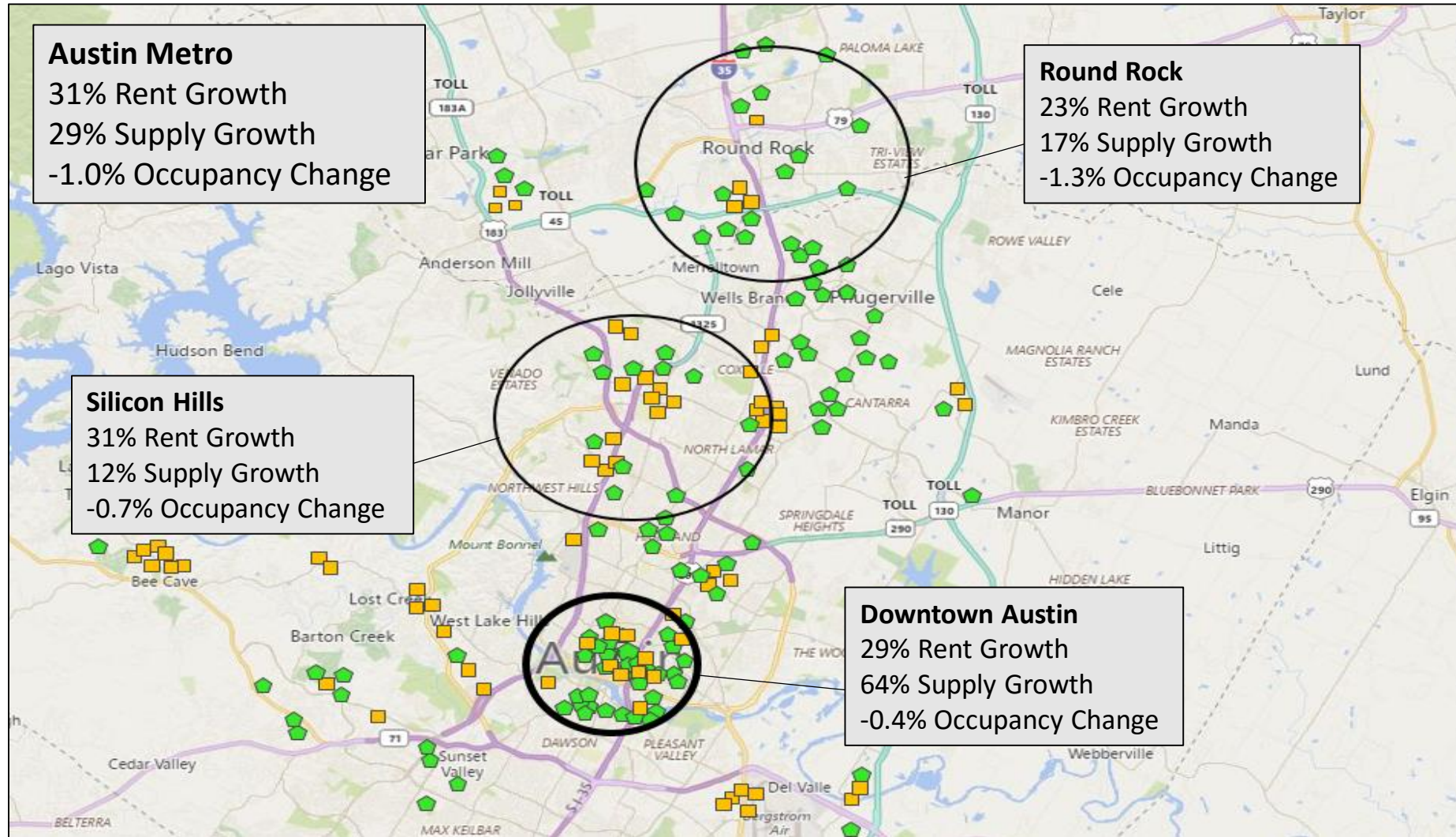
Source: Yardi® Matrix

Intellectual Capital Nodes – San Francisco



* Multifamily rent growth based on May 2012 through May 2017
 * Change in multifamily occupancy based on April 2016 through April 2017

Intellectual Capital Nodes - Austin



■ Office Development

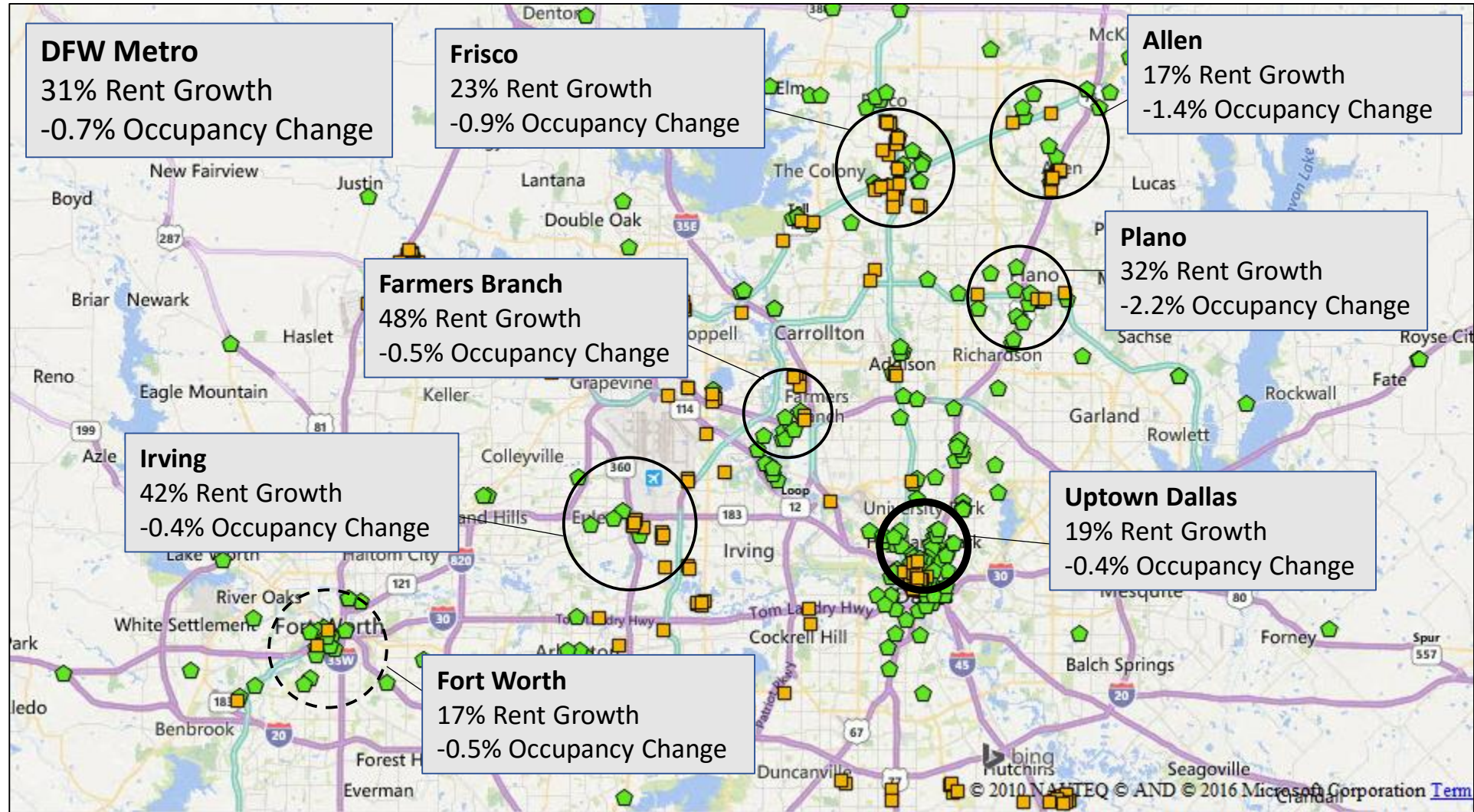
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Source: Yardi® Matrix

Intellectual Capital Nodes – Dallas-Fort Worth



■ 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

So What? Real Estate Fundamentals

- The next 18-24 months will be a “slow-grind” while office using employment slowly increases,
 - New supply in key markets needs to get absorbed
 - Int’l Gateway City out-migration will accelerate as the cycle lengthens
 - International gateway cities are most impacted by federal immigration policy
- 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, Leasing cycle time and visibility

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

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

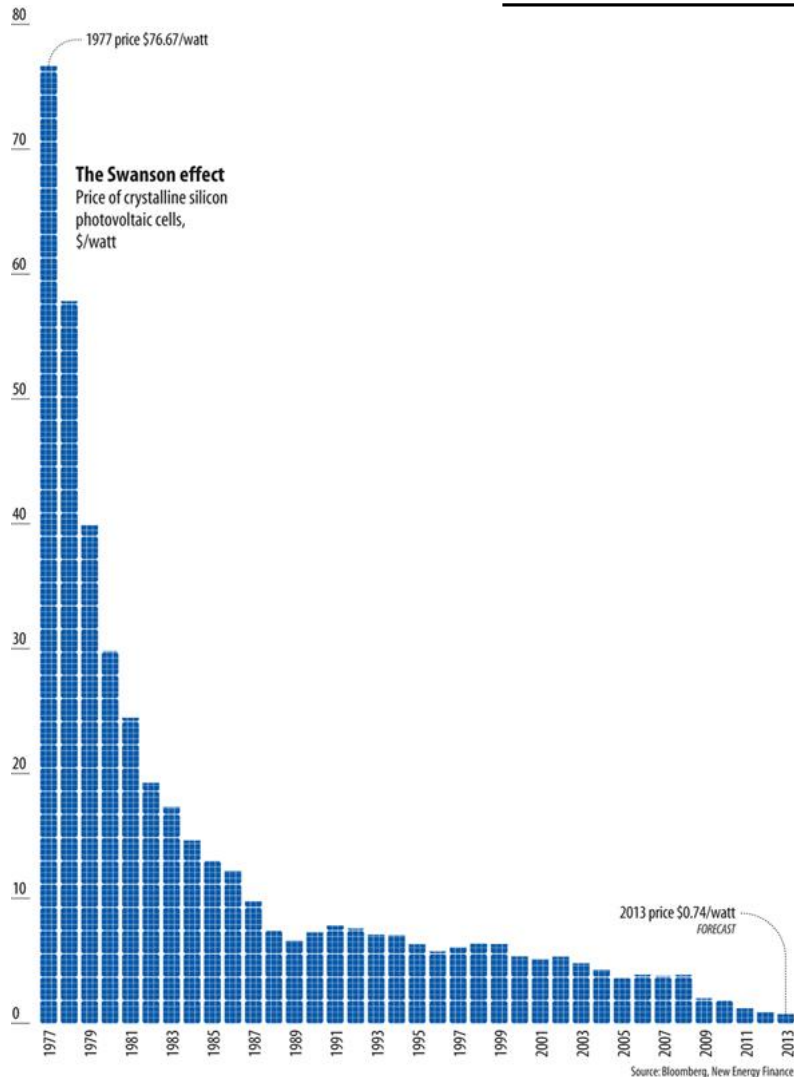
- Islands
- Peak Load Pricing



Photo: EPFL

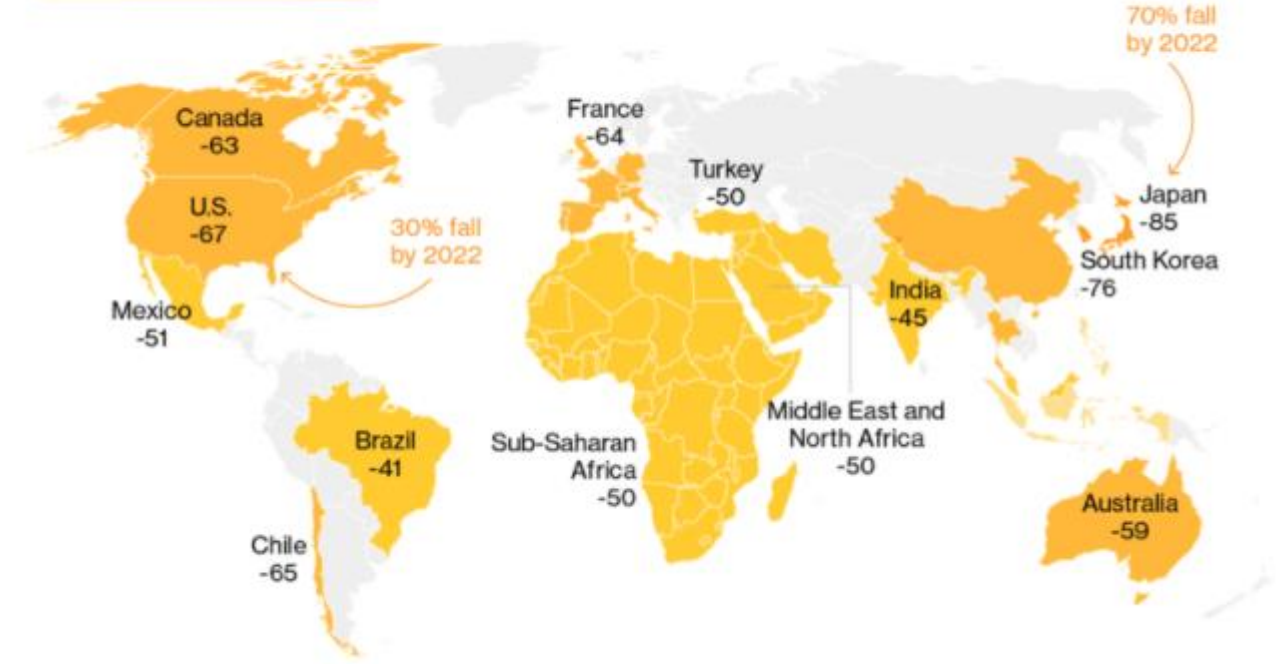
Solar Energy is Becoming More Affordable

The Cost of Solar Photovoltaic Panels Over Time



A Brighter Future

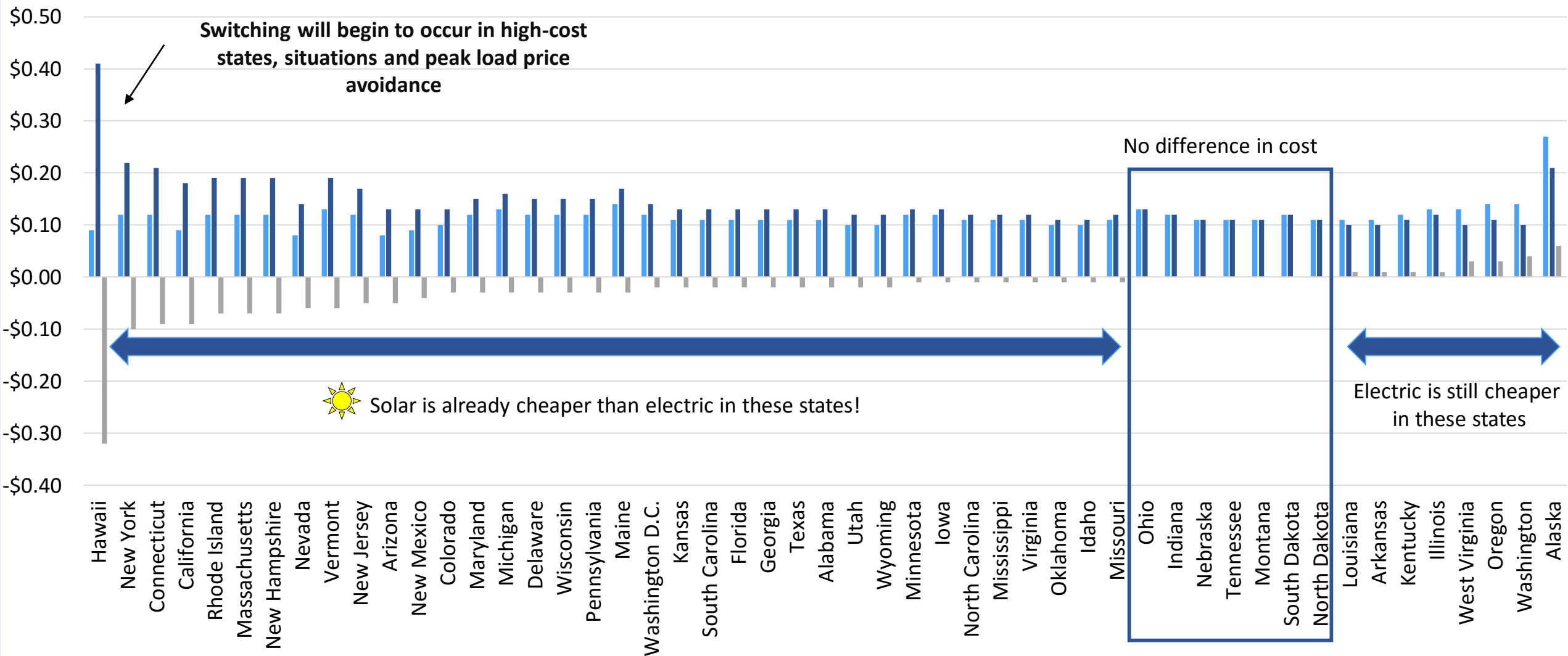
Solar costs will sink 67% in U.S. and 85% in Japan by 2040



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

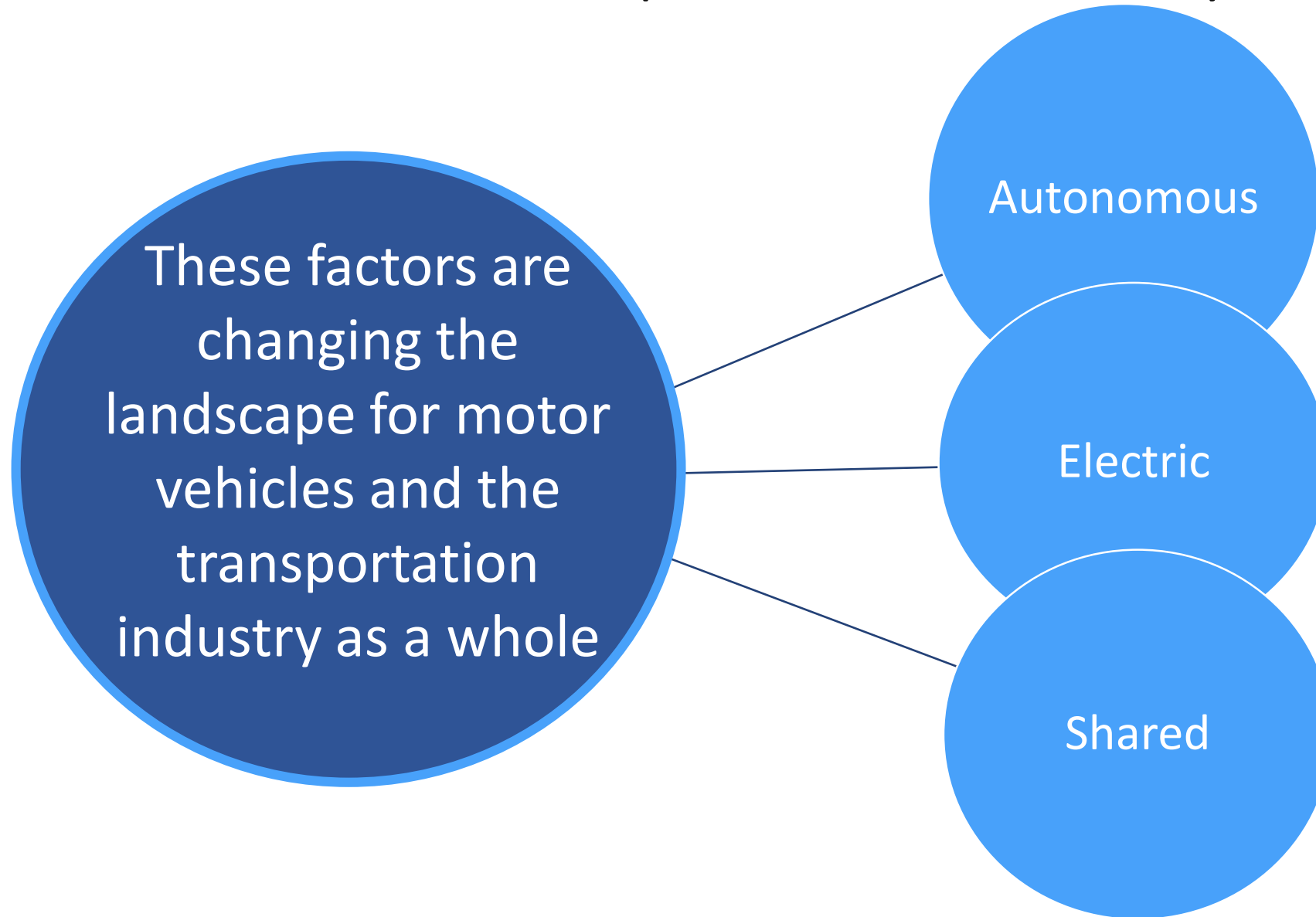
Source: Deutsche Bank

Tesla'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!



The Consumer Transportation Industry is Changing

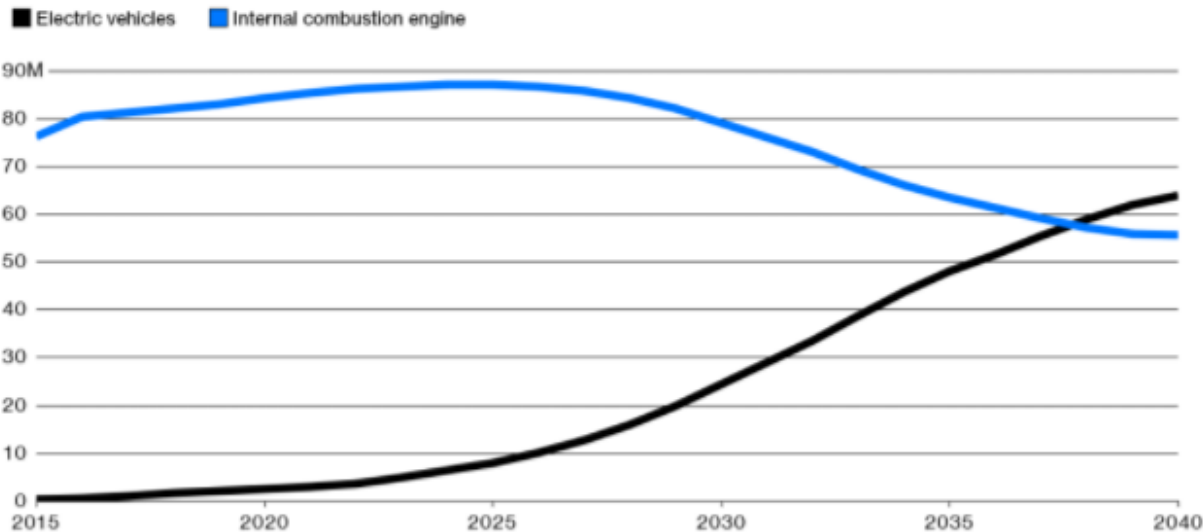


Electric Vehicles Will be the Standard in Coming Years

- 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

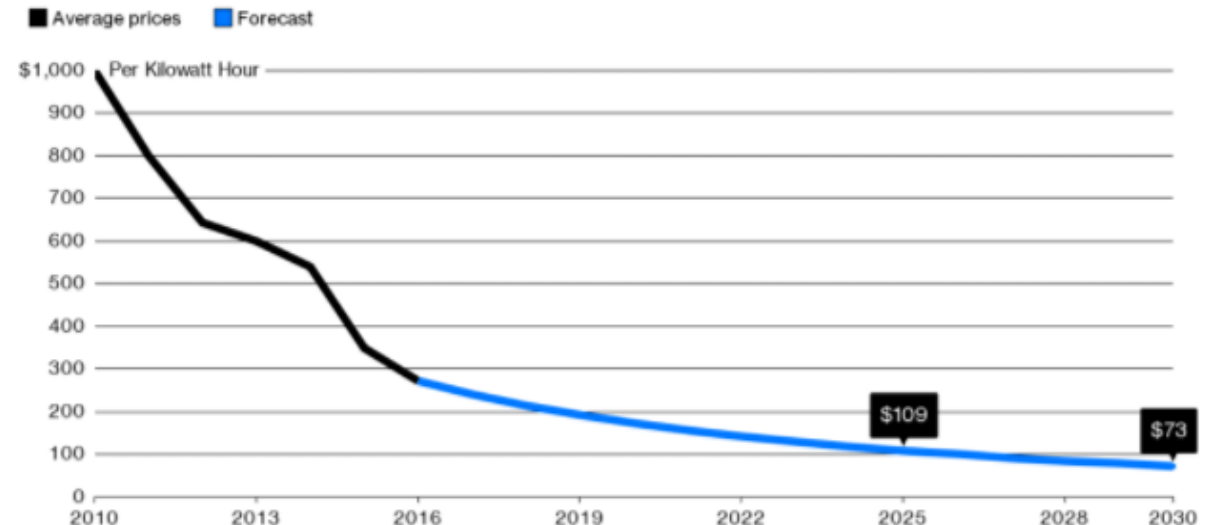
Electric vehicle sales will surpass internal combustion engine sales by 2038



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

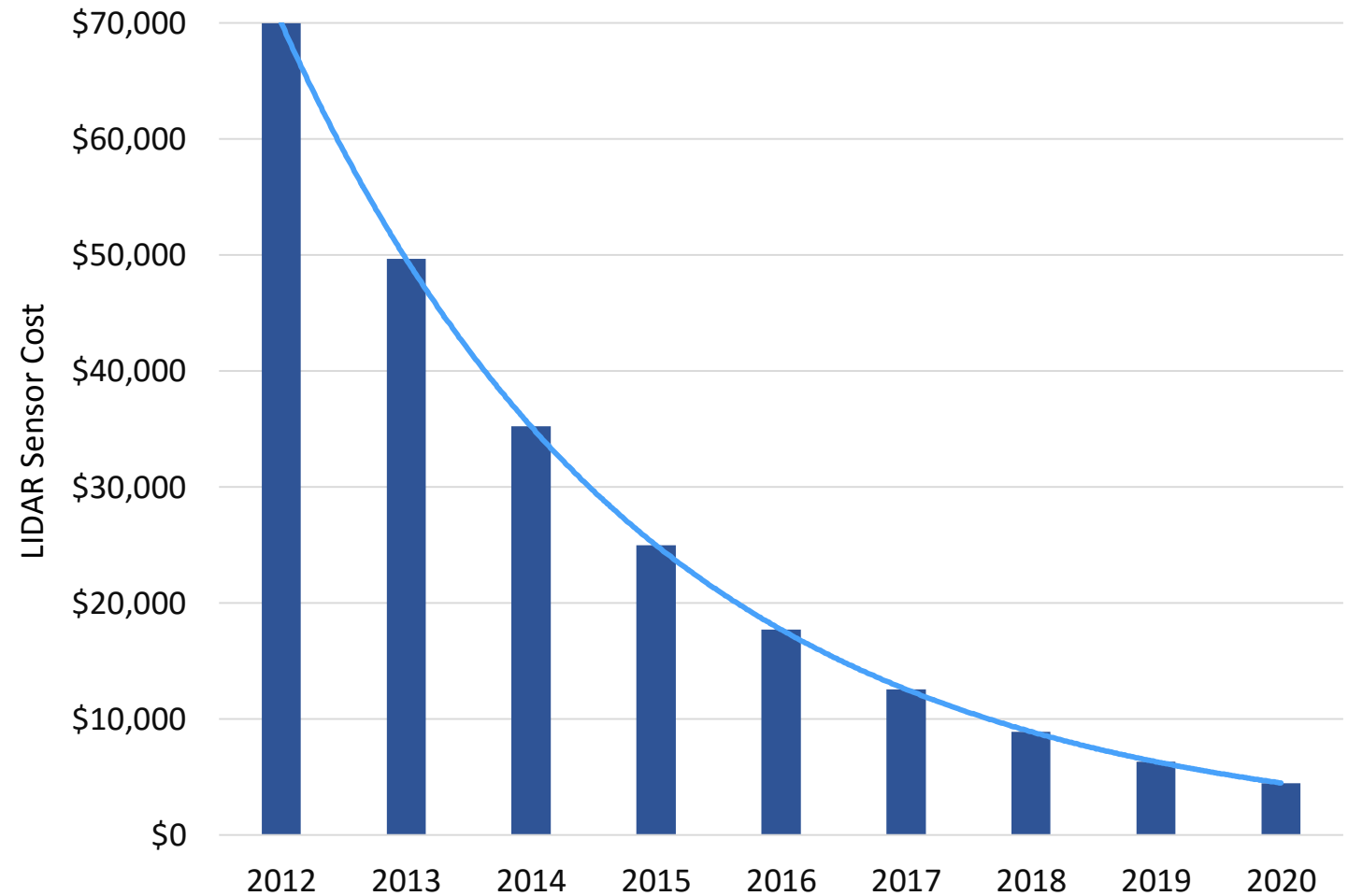
- Google's self-driving car project, now 'Waymo', has 3 million miles self-driven
- Nissan, BMW, and Mercedes have pledged to have autonomous vehicles ready by 2020
- Tony Seba: autonomous vehicles will save lives, save time, save space, save energy, and save money

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

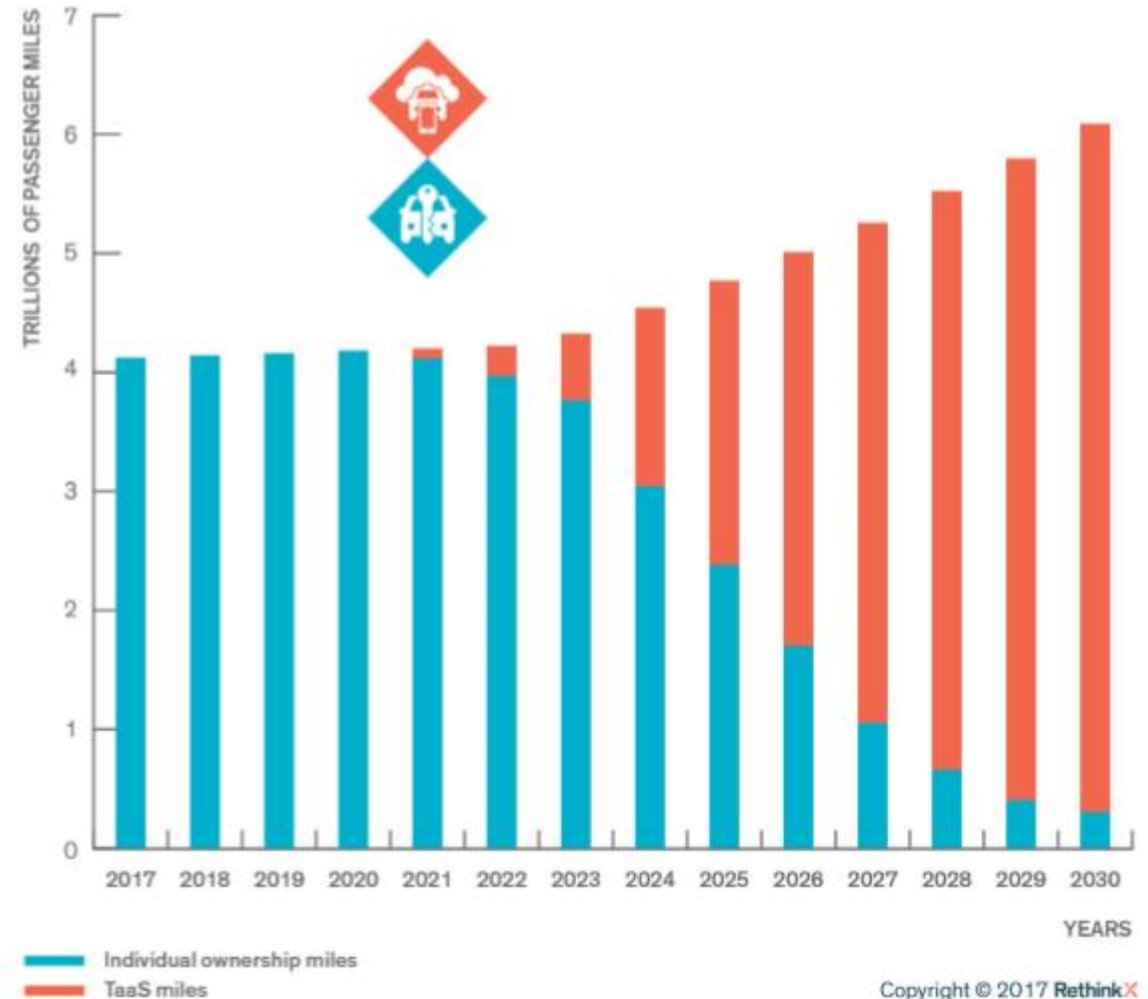
UBER

- 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 the process for thinking how these technological disruptors will impact live/work/play environments
 - **You may be forced to take a more active role in the energy utility business**
 - **You may have more land than you think!**
 - **Efficiency is the play for the next 2 years, disruption in the next 10**

Disclaimer

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