2020 Real Estate Forecast
WHERE ARE WE HEADED?
2020 Real Estate Forecast – Where are we Headed?

I. American Metropolis
   A. Past Influences
   B. Future Influences

II. GDP and the Fed
   A. Business Investment and Consumer Spending
   B. Other Metrics

III. Capital Market
   A. Equity Markets and Property Returns
   B. Debt Markets

IV. Property Type Performance (appendix)
Past Influences on the Built Environment
Top Ten Influences on Metropolitan America:

1. The 1956 Interstate Highway Act

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Unintended consequence: suburban sprawl.

Top Ten Influences on Metropolitan America:

2. Federal Housing Administration Mortgage Financing and Subdivision Regulation
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2. Federal Housing Administration Mortgage Financing and Subdivision Regulation

Unintended consequence: Redlining

Top Ten Influences on Metropolitan America:

3. De-industrialization of Cities

Consequence: Urban/suburban wage gap and income inequality

Top Ten Influences on Metropolitan America:

4. Urban Renewal: Downtown Redevelopment and Public Housing Projects (1949 Housing Act)

Top Ten Influences on Metropolitan America:

4. Urban Renewal: Downtown Redevelopment and Public Housing Projects (1949 Housing Act)

Consequence: Hyper-concentration of the poor

Future Influences on the Built Environment
Future Influences on Metropolitan America:

1. Income/Wealth Disparity
The income-productivity gap began over 40 years ago.

Disconnect between productivity and typical worker’s compensation, 1948–2013

- 1948–1973: Productivity: Up 96.7% Hourly compensation: Up 91.3%
- 2013: 243.1%
the income gap is likely to continue as college enrollment is highly correlated with family income.

Source: Richard Reeves and Eleanor Krause, Raj Chetty in 14 Charts: Big findings on Opportunity and Mobility We Should All Know, Brookings, January 11, 2018.
Future Influences on Metropolitan America

2. Machine learning and autonomous vehicles

How is Your Food Being Delivered?

Source: Badger Herald, 11/4/2019
Machine learning and big data

1. Past analysis relied on theory driving analysis and functional form: i.e.
   \[ Y = b_0 + b_1 x_1 + b_2 x_2 + \ldots + b_n x_n \]

2. In machine learning, the machine determines the relationship and functional form?

3. Real estate examples
   - Mortgage underwriting
   - Rating agencies
   - CoStar

4. Autonomous vehicles and Medicine example

Source: Economist, Self-Driving Cars will Require a New Business, Model, March 1, 2018.
Autonomous Vehicles

Private automobiles are used 5% of the time – huge cost per use.

1. Will congestion get better or worse, what about congestion pricing?

2. Uber distance or AV distance impact on the built environment?

3. What to do with old parking structures – 3-D printing areas? . . . .
Will your family vacation in 2028 look like this . . . .
or will your drive to work be without a steering wheel, GM’s version of an autonomous vehicle
Will your next Pappy Van Winkle Family Reserve come from a beaker? Ethanol and some sugars, salts, acids and compounds like ethyl esters. . . .
Influences on Commercial Real Estate
20-year property returns are stable and competitive . . . .

<table>
<thead>
<tr>
<th>Market Index Comparisons (through 2019Q2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>National Property NCREIF Index, (no leverage)</td>
</tr>
<tr>
<td>S&amp;P 500 Index</td>
</tr>
<tr>
<td>NAREIT (averages 35% leverage)</td>
</tr>
<tr>
<td>T-Bills</td>
</tr>
<tr>
<td>CPI</td>
</tr>
</tbody>
</table>

Source: NCREIF Real Estate Performance Report, 2019Q2, and Graaskamp Center for Real Estate.
Property prices have appreciated at a 4.4% compound annual rate of growth over the past 20 years.

Source: Mortgage Bankers Association, Commercial/Multifamily Databook 2019Q3.
Of the 4.4% property price growth over the past 20 years . . . .

. . . . 2.5% came from cap rate compression.*

* Based on NCREIF transaction-based cap rates compressed from of 8.98% in 2000 to 5.40% in 2019.
capital expenditures consumed almost all of that additional appreciation . . . .

Even with current cap rates, spreads over US Treasuries are reasonable.

**NCREIF Transaction-Based Equal Value Cap Rate to 10-Year U.S. Treasury Spread**

1993-2019Q3 (one-year moving average for UST)

- **26-year Average = 3.07%**
property income growth remains robust, sans retail.

Source: NCREIF and the Graaskamp Center.
past real estate returns have exceeded expectations, future returns will meet future expectations – barely.

<table>
<thead>
<tr>
<th>Commercial Real Estate Returns -- Past and Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commercial Real Estate Return Profile 2000-2019</strong></td>
</tr>
<tr>
<td>NCREIF Cash Flow Yield</td>
</tr>
<tr>
<td>Plus: Property Appreciation</td>
</tr>
<tr>
<td>Less: Capital Expenditures</td>
</tr>
<tr>
<td><strong>Total Return</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Expected Commercial Real Estate Returns 2020-2030</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>NCREIF Cash Flow Yield</td>
</tr>
<tr>
<td>Plus: NOI Growth</td>
</tr>
<tr>
<td>Less: Capital Expenditures</td>
</tr>
<tr>
<td><strong>Expected Return</strong></td>
</tr>
</tbody>
</table>
Where will investment funds invest their dollar. . . .

Sources: Federal Reserve Economic Data, NCREIF, and Graaskamp Center for Real Estate
As assets under management and allocation to real estate doubled between 2001-2019, real estate investment grew from $88 billion to $420 billion.
So why is this important?

At year-end 2017, U.S. retirement assets totalled $28 trillion:

- $16.9 trillion in defined contribution assets – 401(k), 403(b) and IRA
- $9.1 trillion in public and private defined benefit plans
- $2.2 trillion in annuities

Note: As a means of comparison, the total market capitalization of U.S. stocks is about $30 trillion or 144% of GDP.
.... state and local pensions are underfunded ....

Note: In 2017 public pension plans held $3.74 trillion in assets. The median discount rate for public pension plans was 8 percent from 1990-2011, and 7.75 percent in 2012.

. . . . same investments, different holding periods . . . .

Panel A: One-Year Holding Period Investment Returns

Panel D: Seven-Year Holding Period Investment Returns

. . . . benefits of diversification (green provides greater benefit).

**Exhibit 9: Return Correlation Matrices**

**Panel D: Seven-Year Holding Period Return Correlation Matrix**

<table>
<thead>
<tr>
<th></th>
<th>Inflation</th>
<th>Treasury Bills</th>
<th>Government Bonds</th>
<th>Corporate Bonds</th>
<th>Large Stocks</th>
<th>Small Stocks</th>
<th>Real Estate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflation</td>
<td>1.000</td>
<td>0.897</td>
<td>0.832</td>
<td>0.721</td>
<td>0.400</td>
<td>0.326</td>
<td>0.122</td>
</tr>
<tr>
<td>Treasury Bills</td>
<td>1.000</td>
<td>0.956</td>
<td>0.863</td>
<td>0.583</td>
<td>0.379</td>
<td>0.168</td>
<td></td>
</tr>
<tr>
<td>Government Bonds</td>
<td>1.000</td>
<td>0.952</td>
<td>0.559</td>
<td>0.291</td>
<td>0.073</td>
<td>0.073</td>
<td></td>
</tr>
<tr>
<td>Corporate Bonds</td>
<td>1.000</td>
<td>1.000</td>
<td>0.631</td>
<td>0.323</td>
<td>0.016</td>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td>Large Cap Stocks</td>
<td>1.000</td>
<td>0.604</td>
<td>1.000</td>
<td>0.285</td>
<td>-0.072</td>
<td>-0.072</td>
<td></td>
</tr>
<tr>
<td>Small Cap Stocks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Estate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.000</td>
</tr>
</tbody>
</table>

Summary

Past Influences on the Built Environment
  • Federal government policies
  • Unintended consequence

Future Influences on the Built Environment
  • Income inequality
  • Technology – machine learning and autonomous vehicles

Real estate
  • Past 20 years – cap rate compression
  • Institutional interest in the asset class
  • Real estate return variance is low and RE has low correlations with other assets

Source: Federal Reserve Bank, Wage Tracker and The Graaskamp Center.
GDP/Federal Reserve Decision Summary

I. GDP
   • Business Investment will remain narrowly negative in 2020
   • Consumer Spending usually follows Business Investment
   • Consumer Spending is unlikely to have a significant trigger event
   • Outcome: GDP will migrate from 2.0% to 1.0% across 2020

II. The Federal Reserve’s Decision
   • Phillips curve – the inflation – employment relationship
   • Other metrics
   • Outcome: Federal Reserve actions will be limited, with continued accommodation the likely next moves

Source: Federal Reserve Bank, Wage Tracker and The Graaskamp Center.
GDP: 2.0% GDP growth, Y-O-Y to 2019Q3, however 0.66% of the increase is defense (0.27%) and State and Local Government spending (0.39%).

Sources: Federal Reserve Economic Data and Graaskamp Center
GDP: by its components.
GDP: consumption remains robust as business investment wanes.
Business Investment: large repatriated business profits from abroad, $777 billion in 2018, up from $155.08 billion in 2017. . . .
Business Investment: Small business CEOs remain confident while large business CEO do not.
Consumer Spending
. . . . Consumer spending: consumers are limiting big purchases . . . .

---

**Number of existing homes sold in the United States from 2005 to 2020 (in million units)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of homes sold (in million units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>7.08</td>
</tr>
<tr>
<td>2006</td>
<td>6.52</td>
</tr>
<tr>
<td>2007</td>
<td>5.02</td>
</tr>
<tr>
<td>2008</td>
<td>4.12</td>
</tr>
<tr>
<td>2009</td>
<td>4.34</td>
</tr>
<tr>
<td>2010</td>
<td>4.18</td>
</tr>
<tr>
<td>2011</td>
<td>4.26</td>
</tr>
<tr>
<td>2012</td>
<td>4.66</td>
</tr>
<tr>
<td>2013</td>
<td>5.09</td>
</tr>
<tr>
<td>2014</td>
<td>4.94</td>
</tr>
<tr>
<td>2015</td>
<td>5.25</td>
</tr>
<tr>
<td>2016</td>
<td>5.45</td>
</tr>
<tr>
<td>2017</td>
<td>5.51</td>
</tr>
<tr>
<td>2018</td>
<td>5.34</td>
</tr>
<tr>
<td>2019*</td>
<td>5.25</td>
</tr>
<tr>
<td>2020*</td>
<td>5.46</td>
</tr>
</tbody>
</table>

Source: NAR, REALTORS Confidence Index Survey, November 2018.
Consumer spending: vehicle purchases peaked in 2015 at 17.9 million vehicles...
Consumer Spending: Consumers/Investors are taking less risk...
. . . . Consumer spending: however, consumers have debt service and debt capacity . . .
... Consumption: and consumer sentiment remains strong, but turns quickly.
The Federal Reserve Decision

Source: Economist, “America’s Economy is Reisting the Pull of Recession,” October 31, 2019
Unemployment/inflation trade off – the 1960s experience.

Sources: Federal Reserve Economic Data and the Graaskamp Center.
#3 Non-Linear: comparing the 1960s with the current environment

Sources: Federal Reserve Economic Data and the Graaskamp Center.

1960s Unemployment /Inflation as an Analogy for the Current Experience

Sources: Federal Reserve Economic Data and the Graaskamp Center.
The inverted yield curve (10 yr. less 3 mo. UST), a solid a recession predictor.

Source: Federal Reserve Economic Data.
... labor force participation rates are at adjusted mid-2000 levels ...
Baby Boomers are expecting to remain in the workforce longer . . . .
The Global Economy and Trade

.... the China/U.S. trade deficit, currency manipulation . . . .

.... Iran sanctions or worse . . . .

.... Brexit? Germany’s weak economy? The EU? What could possibly go wrong . . . .

.... U.S. consumer get spooked, import prices/tariffs, market volatility, etc.
Real Estate Equity and Debt Markets

There is an abundance of equity capital

Equity investment is maintaining discipline at current cap rates

The debt markets are awash in capital

Leveraged loan funds pushing traditional bank lender underwriting standards, 2019Q3 reveals some bank lending retreat, leveraged loan volume will tighten
Equity Capital Markets and Property Returns (Largely Covered)
Real estate transaction volume off 6% YOY, pricing remains relatively disciplined.

Real Estate Debt Capital Markets
Private debt as a percent of GDP has fallen from 171% in 2009 to 148% today.

Source: Federal Reserve Economic Data and the Graaskamp Center.
. . . . commercial real estate debt outstanding has grown over the last several years . . . .

<table>
<thead>
<tr>
<th>Period</th>
<th>3-Year</th>
<th>5-Year</th>
<th>10-Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial through 2019Q1</td>
<td>6%</td>
<td>6%</td>
<td>2%</td>
</tr>
<tr>
<td>Commercial through 2008Q4</td>
<td>11%</td>
<td>12%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Source: Federal Reserve Flow of Funds and the Graaskamp Center
Multifamily debt is growing at an unsustainable pace (maybe)...

<table>
<thead>
<tr>
<th>Period</th>
<th>3-Year</th>
<th>5-Year</th>
<th>10-Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multifamily through 2019Q1</td>
<td>9%</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>Multifamily through 2009Q4</td>
<td>8%</td>
<td>8%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Source: Federal Reserve Flow of Funds and the Graaskamp Center.
Delinquency rates are at or near 20-year lows for all but CMBS.

Source: Mortgage Bankers Association, Commercial/Multifamily Databook 2018Q3.
leveraged loan lenders are pushing traditional real estate lenders...
late cycle, covenant lite, corporate lending is the norm in leveraged loan underwriting . . .
real estate debt funds are pushing bank debt underwriting.
The 2020 Forecast

Asset prices:
- Cap rates will widen out by 25 bp to account for new risk premiums

Equity capital:
- Transaction volumes will fall by 5% over economic and pricing concerns

Debt capital markets:
- Will begin to tighten as the Fed clamps down on leveraged loan banks

GDP growth:
- 2.0% YOY and falling to 1.0%

Wage inflation concerns will keep interest rates from falling, weak economy as an offset
- 10-year UST at about 1.80-2.00% this time next year
Real Estate

Condominium
Rate
Residential
Development
Investing
House
Property
Profit
Marketing
Broker
Mortgage
Agent
Building
Rent
Interest
Insurance
Market
Sold
Contract
Purchase
Finance
Investment
Acquisition
Ownership
Business
Negotiate
Loan
Buyer
Owner
Seller
Tax
Acquisition
Commission
Legal
Corporate
Fence
Agency
Corporate
Management
Commercial
Location
Apartment
Residential and non-residential construction is shrinking . . . . supply is in check . . . .
. . . . industrial trends, transaction volume is up 63% YOY . . . .

Opinion of Current Industrial Pricing

<table>
<thead>
<tr>
<th>Category</th>
<th>Overpriced</th>
<th>Fairly priced</th>
<th>Underpriced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>26.0%</td>
<td>66.7%</td>
<td>7.3%</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>27.0%</td>
<td>65.1%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Flex</td>
<td>27.5%</td>
<td>64.1%</td>
<td>8.5%</td>
</tr>
<tr>
<td>Warehouse</td>
<td>45.6%</td>
<td>52.5%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Fulfillment</td>
<td>46.4%</td>
<td>47.7%</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

Source: ULI, Emerging Trends in Real Estate 2020, survey.
Office trends, transaction volume is off 7% YOY.

Opinion of Current Office Pricing

<table>
<thead>
<tr>
<th></th>
<th>Overpriced</th>
<th>Fairly priced</th>
<th>Underpriced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical office</td>
<td>24.6%</td>
<td>69.3%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Suburban office</td>
<td>30.0</td>
<td>55.8</td>
<td>14.1%</td>
</tr>
<tr>
<td>Central-city office</td>
<td>50.3%</td>
<td>44.1%</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

... retail trends, transaction volume has plummeted 55% YOY...

. . . . retail pricing perceptions. . . .

### Opinion of Current Retail Pricing

<table>
<thead>
<tr>
<th>Type of Retail</th>
<th>Overpriced</th>
<th>Fairly priced</th>
<th>Underpriced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neighborhood/community shopping centers</td>
<td>26.0%</td>
<td>64.6%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Lifestyle/entertainment centers</td>
<td>34.5%</td>
<td>57.3%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Outlet centers</td>
<td>39.0%</td>
<td>57.0%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Power centers</td>
<td>39.4%</td>
<td>50.3%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Regional malls</td>
<td>45.3%</td>
<td>43.0%</td>
<td>11.6%</td>
</tr>
<tr>
<td>Urban/high-street retail</td>
<td>47.5%</td>
<td>46.4%</td>
<td>6.1%</td>
</tr>
</tbody>
</table>

. . . . apartment trends, transaction volume is off 7% YOY. . . .

apartment pricing perceptions, We are building 90 percent of our housing for 10 percent of our households.”

**Opinion of Current Apartment Pricing**

<table>
<thead>
<tr>
<th>Category</th>
<th>Overpriced</th>
<th>Fairly priced</th>
<th>Underpriced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower-income apartments</td>
<td>18.9%</td>
<td>72.7%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Senior housing</td>
<td>25.6%</td>
<td>67.3%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Moderate-income apartments</td>
<td>29.0%</td>
<td>63.9%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Single-family rental</td>
<td>30.1%</td>
<td>66.6%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Student housing</td>
<td>40.6%</td>
<td>56.6%</td>
<td>2.8%</td>
</tr>
<tr>
<td>High-income apartments</td>
<td>68.7%</td>
<td>28.2%</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

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WHERE ARE WE HEADED?