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Multifamily Research Perspectives

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Steve Guggenmos | 571-382-3520
Harut Hovsepyan | 571-382-3143
Sara Hoffmann | 571-382-5916

# Oil Price Impacts and Multifamily Housing

- As oil prices fall and are expected to remain low, energy-dependent areas are at risk of an economic slowdown and impacts to their multifamily markets.
- Smaller metropolitan areas will likely experience a more severe economic impact, whereas larger metro areas are more diversified and can better absorb the potential losses.
- Houston is the largest metro with risk exposure; while the oil price drop will have an impact on the multifamily sector there, it will not be as severe as during the energy crash of the 1980s.
- The broader economy is expected to benefit from lower oil prices over the next few years.

*The broader economy is expected to benefit from the lower oil prices, but areas that are heavily energy-dependent are at risk of economic slowdown or downturn.*

The recent drop in oil prices has raised concerns about the economies of energy-dependent areas across the country, especially as many market watchers forecast prices to remain low through the end of the year. The last energy bust in the 1980s severely impacted the economies of the "oil patch" region, causing several areas to fall into recession. With oil prices down by more than 50 percent since November 2014, the risk that these regions might fall into recession has become real once again. The risk largely resides in smaller, less-diversified economies of the oil patch region, but a few larger metropolitan areas with a heavy dependency on oil-related industries could also be impacted. However, the broader economy is expected to benefit from the lower oil prices because household savings on gasoline consumption and reduced operating costs in many industries are expected to surpass the losses in the oil industry.

In the most exposed areas, labor markets could be impacted significantly, which could lead to imbalance between supply and demand in the housing market. This is

the case in both large and small markets, but the imbalance for the apartment market is likely to occur in the larger metropolitan areas due to their larger inventory of multifamily stock. Even though the economies in the smaller metropolitan areas are at greater risk of an economic slump, they traditionally do not have as much multifamily stock. Therefore, the risk to the multifamily industry comes from the larger metropolitan areas.

Houston is the largest metro that could experience greater risk exposure to its multifamily sector due to the heavy concentration of energy-dependent jobs along with its recent multifamily construction boom. We run a stress scenario to determine the impact a negative market shock could have on the Houston multifamily rental market. We conclude that Houston as a whole likely will not reach the level of stress experienced in the early 1980s if oil prices remain low.

## Section 1 – Risk Exposure

We start by identifying markets considered to have higher potential risk exposure due to their dependency on the energy sector. Our analysis measures exposure using multiple factors, including oil production level, rig count, job concentration in oil- and gas-related industries, market industrial diversification, and recent multifamily housing starts. We conclude that smaller, oil-dependent areas will see the largest impact on jobs and the local economy, while larger areas can better absorb potential job losses but have a higher inventory of multifamily stock that could be affected.

### *U.S. Oil Production*

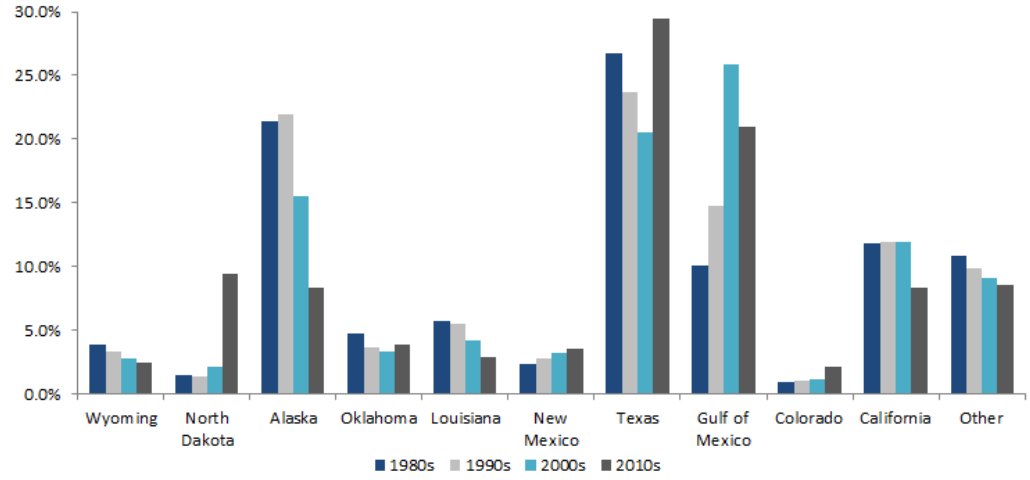
*U.S. oil production has increased substantially across many of the oil-producing areas, but most notably in North Dakota and Texas, during the past few years.*

Since the early 2000s, oil prices have generally been increasing (though there was a period of significant decline when the broader economy was weak during the Great Recession) and, until recently, remained elevated around $80-100 per barrel since 2010. This opened up opportunities for many energy companies to expand production. With improvements in the technology to extract oil from more difficult-to-drill places, the production of oil in the United States has increased from 170 million barrels per month in 2011 to 289 million barrels as of December 2014, a 70 percent increase. Although this is not the historical peak, the growth rate in production over the past three years has been much steeper than any previous three-year period since the 1950s, growing on average 15 percent per year.[1] The growth in production has driven economic growth in the areas where oil production and related industries make up a dominant sector of the local economy.

[1] Production of U.S. oil peaked in October 1970 at 310 million barrels per month. Production then gradually declined, but peaked again in January 1986, at 283 million barrels. After that, the production of U.S. oil trended down, bottoming at 119 million barrels in September 2008.

While oil production in the United States is concentrated in several regions, the growth pattern in each of these regions has varied over time. Exhibit 1 shows how the share of U.S. oil production has changed since 1980. North Dakota is now the third largest producer of oil in the United States as production increased by 400 percent in the 2010s, relative to average production a decade earlier. Meanwhile, levels as well as the share of production in several other key areas have remained flat or fallen over the past few years, including Louisiana and Alaska.

Exhibit 1 – Share of Oil Production in the United States by Decade[2]




Source: U.S. Energy Information Administration (EIA), Freddie Mac
Note: The majority of the wells in the Gulf of Mexico are off the coast of Louisiana, but production is shared with Texas and Alabama

### *Higher-risk States*

While the oil production and related industries are capital intensive, they also employ a large number of employees. As such, swings in oil production positively or adversely affect the labor market and overall economic well-being of areas that depend heavily on the oil industry. Accordingly, we look at the concentration of jobs in oil and gas production and related industries to assess which markets are at higher risk. We also look at oil and gas rig counts in each of these markets. Changes in rig counts can inform future production levels. The number of active rigs in the United States has dramatically declined since the sharp drop in oil prices. The drop can impact the current labor market, and also suggests supply will fall in the mid-term to firm up oil prices.

Exhibit 2 captures geographic exposure to the energy sector by presenting the oil and gas job concentration together with the share of rigs in the United States

[2] While the combined share of production in states included in the "Other" group is high, share of individual states ranges from nearly 0 to 1.8 percent.

(including land and off-shore rigs) and changes in the number of rigs over the past few months. While many job categories are somewhat tied to oil and gas production, we focus on the categories that are at higher potential risk: Oil and gas extraction, drilling of oil and gas wells, support activities[3], and petroleum refineries. The share of such jobs is more than 5 percent of total employment in Wyoming, North Dakota, and Alaska, putting those areas at higher risk. Meanwhile, total rig count across the United States dropped from 1,925 in October 2014 to 885 in May 2015 (as of May 22), a 54 percent reduction. Rig counts declined in all regions except Alaska, with some states experiencing nearly a 50 percent reduction. This is likely evidence that low oil prices are having a negative impact on drilling activities, which in turn will affect future production and job growth.

*Wyoming, North Dakota and Alaska have the highest concentrations of oil- and gas-related jobs, but Texas operates the most oil rigs.*

In fact, the labor market has already started to feel the effects of the low oil prices. According to Challenger, Gray & Christmas, Inc., job cuts announced in first quarter 2015 were up 16 percent, to 140,000, compared to first quarter 2014. Of these cuts, 34 percent were directly related to falling oil prices. Furthermore, the majority of these cuts were in the energy sector, at 38,000, and Texas reported the largest number of overall job cuts at 47,000. While the pace of energy job cuts slowed in March compared to January and February, cuts in industrial goods picked up in March as manufactures are adjusting their payrolls accordingly.

## Exhibit 2 – Oil and Gas Job Concentration, Oil Rig Count and Recent Drop in Oil Rigs

| State | Oil & Gas Job Concentration (State) | Percentage of Rig Count to Total U.S. Rigs* | Total Rigs as of October 2014 | Drop in Rig Count Since October 2014** |
|---|---|---|---|---|
| Wyoming | 8.4% | 2.5% | 61 | -39 |
| North Dakota | 7.2% | 8.8% | 182 | -104 |
| Alaska | 5.6% | 1.0% | 8 | 1 |
| Oklahoma | 4.7% | 11.8% | 208 | -104 |
| Louisiana | 3.7% | 7.8% | 111 | -42 |
| New Mexico | 3.6% | 5.3% | 100 | -53 |
| Texas | 3.2% | 42.1% | 899 | -526 |
| Colorado | 1.4% | 4.4% | 76 | -37 |
| West Virginia | 1.3% | 2.0% | 33 | -15 |
| Montana | 1.3% | 0.0% | 11 | -11 |
| California | 0.3% | 1.5% | 45 | -32 |
| Subtotal | 0.5% | 87% | 1736 | -964 |
| United States | 0.6% | 100% | 1925 | -1040 |

Source: Bureau of Labor Statistics, Baker Hughes, Freddie Mac
*As of May 22, 2015
**As of May 22, 2015, compared to the month average for October 2014

[3] Support activities include jobs in support of the oil- and gas-extraction process that can be performed on a contract or fee basis or by mining operators' in-house staff.

### *Higher-risk Metros*

*Smaller MSAs with a high dependence on oil and gas jobs are exposed to the most risk due to less diversified economies.*

Next, we narrow down the analyses by MSA (Metropolitan Statistical Area). Metros around the oil patch regions are typically smaller. However, several larger MSAs have a relatively high concentration of oil and gas jobs. Exhibit 3 lists the metros with a relatively high concentration of oil and gas jobs and their industrial diversification indexes. The industrial diversification index, measured by Moody's Analytics, shows how closely the area's economy resembles the diversification of the entire U.S. economy. The closer to one, the better diversified; the closer to zero, the less diversified. The exhibit contrasts larger metros with smaller ones. Notably, smaller metros generally have a higher concentration of oil- and gas-related jobs. Furthermore, oil- and gas-related job industries are the dominant driver of the local economies in these metros, as evidenced by the lower industrial diversification values. As such, smaller metros possess higher risk that the local economy will not be able to fully absorb the job losses in the event of layoffs in the oil and gas industries. Of these, the highest risk is in Midland and Odessa, both located within the Permian Basin in Texas. These metros have the largest concentration of oil and gas jobs -- 15.7 and 12.3 percent, respectively -- and very low industrial diversification index ratings, 0.08 and 0.14, respectively.

Unlike in smaller MSAs, the share of oil and gas jobs in larger metros is relatively small, and these metros generally are more diversified. However, the absolute number of oil and gas jobs in these metros is far greater than in smaller metros. For example, Houston, the epicenter of the oil and gas industry, houses almost 50 percent of all oil and gas jobs in Texas; however, these jobs compose just 4.8 percent of the metro's total employment. Houston's industrial diversity index is 0.59, which is the same as Los Angeles and New York City, an indication that the employmnet market is well diversified. As such, the metro will be able to withstand oil- and gas-related downturns more effectively than many of the smaller metros. But compared to other larger metros, Houston possesses the highest potential risk. Oklahoma City, for example, with a 4.2 percent share of oil and gas jobs, has a higher diversity index of 0.70. Other larger metros have a much lower share of jobs in oil and gas industries and higher diversification values.

Exhibit 3 – Oil and Gas Concentration and Industrial Diversification Index by MSA

| Metro Area | Oil & Gas Job Concentration | Industrial Diversification Index | Metro Area | Oil & Gas Job Concentration | Industrial Diversification Index |
|---|---|---|---|---|---|
| *Larger MSAs* | | | *Smaller MSAs* | | |
| Houston, TX | 4.8% | 0.59 | Midland, TX | 15.7% | 0.08 |
| Oklahoma City, OK | 4.2% | 0.70 | Odessa, TX | 12.3% | 0.14 |
| New Orleans, LA | 2.5% | 0.61 | Casper, WY | 11.0% | 0.25 |
| Tulsa, OK | 1.9% | 0.62 | Lafayette, LA | 9.8% | 0.20 |
| Dallas, TX | 1.1% | 0.80 | Greeley, CO | 8.8% | 0.37 |
| Denver, CO | 1.0% | 0.80 | Farmington, NM | 7.9% | 0.21 |
| San Antonio, TX | 0.9% | 0.81 | Houma, LA | 6.7% | 0.07 |
| Austin, TX | 0.4% | 0.67 | Grand Junction, CO | 5.6% | 0.48 |
| **United States** | **0.6%** | **1.00** | | | |

Source: U.S. Bureau of Labor Statistics, Moody's Analytics, Freddie Mac

It is important to note that not all of the oil patch regions are part of an MSA. This limits the ability to narrow in on where to assess the greatest risk exposure in these regions. Many of the oil fields in states such as Wyoming and North Dakota are sparsely populated and very few or no MSAs in those states show up in the risk analysis. We expect any such market to have a very high concentration of jobs in oil and gas industries and very low economic diversification.

### *What Others See*

To fully understand the potential impacts to the U.S. economy, a large-scale structural model could be used to capture the direct and indirect effects of specific scenarios. Moody's Analytics developed such a model, which captures the interactions between economic, financial, and demographic drivers in the economy. Given this tool, Moody's Analytics created a low-oil-price scenario. This scenario assumes oil will stay around $60 per barrel until the end of 2017, compared to its baseline scenario that assumes oil prices will increase steadily over the next three years to above $100 by the end of 2017.

*Even if oil prices remain low for the next three years, Moody's Analytics predicts national employment growth will not be significantly impacted and may even improve.*

In general, the Moody's forecasts are intuitive. National employment growth is expected to remain consistent between the low-oil-price and baseline scenarios in the short run, around 2.5 percent. But over the next three years, the employment growth forecast in the low-oil-price scenario is stronger than in the baseline scenario because of the cost-savings boost in oil-consuming industries.

Many energy-dependent areas, both states and metros, are expected to see an impact on job growth over the next few years compared to the baseline scenario. The larger, more diversified metros are likely to absorb some of the job losses from the oil and gas industries and experience a slowdown in employment. However, in smaller metros where the job market is less diversified and the share of oil and gas jobs is

high, total employment is expected to decrease under the low-oil-price scenario. The impact is expected to be worst in 2015 before employment turns the corner in 2016 and 2017.

### *Impact on the Multifamily Rental Housing Sector*

Housing preferences vary greatly among these areas; smaller areas are more single-family oriented, while larger MSAs have a greater concentration of multifamily properties. Nonetheless, several smaller areas have seen a spike in multifamily and single-family construction in recent years due to the large influx of workers.

Multifamily construction has been accelerating from historically low levels in most metros in the post-recession years. Nationwide, multifamily construction starts ended 2014 at 341,000 units, about 50,000 units higher than the annual long-run average from 1995-2007. The growth is largely driven by the strengthening economy and lagging single-family market. However, the energy boom has spurred even higher growth in many of the areas with high concentration of oil and gas jobs. Exhibit 4 shows the percentage of multifamily housing starts in 2014 compared to the historical average in some of these states and MSAs. North Dakota and Houston have seen a significant rise in multifamily housing construction over the last few years to accommodate the rise in employment. If employment slows over the next few years and the amount of building exceeds the demand, multifamily fundamentals could be strained. The effects are not expected to be as severe in the other states and MSAs, but lower employment growth over the next year could lessen multifamily performance expectations in some submarkets. However, while the multifamily sector in smaller areas is at risk as well, these areas contain much less multifamily housing stock than in relatively larger MSAs.

*Areas with a recent increase in multifamily supply are at higher risk of experiencing unfavorable multifamily fundamentals.*

Exhibit 4 – Multifamily Starts in 2014 Compared to Historical Average by State and MSA

| State | Multifamily Starts in 2014 Compared to Historical Average* | MSA | Multifamily Starts in 2014 Compared to Historical Average* |
|---|---|---|---|
| Wyoming | 16% | Houston | 90% |
| North Dakota | 495% | Oklahoma City | 37% |
| Alaska | -52% | New Orleans | -42% |
| Oklahoma | 37% | Tulsa | 77% |
| Louisiana | -18% | Dallas | 38% |
| New Mexico | -21% | Denver | 21% |
| Texas | 67% | San Antonio | -36% |
| Colorado | 15% | Austin | 49% |
| California | 26% | United States | 7% |

*Historical average calculated as the average starts from 1995-2007
Source: U.S. Census Bureau, Moody's Analytics, Freddie Mac

## Section 2 – Stress Scenario: Houston

Persistently low oil prices will have an impact on highly exposed markets. Our analysis focuses on the Houston market because of its relatively heavy dependence on the energy sector and recent boom in multifamily construction, as discussed in the prior section. While today's economy is different than in the 1980s, measuring the potential impact low oil prices have on the market is desirable. We create a stress scenario to better understand current conditions in the Houston market and how that compares to intense strain on the market. In our stress scenario, we determine what level of impact is needed to create a negative shock in the Houston economy and evaluate its effects on the multifamily market. We find that several factors in the analysis contrast current market conditions, and conclude that the market is not on the edge of a precipitous decline.

### *Impact of the 1980s Oil Crash*

While Houston's multifamily sector has been through several booms and busts in the past, the energy bust of the 1980s was the most severe. Prior to the sharp decline in oil prices in the early 1980s, Houston's economy was thriving. The unemployment rate was 4.1 percent, more than 2.5 percentage points below the U.S. average, and employment had been growing on average 7.5 percent per year, compared to 2.6 percent nationally. Because the market was attracting many workers, Houston was the fastest growing major MSA, with 4.6 percent population growth per year on average compared to 1 percent nationally. Both single-family and multifamily sectors benefitted from the growing demand; construction in both housing segments boomed, further fueling the market growth. The growing demand produced accelerated rent growth.

After this exuberant period of growth, oil prices began to fall in 1981. Prices dropped from $115/barrel in April 1980 to $64/barrel in November 1985, but then dropped drastically and quickly, hitting $26/barrel by February 1986. While the oil production and associated industries felt the pain first, the spillover effects also impacted other sectors of the market. The effect was devastating. The total labor market shrank by 1.7 percent annually; the unemployment rate more than doubled, reaching 11 percent; and population growth significantly slowed to nearly 0.5 percent annually.

The deteriorating fundamentals also took a toll on the housing market. Single-family house price declined by 25 percent from peak to trough, while construction plummeted by 80 percent. Multifamily construction was almost completely halted; vacancy rates sharply rose, reaching 18 percent; and rents declined for four straight years, dropping 14 percent in total.

### *The Energy and Multifamily Sectors in the 1980s*

While the extremely strong local economy drove multifamily construction in Houston leading into the last oil price-induced stress, it also coincided with a boom and bust in the multifamily sector across the nation. The entire U.S. multifamily sector grew tremendously in late 1970s to mid-1980s, largely driven by the tax shelter that many investors benefitted from by investing in multifamily properties. In fact, investors moved capital into commercial real estate when oil prices began to fall in an effort to maintain high returns on invested capital. The heavy investment in commercial real estate at the time stimulated multifamily construction across the nation. Multifamily starts with five or more units peaked in 1985 at 577,000 units, from around 300,000 in the early 1980s.

In comparison, while multifamily starts have been on the rise in the past few years, they have just surpassed 300,000 in 2014 after remaining significantly below the long-run average of 295,000 from 2009 to 2012. Therefore, the multifamily construction boom since the Great Recession is still nowhere near the boom seen in the mid-1980s.

*The energy crash of the 1980s also coincided with a crash in the multifamily sector. Multifamily markets enter this potential stress much more balanced today.*

The shocks of the low oil prices and oversupply of multifamily construction in the 1980s hit markets hard in areas heavily dependent on the oil and gas industries, such as Houston, Austin, and Dallas. Deteriorations in labor markets and property markets resonated into fundamentals of the multifamily market, leading to loan defaults. Losses in commercial lending for investments in the energy sector devastated southwest regional capital markets. From 1980 through 1989, 425 Texas commercial banks failed, including nine out of the state's 10 largest bank holding companies. The collapse of the capital markets resulted in the meltdown of the entire multifamily sector. While it is difficult to isolate the net effect that oil prices had on the capital markets, it is clear that the combination of many factors made it much worse for energy-dependent areas.

### *More Diversified Economy and Relatively Low Supply*

The labor markets of today are different than they were in the 1980s. According to the Bureau of Labor Statistics' Current Employment Statistics program, education and health services, professional and business services, and leisure and hospitality sectors are increasingly becoming major industries in Houston. The combined share of employment in these sectors has increased from 28.5 percent in 1990 (the earliest date available) to 37.4 percent in 2014. As mentioned earlier, Moody's Analytics' diversity index also shows that Houston economy is relatively diversified, and is more so now than it was in the 1980s; an index of 0.59 today compared to 0.51 in 1983. Better diversification will help Houston weather shocks in the energy sector.

Furthermore, the supply of new multifamily units while high is not nearly as elevated as it was in 1980s. The ratio of new construction starts relative to existing inventory in the 1980s and now shows a dramatic difference. Multifamily starts in 1982 and 1983 comprised 15 percent of the existing multifamily inventory, in aggregate. The share of starts in 2013 and 2014 comprised only 5 percent, in aggregate. Moreover, a recent decline in multifamily permits is an indication of slowing multifamily construction.

### *Stress Scenario*

According to Moody's Analytics' baseline scenario employment forecast, Houston's labor market is likely to continue to expand at an average rate of 2.4 percent annually for the next three years. However, in the low-oil-price scenario, employment growth is likely to slow to 2.2 percent on average per year. The labor market impact will be most substantial in 2015 when the stress scenario projects near zero growth; faster growth is expected in consecutive years. It is expected that the job gains in other sectors as a consequence of low oil prices will help offset the jobs lost in the energy sector.

*Moody's low-oil-price scenario anticipates flat employment growth in Houston in 2015; growth in other sectors will help offset the energy sector job losses.*

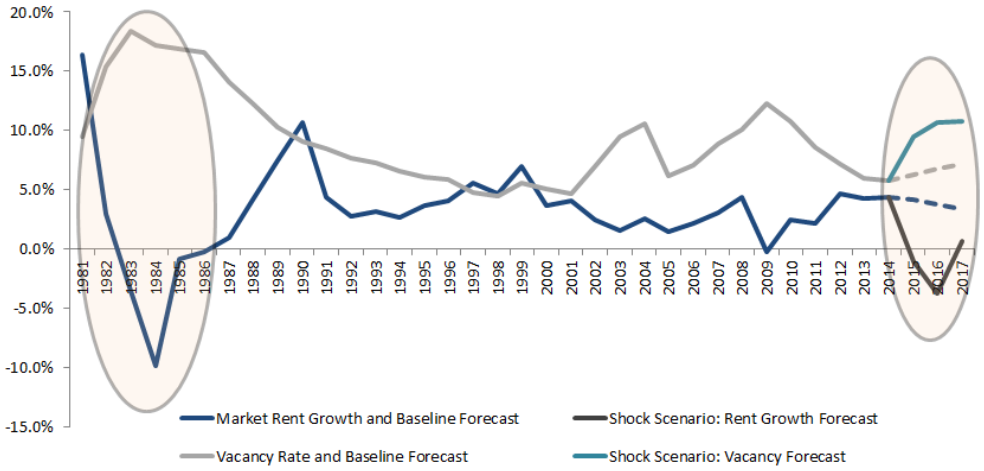
Based on these forecasts, multifamily fundamentals are likely to slow in the short-term, but will not have a major, long-lasting, metro-wide impact. Nevertheless, we consider multiple scenarios for the factors affecting the multifamily market. We use our internal market forecast model to assess the impact of these paths on Houston's rent growth and vacancy rate. The model includes functionality that considers historical market "turning points". Building scenarios consistent with previously identified conditions driving these dramatic changes in the market can inform us about current conditions. Shocks are likely to occur when major disruptions take place in the supply side, demand side, or both. For example, a turning point occurred in the 1980s when demand quickly fell and the large amount of new supply entered the market, exacerbating the market collapse.

Our baseline scenario is in line with Moody's Analytics' baseline scenario; it assumes that Houston employment will continue to grow at moderate levels, albeit a slower rate than in the past few years. It also assumes that multifamily construction will gradually slow. Rent growth is expected to gradually slow and vacancy rates to inch up to 7.2 percent. Even when we include the path with employment growth and multifamily starts based on Moody's low-oil-price scenario, there was little impact to our forecast of multifamily fundamentals.

However, we implement a stress path scenario to force the Houston market to experience a turning point. This scenario assumes that employment will decline 4 percent and that multifamily construction will keep increasing to near 40,000 units annually. These extreme conditions are not forecast to occur, making it unlikely the

market will shift as projected. Vacancy rates in this scenario will spike up to 10 percent by 2016 and remain flat in 2017, while rents will decline 1.1 percent in 2015 and continue to slide another 3.7 percent in 2016 before turning positive again in 2017. It is imperative to note that the probability of such a scenario is very low because, as explained earlier, the growth in employment is likely to slow down, not turn negative, and multifamily development is likely to decline instead of increase. As shown in Exhibit 5, the effect of such a shock is more like that of the Great Recession than of the energy crisis of 1980s.

Exhibit 5 – Houston Historical and Projected Vacancy Rates and Market Rent Growth




Source: REIS, Freddie Mac

## Conclusion

Low oil prices likely will be a net benefit to the overall economy, although smaller markets with a high dependency on energy-related jobs are expected to be negatively impacted. A few larger metros with a significant concentration of energy jobs could see an impact to their economies and multifamily performance over the next few years. However, in these larger areas the severity of the downturn will be less and the market will rebound more quickly.

In Houston, even if oil prices remain depressed for three years, the shock to the economy and labor market will not be as stressful as the one experienced in the 1980s. Furthermore, in order to shock the Houston economy so that multifamily fundamentals are impacted severely, the drop in employment would have to be consistent with that of the Great Recession and multifamily starts concurrently would have to increase significantly. Even then, the impact in this type of scenario does not produce the severity of the 1980s oil price shock.

Instead, current expectations are that employment growth will slow and multifamily construction will follow suit. Some areas in Houston will be impacted, especially those where new multifamily deliveries are still in lease-up. But with employment growth expected to rebound in 2016 and beyond, impacts to the rental market are not expected to be severe. However, smaller, less diversified markets with heavy ties to the energy sector may experience more severe impacts to their economy and housing markets.

*For more insights from the Freddie Mac Multifamily Research team, visit the Research page on FreddieMac.com/Multifamily.*