FINANCIAL INTELLIGENCE *from* FHLBank Topeka

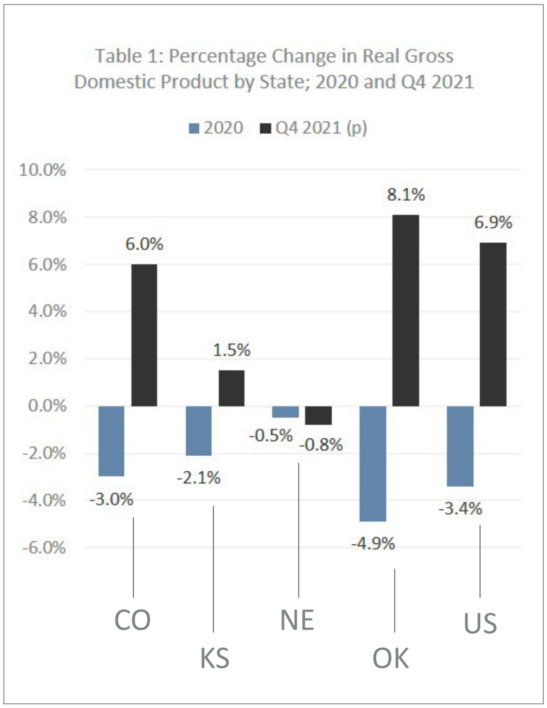
Tenth District Economic Update

Quarterly Report / Q4 2021

Prepared by: Corporate Strategies and Solutions

Data as of Tuesday, April 12, 2022 — See footnotes for source and data release information

Fourth Quarter Economic Growth



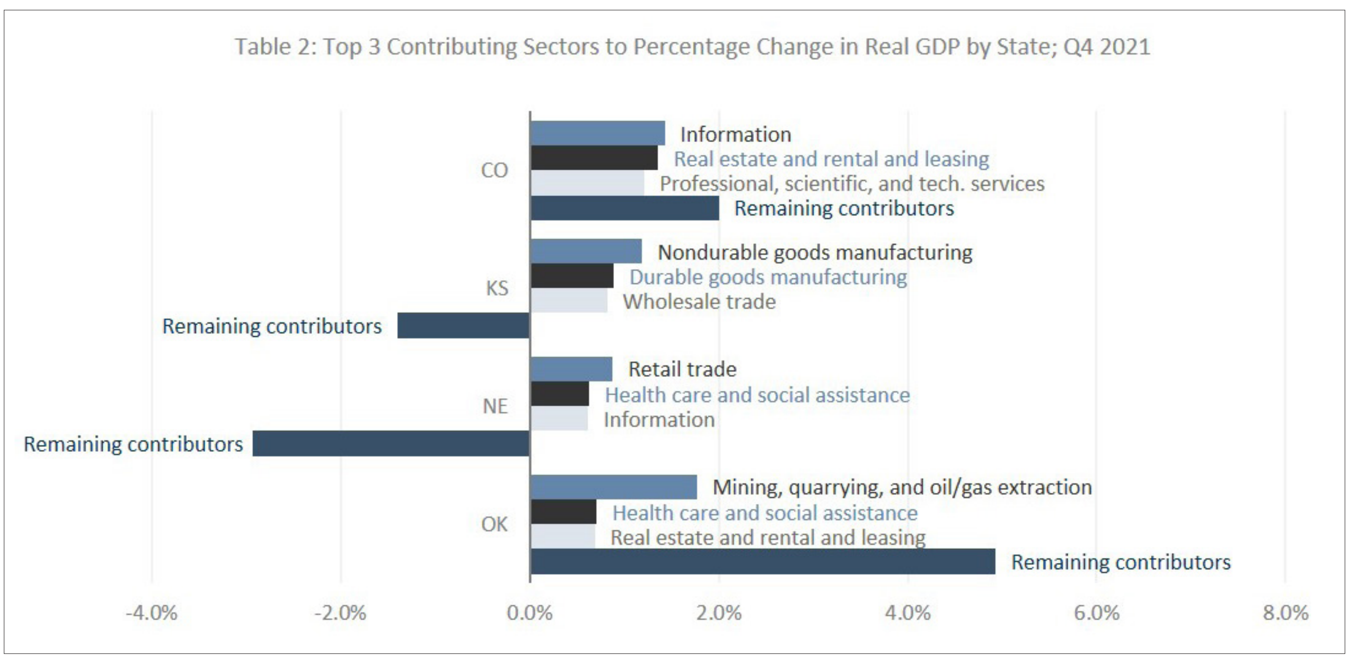
Tenth District includes Colorado, Kansas, Nebraska and Oklahoma

After a tumultuous 2020, preliminary Real Growth Domestic Product (GDP) looks to close out 2021 with a major rebound. On average, Tenth District (District)* states have fared slightly worse than the rest of the U.S.

Despite the drag of COVID-19 on the travel industry, Colorado has proven most resilient among District states. Housing, construction and population growth continues to boom, while tech and information-driven industries have kept Colorado afloat. Colorado's 6% GDP growth was 26th among U.S. states in the fourth quarter 2021.

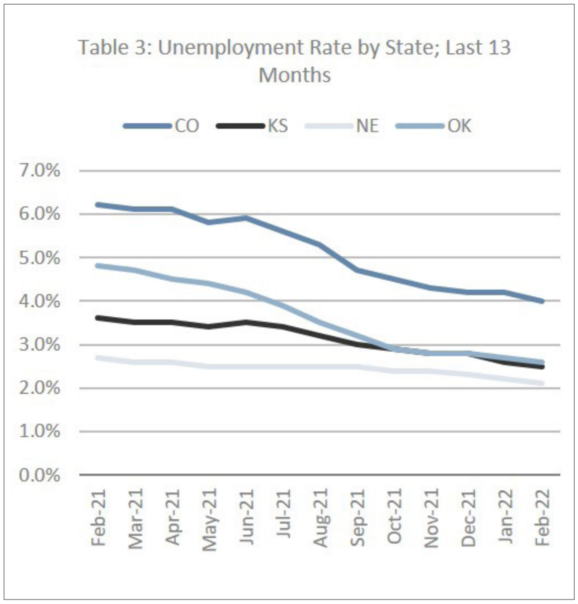
Until fourth quarter 2021, the agricultural and manufacturing-focused states of Kansas and Nebraska generally managed more favorably than the rest of the country during 2021's recovery. However, weakness in agriculture, forestry, fishing and hunting served as a major drag to the "Plains," dropping Kansas and Nebraska's real GDP growth by 4% and 5.6%, respectively.

Oklahoma derives much of its growth potential from the energy sector. Typically, as the oil and gas industry improves, so too does Oklahoma. After curbed energy demand resulting from hamstrung commercial and personal transportation in 2020, Oklahoma has rebounded, posting its third straight quarter of positive growth and finishing the year with 8.1% annualized growth in the fourth quarter 2021.



Source: U.S. Bureau of Economic Analysis (BEA) – Gross Domestic Product by State, Fourth Quarter 2021and Year 2021 [preliminary]
Next Release: June 30, 2022 – Gross Domestic Product by State (Q1 2022)

Employment & Labor

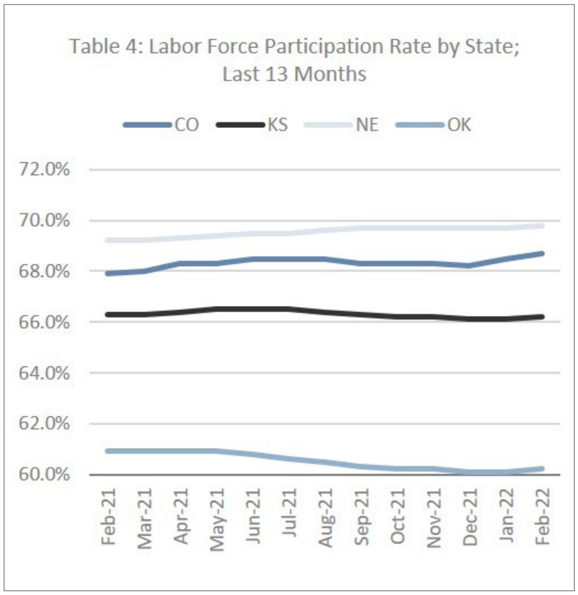


Colorado, typically boasting one of the District's lowest unemployment rates, continues to trend at the top in the aftermath of COVID. At 4%, its unemployment rate is down 2.2% year-over-year (YoY) and 0.2% year-to-date (YTD) but ranks just 28th among U.S. states.

Kansas and Nebraska have fared better than their national peers in terms of unemployment. Kansas ranks fourth in the U.S. at 2.5%, down 1.1% YoY and 0.1 % YTD. With 2.1 percent unemployment, Nebraska is down 0.6% YoY and 0.1% YTD. Nebraska is tops in the U.S. for the lowest unemployment rate, tied with Utah and ahead of third place Indiana by 0.2%.

Given the recent strength in the energy sector, Oklahoma has improved their unemployment rate, down to 2.6% in February 2022. On a YoY basis, Oklahoma's unemployment rate is down 2.2%.

All but Colorado are below the national average of 3.8% (as of February 2022).



In terms of labor force participation rate (LFP), Colorado has surprisingly seen the greatest increase in the District over the past year. At 68.7% in February 2022, Colorado is up 0.8% YoY and 0.2% YTD.

Though remaining strong on a national basis, Kansas has seen negative growth in LFP over the past year, down 0.1% to 66.2%. Kansas currently ranks third in the District but ninth in the U.S.

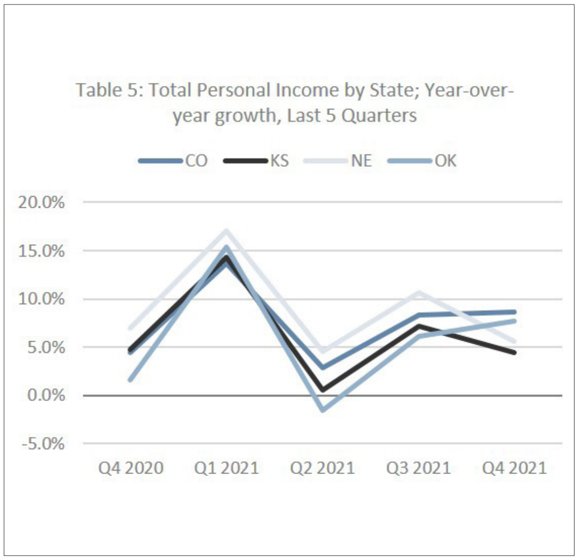
Nebraska's prowess in labor conditions is also reflected in a strong participation rate. Up 0.6% YoY, Nebraska is first in both the District and the U.S. at 69.8%.

Down 0.7% YoY, Oklahoma continues to trail the rest of the District by a wide margin at 60.2%.

The nationwide rate in February 2022 was 62.3% (up 0.8% YoY and 0.1% YTD).

Source: U.S. Bureau of Labor Statistics (BLS) – Civilian Noninstitutional Population and Associated Rate and Ratio Measures for Model-Based Areas, February 2022
Next Release: April 15, 2022 – State Employment and Unemployment (March 2022 data)

Wage Measures



Total personal income is defined by the U.S. Bureau of Economic Analysis (BEA) as the income received from wages, proprietors' income, dividends, interest, rents and government benefits.

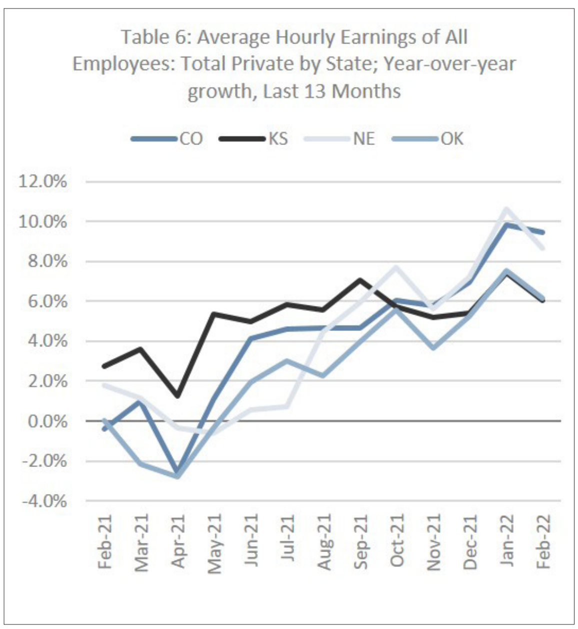
Given recent trends in inflation, any personal income growth less than the rise in the cost of goods would be problematic for the workers in that state.

Fortunately for the District, all four states have continued to trend at or near that threshold for three of the last five quarters.

But recent trends are concerning with skyrocketing inflation and flat to negative personal income growth in 4Q 2021.

Two of the four states in the District are down compared to one year ago with Kansas dropping from 4.8% growth in Q4 2020 to 4.5% growth in 2021. Nebraska is also down from 7% to 5.6%. Colorado and Oklahoma saw income growth up YoY with improvements of 4.1% and 6.1%.

YoY personal income growth for the U.S. was 7.2%.



Average hourly earnings (AHE), as defined by the U.S. Bureau of Labor Statistics (BLS), reflect not only changes in basic hourly and incentive wage rates but also such variable factors as premium pay for overtime, late-shift work and changes in output of workers paid on an incentive plan. They also reflect shifts in the number of employees between relatively high-paid and low-paid work and changes in workers' earnings in individual establishments.

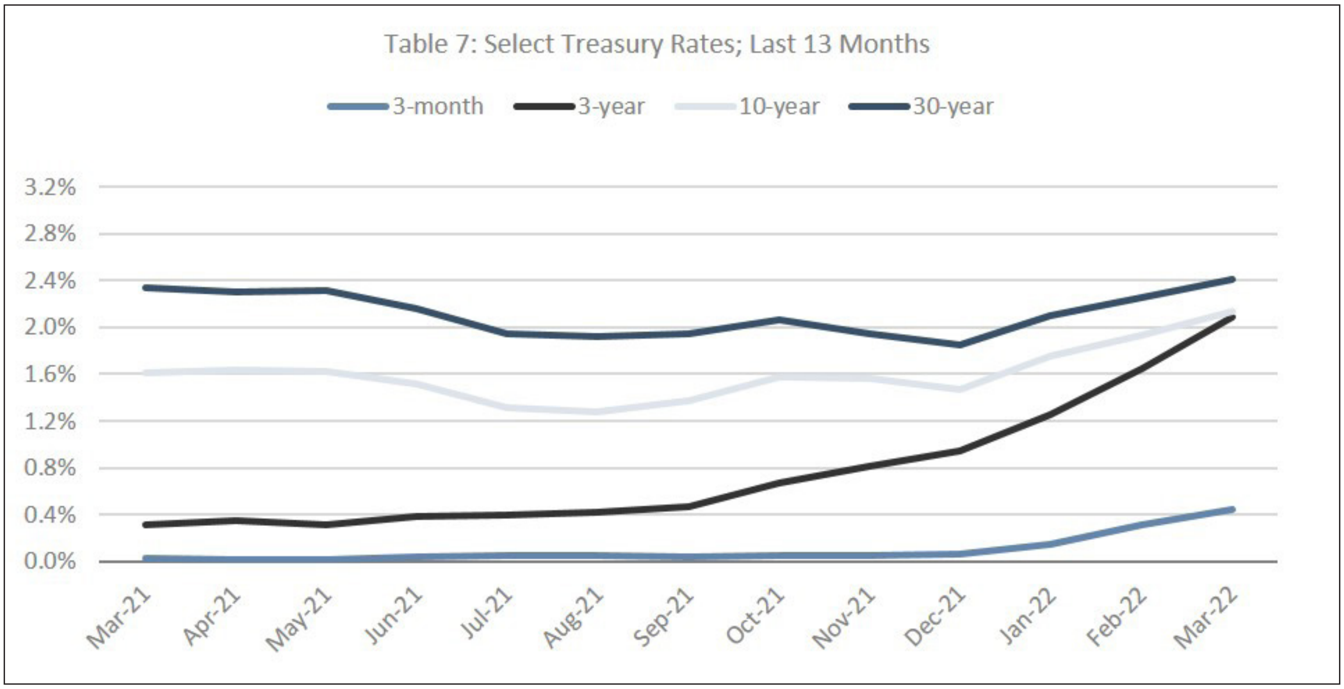
Earnings differ from wage rates in that earnings are the actual return to the worker for a stated period while wage rates are the amount stipulated for a given unit of work or time. Earnings do not measure the level of total labor costs on the part of the employer as benefits, irregular bonuses, retroactive items and payroll taxes paid by employers are excluded.

Again, understanding that above-inflation earnings growth is vital to maintaining purchasing power, AHE staying in line with inflationary measures is paramount for workers. Though it has been a bit of a bumpy ride, all District states have annual growth above 6% with Colorado highest at 9.5%. Nebraska follows at 8.6% with Kansas and Oklahoma close together at 6% and 6.2%, respectively. All but Kansas have improved their annual growth figures by more than 6% YoY (Kansas is up 3.3% compared to February 2021).

The YoY growth rate for U.S. AHE in February 2022 was 5.2%.

Sources: U.S. Bureau of Economic Analysis (Personal Income) and U.S. Bureau of Labor Statistics (Average Hourly Earnings)
Next Releases: April 22, 2022 (Personal Income); April 15, 2022 (Average Hourly Earnings)

Interest Rates and FOMC Policy



Following the longest expansion in U.S. history (10 years, eight months), the recession resulting from COVID-19 lasted about four months during which Treasury rates dropped by more than 100 bps across all tenors. Since bottoming out, the curve had seen very little movement on the lower end while longer maturities crept up before falling back down to close out the year.

Now, with inflation spiraling and the economy heating up, the FOMC is in a scramble to raise their policy rate. As a result, shorter Treasuries are on the rise while longer rates stay relatively anchored.

The key spread economists follow is between the 2- and 10-year Treasuries. The relationship between these two speaks to the market's sentiment regarding the economy's long-term health.

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Source: Board of Governors of the Federal Reserve System – Interest Rates & Federal Open Market Committee (FOMC) Projections materials, March 2022
Next Summary of Economic Projections Release: June 14-15

Interest Rates and FOMC Policy

Table 8: Federal Funds Rate: Midpoint of target range or target level (Percent)	2022	2023	2024	Longer Run
4.000				
3.875				
3.750				
3.625		2	2	
3.500				
3.375		1	2	
3.250				
3.125	1	2	1	
3.000				2
2.875		3	3	
2.750				
2.625	1	3	2	
2.500				5
2.375	3	4	3	1
2.250			1	6
2.125	2	1	2	
2.000				1
1.875	5			
1.750				
1.625	3			
1.500				
1.375	1			
1.250				
1.125				
1.000				

After a post-recession peak near 160 bps back in March 2021, the spread dropped negative in early April 2022. Though back to 33 bps as of April 12, the recent dip does not bode well given the spread's success in predicting looming recessions.

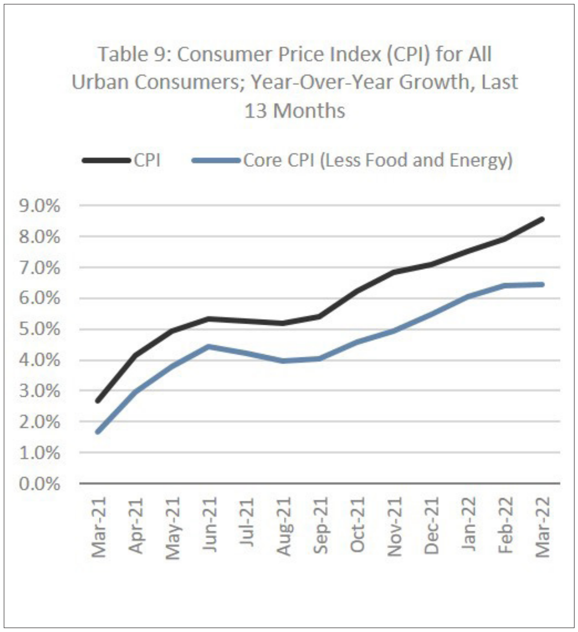
The FOMC does not like to trick the market, so fed funds rate moves are typically signaled and priced in well before the announcement date.

As detailed in Table 8, the median of committee members expect 175 bps of movement (or seven rate hikes) in 2022. That's 150 bps of movement in addition to the 25 bps hike in March 2022.

One hawkish member believes the range could and should be as high as 3% to 3.25% by year-end, the equivalent of 12 rate hikes in a single year.

Source: Board of Governors of the Federal Reserve System – Interest Rates & Federal Open Market Committee (FOMC) Projections materials, March 2022
Next Summary of Economic Projections Release: June 14-15

Prices: Consumer Inflationary Measure



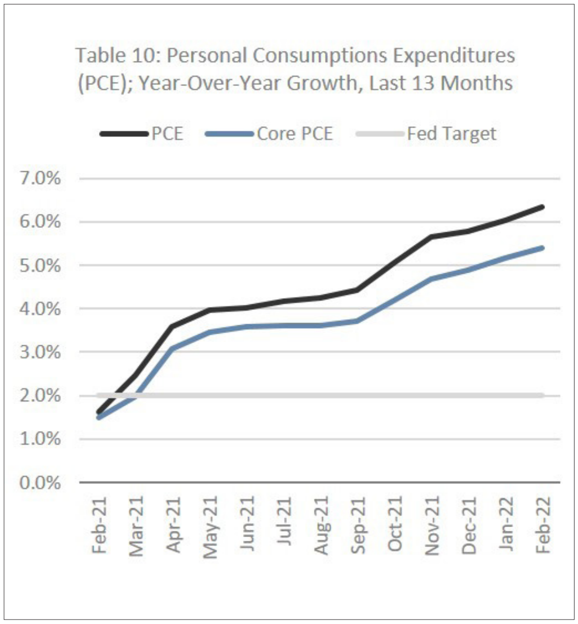
In measuring the purchasing value of the U.S. dollar, two indices rise above the rest. Both track the price level of a basket of goods but differ in a myriad of ways including the weights applied to different items in the basket, accounting for changes in the basket and simply what items are included in the basket.

Historically the higher of the two rates, the Consumer Price Index (CPI) attempts to capture the cost of what households are buying. Once the preferred measure of the FOMC, CPI is tracked by the U.S. BLS.

At the height of the COVID-19 pandemic, "headline" CPI had seen a sharp decline but has since skyrocketed to 8.6%.

This index differs from the "core" measure in that it includes the typically more volatile prices of food and energy.

When gauging the general direction of the economy, the core figure is more often used. However, milk and gasoline are essential purchases in every household, so it's important to monitor both versions of the index.



The second and more often cited inflationary measure is the Personal Consumption Expenditures index (PCE). Based on surveys of business sales, the Fed targets 2% for the core measure when setting monetary policy.

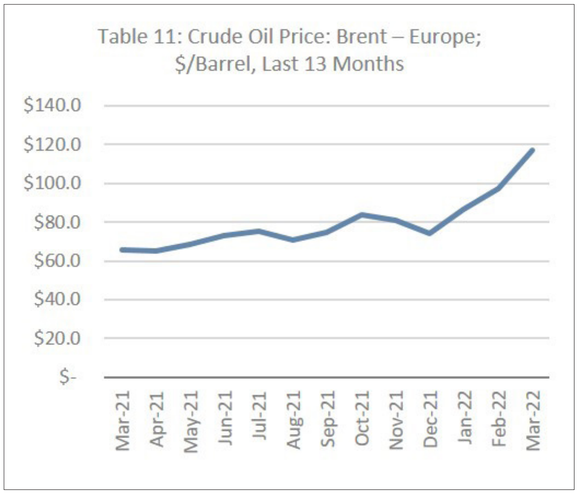
In August 2020, an adjustment was made to how the measure is interpreted allowing for inflation to run higher than the standard 2% target before hiking interest rates.

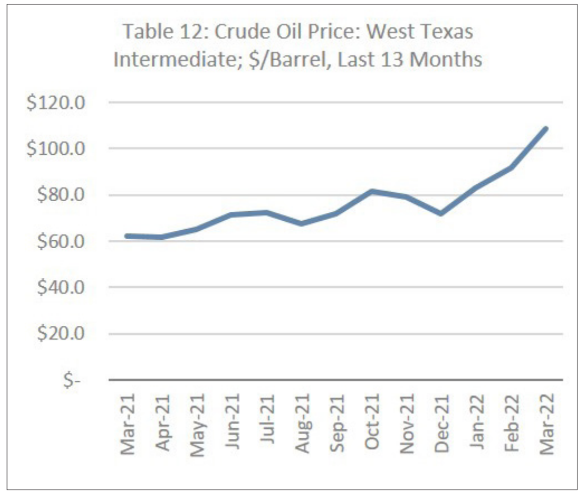
The new approach has been coined as "average inflation targeting."

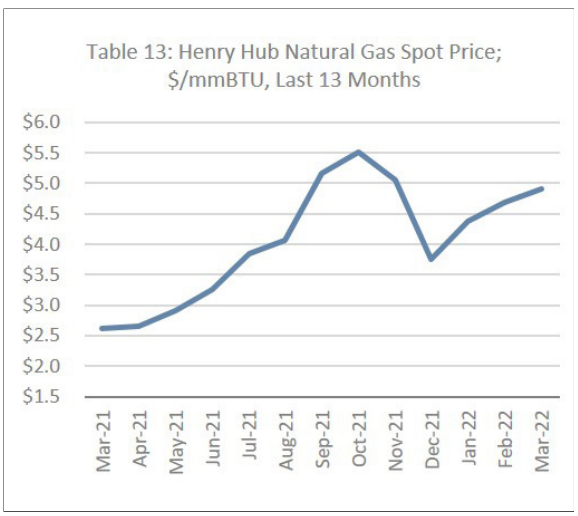
After trending up to near 2% in early 2021, core PCE inflation has boomed. At 5.4% in February 2022, core PCE is more than double the rate once targeted by the FOMC and has trended at or above 3.1% since April 2021. The persistently high level is of major concern to the FOMC, reflected by the rate hikes signaled in the most recent Summary of Economic Projections.

Source: U.S. Bureau of Labor Statistics (CPI) and U.S. Bureau of Economic Analysis (PCE), March 2022 and February 2022 releases, respectively
Next CPI Release: May 11, 2022 (April 2022 data)
Next PCE Release: April 29, 2022 (March 2022 data)

Prices: Energy







Two different prices of crude oil are generally tracked by those monitoring the energy sector: Brent (European) and West Texas Intermediate (WTI). A number of factors can contribute to differences between the prices including extraction and production, shipping and storage costs, content quality and politics such as trade tensions.

Thus, it is important to look at both figures rather than the global price of oil alone to get an accurate depiction of the energy landscape.

Since Russia invaded Ukraine, and given the role both countries play in the global energy market and the uncertainty that has ensued, both Brent and WTI oil barrel prices have exploded.

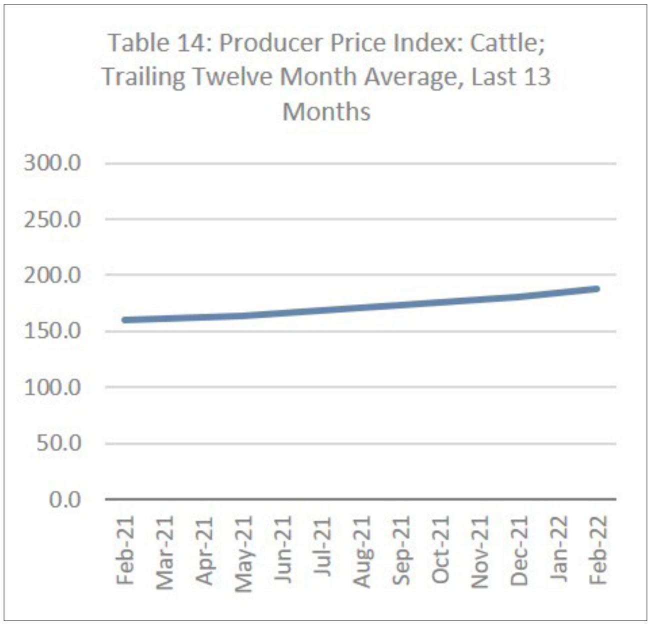
Currently, Brent is trading at about a $9 premium to WTI. Though the conflict has caused reactivation of oil rigs in the District's key energy states of Oklahoma and Colorado, a swift resolution would presumably have a more beneficial impact to the District as a whole.

Often reflective of simple demand dynamics, the price of natural gas typically peaks in the winter months and idles in the summer. However, the war overseas has markets reeling.

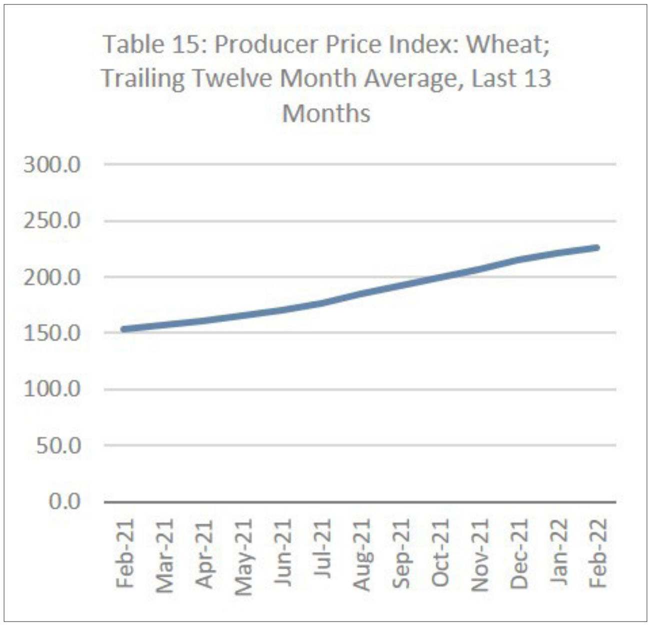
With much of Europe relying on American liquified gas, the price has been driven up domestically when prices normally begin to subside during the warmer spring months. The price per million British thermal units is up $2.30 compared to March of this past year.

Source: U.S. Energy Information Administration – Spot Prices (available daily)

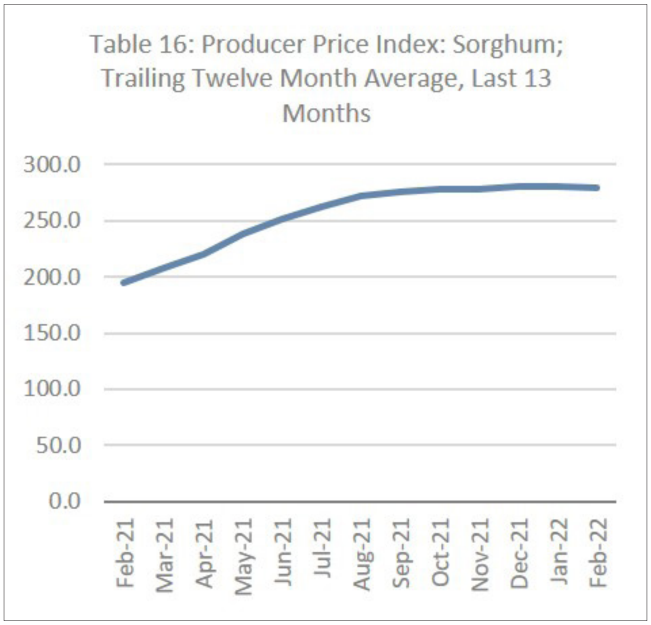
Prices: Farm & Agriculture



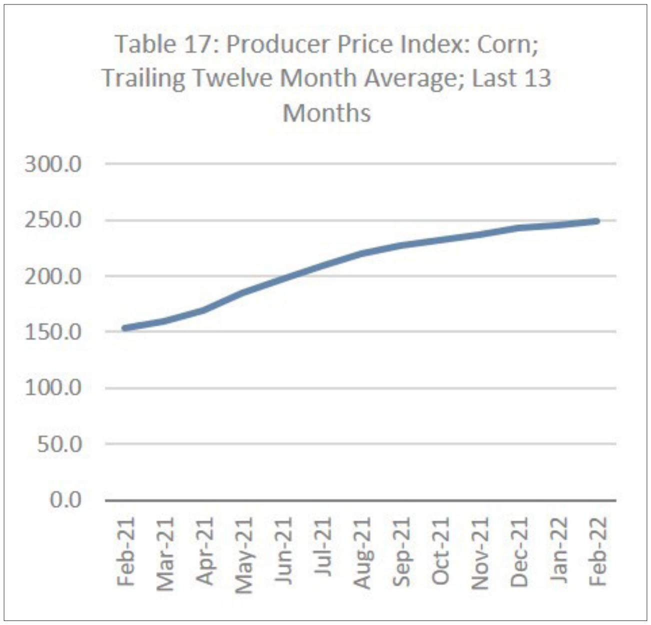
Tenth District state rankings in U.S. cattle production — 2nd Oklahoma, 4th Nebraska, 6th Kansas, 17th Colorado



Tenth District state rankings in U.S. wheat production — 2nd Kansas, 6th Oklahoma, 11th Colorado, 14th Nebraska



Tenth District state rankings in U.S. sorghum production — 1st Kansas, 3rd Nebraska, 5th Oklahoma, 6th Colorado



Tenth District state rankings in U.S. corn production — 3rd Nebraska, 6th Kansas, 17th Colorado, 28th Oklahoma

Source: U.S. Bureau of Labor Statistics – Producer Price Indices, February 2022
Next Release: April 13, 2022 (March 2022 data)

Prices: Housing

Table 18 depicts the All-Transactions House Price Index (HPI) by state for the Tenth District.

According to the Federal Housing Finance Agency, the HPI is a broad measure of the movement of single-family house prices. The HPI is a weighted, repeat-sales index, meaning that it measures average price changes in repeat sales or refinancings on the same properties.

Data is obtained by reviewing repeat mortgage transactions on single-family properties whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac since 1975.

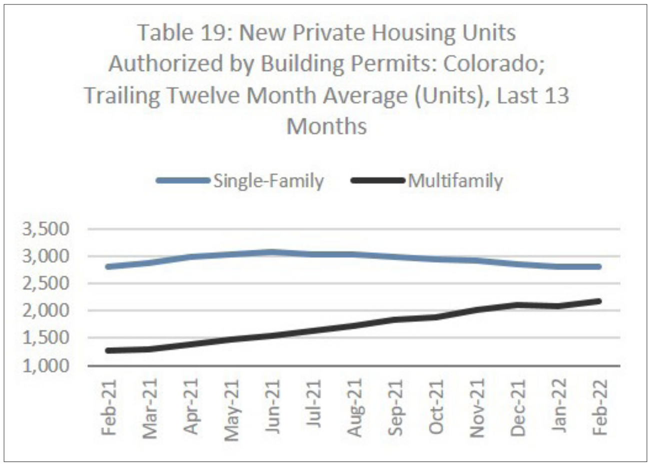
Much like the rest of the U.S., housing prices in District states have seen an uptick in recent quarters. High demand resulting from record-level savings rates has combined with low supply and costly inputs to create a very hot housing market.

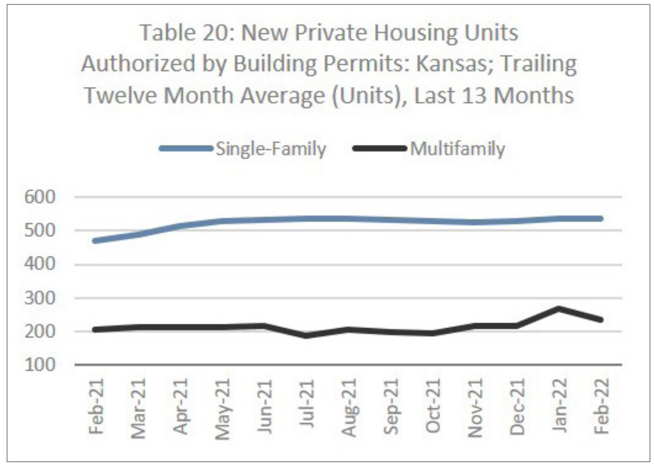
Colorado, currently the hottest housing market in Tenth District, had been surpassed by Kansas for most of 2020. All four District states posted YoY price growth above 14% for the second straight quarter in Q4 2021, a seemingly unsustainable figure given the trends in wage measures.

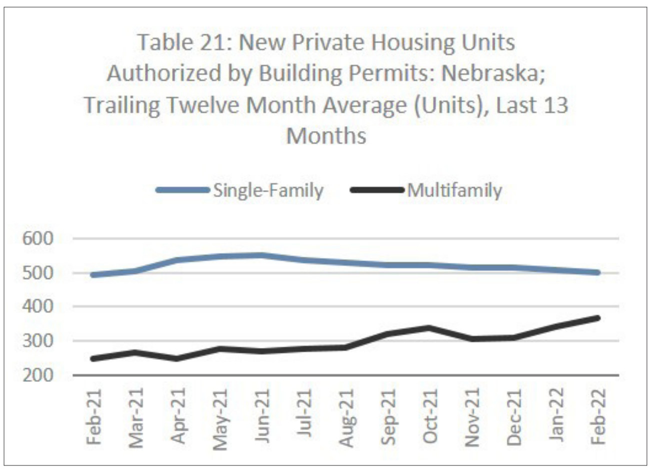
In the fourth quarter of 2021, the U.S. on a whole saw 17.9% YoY growth, higher than all but Colorado in the District.

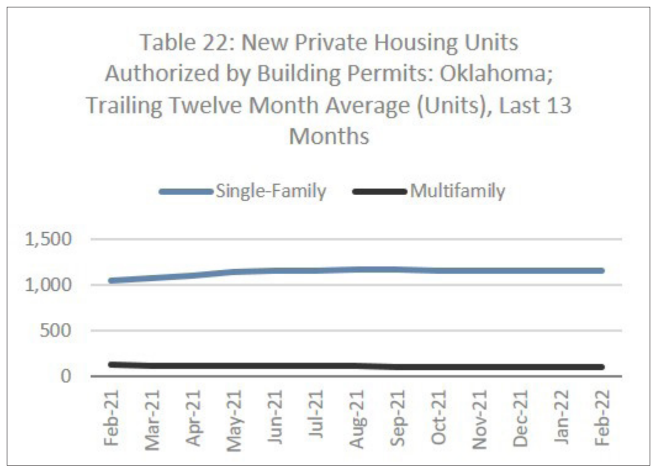
Source: U.S. Federal Housing Finance Agency – House Price Indices, Q4 2021
Next Release: May 31, 2022 (Q1 2022 data)

Housing Numbers









Tables 19-22 depict single-family and multifamily housing units authorized by building permits for each state in the District. According to the U.S. Census Bureau, these numbers provide a general indication of the amount of new housing stock that may have been added to the housing inventory.

Since not all permits become actual housing starts and starts lag the permit stage of construction, these numbers do not represent total new construction but should provide a general indicator on construction activity and the local real estate market. Authorized permits can vary greatly from month to month, so a trailing 12-month average is used to provide a general trend.

Most notable among the four District states is Colorado, accounting for more than half of all building permit authorizations on both a single- and multifamily basis over the past year. Permits for multifamily housing have nearly doubled in Colorado.

Another notable trend is the shrinking disparity between single-family and multifamily housing. Though relatively flat in Kansas and Oklahoma, the difference between single-family and multifamily permits has shrunk considerably in Colorado and Nebraska.

One year ago, multifamily permits accounted for 31% of authorizations in Colorado and 33% in Nebraska. Today, those numbers have risen to 44% and 42%, respectively.

Source: U.S. Census Bureau Building Permits Survey – February 2022
Next Release: April 19, 2022 (March 2022 data)