



CALIFORNIA STATE UNIVERSITY  
**BAKERSFIELD**™

School of Business and  
Public Administration

Volume 26, Issue 3

# Kern Economic Journal

Winner of the Award for Merit from California  
Association for Local Economic Development

2024 Third Quarter

## Featured Articles:



Latest Estimates Show  
that Kern County's  
Economy Grew by 5.2%



Using Nudges to  
Enhance Agricultural  
Safety





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*KERN ECONOMIC JOURNAL* is a quarterly publication (February, May, August, November) of California State University, Bakersfield. Its purpose is to track local trends and analyze regional, national, and global issues that affect the economic well-being of Kern County. The journal provides useful information and data that can help the community make informed economic decisions. Sources of funding for this journal include university contributions and sponsorship and subscription fees.

Editorial and analytical articles on important local, regional, national, and international issues and trends are invited for *consideration* of publication in the journal. Articles (not exceeding 800 words in length) must be submitted to the Managing Editor in electronic copy. Individual authors are responsible for the views and research results.

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# Kern Economic Journal



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# Economy at a Glance!

2024 THIRD QUARTER  
BY DR. NYAKUNDI MICHIEKA  
& DR. RICHARD S. GEARHART III

## National Economy<sup>1</sup>

Real GDP increased at an annual rate of 3.1 percent in the third quarter of 2024. In the second quarter of 2024, real GDP increased by 3.0 percent.

The increase in **real GDP** reflected increases in consumer spending, exports, nonresidential fixed investment, and federal government spending. Imports also increased in the second quarter. These movements were partly offset by a downturn in private inventory investment, and a larger decrease in residential fixed investment.

**Current-dollar GDP** increased by 5 percent (annual) or \$358.2 billion in the third quarter of 2024, to a level of \$29.37 trillion.

**Current-dollar personal income** increased by \$191.7 billion in the third quarter of 2024. This rise reflected increases in compensation and personal current transfer receipts.

**Real disposable personal income**, which is adjusted for inflation and taxes, increased by 1.1 percent.

**Personal saving** was \$936.6 billion in the third quarter of 2024 compared with \$720.5 billion in the second quarter of 2024.

**Personal saving rate** – personal saving as a percentage of disposable income—was 4.3 percent in the third quarter.

**The Conference Board's Index of Leading Economic Indicators** – a measure of future economic activity – increased by 0.3 percent in November 2024 to 99.7 (2016=100), following a 0.4 percent decline in October.

**The University of Michigan's Consumer Sentiment Index** decreased from 71.1 in the second quarter of 2024 to 68.1 in the third quarter of 2024. The index in the third quarter of 2023 was 69.6 and 56.1 in the third quarter of 2022.

<sup>1</sup>U.S. economic numbers were obtained from the Bureau of Economic Analysis "U.S. Economy at a Glance". This is found at <http://www.bea.gov/newsreleases/glance.htm>  
The information for the Index of Leading Economic Indicators is found at <https://conference-board.org/data/bcicountry.cfm?cid=1>.  
The University of Michigan Consumer Sentiment Index is found at <http://www.sca.isr.umich.edu/tables.html>

## State Economy<sup>2</sup>

In California, the unemployment rate increased to 5.7 percent in the third quarter of 2024 compared to 5.2 percent in the second quarter. The counties with the highest unemployment rates include Colusa (9.4), Imperial (19.6), Kern (8.6), Merced (8.9) and Tulare (10.2). Those with the lowest unemployment rates include Inyo (3.9), Marin (4.1), Mono (4.0), San Francisco (3.9) and San Mateo (3.8).

California's labor force increased by 36,900 in the third quarter of 2024. During this period, civilian employment rose by 29,100 workers (from 18.33 million to 18.36 million). Nonfarm enterprises hired 61,733 more workers while farm employment increased by 5,700. The mining and logging sector hired 167 less workers while construction and manufacturing hired 2,133 and 12,200 less employees, respectively. Service sector employment increased from 15.77 million to 15.85 million between the second quarter of 2024 and the third quarter of 2024. The state government hired 5,800 more workers while local government employment increased by 20,500 workers.

## Local Economy

Kern County's labor force increased from 391,300 in the second quarter of 2024 to 397,200 in the third quarter of 2024. Civilian employment increased by 6,467 from 356,467 to 362,933. Nonfarm employment decreased by 3,967 while farming employment went up by 12,700.

In Bakersfield, nonfarm employment changed in the following manner: mining and logging gained 67 workers; construction added 133 workers; manufacturing added 100 workers; and the service industry lost 4,267 workers. Within the service industry, trade, transportation and utilities added 667 workers. Other sectors changed as follows: financial activities added 33 workers; professional and business services added 333 workers; private education and health services added 567 workers while leisure and hospitality gained 100 employees. The number of federal government workers increased by 167 while state government employment reduced

<sup>2</sup> The California economic numbers were obtained from the Bureau of Labor Statistics "Local Area Unemployment Statistics Map". This is found at <https://data.bls.gov/map/MapToolServlet?survey=la&map=county&seasonal=u>.



by 133 workers. The local government lost 5,967 workers.

In Kern County, the unemployment rate varied considerably across cities, ranging from 4.5 percent in Ridgecrest to 21 percent in Lake Isabella. All cities in Kern County witnessed a quarter-to-quarter decrease in the unemployment rate (except Bakersfield and Ridgecrest). The biggest quarter-to-quarter decrease in unemployment rate occurred in Delano where it dropped from 26.97 percent to 18.80 percent. In Bakersfield, the unemployment rate was 6.97 percent in the third quarter of 2024 compared to 5.97 percent in the second quarter. Overall unemployment in the County was 8.7 percent in the third quarter of 2024 compared to 8.9 percent in the second quarter.

In the third quarter of 2024, the median price of a home in Bakersfield was \$413,333 compared to \$405,317 in the second quarter. Median home prices were \$4,650 higher than they were four quarters ago. Within the county, the city of Taft had the lowest median home prices, averaging \$252,167, while the region with the highest median home prices was Rosamond, at \$429,997.

The weighted price index for the five publicly traded companies doing business in Kern County (Sierra Bancorp, Tejon Ranch Company, Chevron Corporation U.S., Granite Construction, and Wells Fargo Company) increased by 12.3 percentage points from \$123.7 to \$138.9 (quarter to quarter). The index was also 38.2 percentage points greater than it was four quarters ago. Companies gained/lost as follows: Chevron (decreased 4.4 percent quarter-over-quarter), Tejon Ranch (increased 4.2 percent quarter-over-quarter), Granite Construction (increased 31.7 percent quarter-over-quarter), Wells Fargo (decreased 6.8 percent quarter-over-quarter) and Sierra Bancorp (increased 25.7 percent quarter-over-quarter).

The average price of a barrel of crude oil (WTI) decreased by \$6 to \$70.9 in the third quarter of 2024 while the average retail price of a gallon of gasoline in Bakersfield decreased by \$0.51 to \$4.51. The unit price of California's Class III milk was \$21.26 in the third quarter of 2024 compared to \$17.97 in the second quarter. The Index of Farm Price Parity in the third quarter of 2024 (0.90) was higher than that of the second quarter of 2024 (0.89).

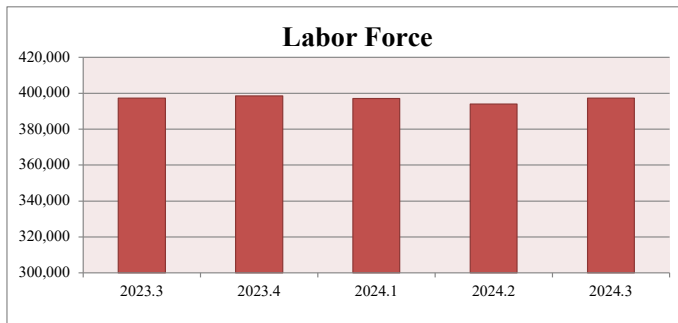
# Tracking Kern's Economy<sup>1</sup>

DR. NYAKUNDI MICHIEKA &  
DR. RICHARD S. GEARHART III  
2024 THIRD QUARTER

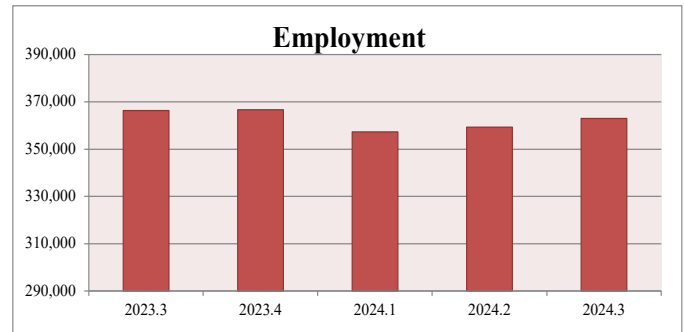
## Labor Market

*We average monthly data to calculate quarterly data then adjust for seasonality in the series.*

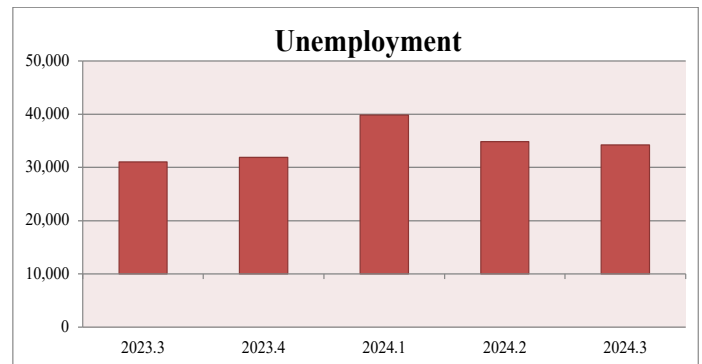
**Labor Force** – The civilian labor force increased by 3,133 individuals, rising from 394,067 in the second quarter of 2024 to 397,200 in the third quarter of 2024. The labor force estimates for the third quarter of 2024 were similar to those recorded in the third quarter of 2023 where they averaged 397,000. The Bureau of Labor Statistics defines the labor force participation rate as the proportion of the working-age population that is either working or actively looking for work.



**Employment** – In the third quarter of 2024, Kern County hired 3,667 more workers (compared to the previous quarter) as total employment increased from 359,267 to 362,933. This represents a 0.91 percent decrease in employment compared to the third quarter of 2023 when 366,267 persons were employed. Second to third quarter employment increased by 3,933 in 2023 while in 2024, second to third quarter employment increased by 3,667.

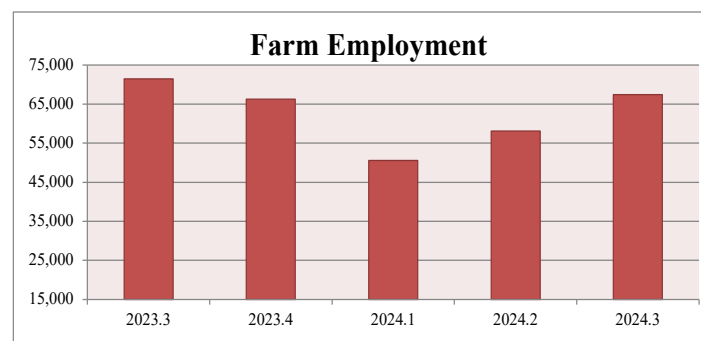
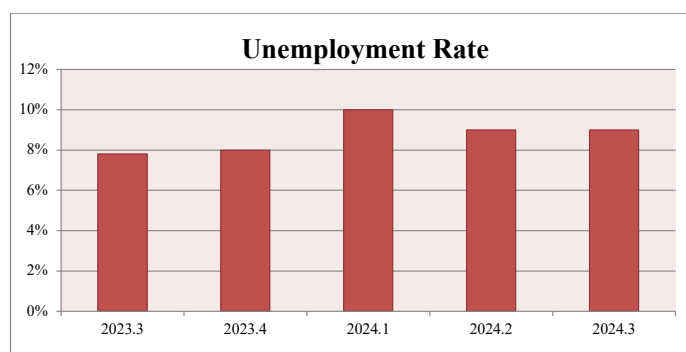


**Unemployment** – Quarter-to-quarter unemployment decreased by 600 as the number of jobless workers decreased from 34,833 to 34,233. The number of unemployed workers is 10.4 percent higher than it was four quarters ago. In the third quarter of 2023, there were 31,000 unemployed workers.



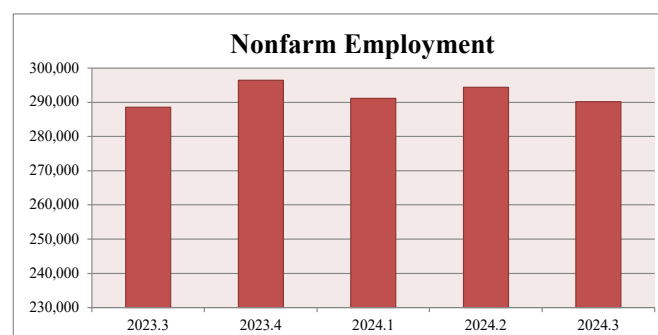
**Unemployment Rate** – Kern County's year-to-year unemployment rate increased by 1.2 percentage points from 7.8 percent in the third quarter of 2023 to 9 percent in the third quarter of 2024. The unemployment rate for the second quarter of 2024 was also 9 percent. Kern County's second quarter unemployment rate (9 percent) was almost double that of California's (5.7 percent).





The unemployment rate varied considerably across cities, ranging from 4.5 percent in Ridgecrest to 21 percent in Lake Isabella. Quarter to quarter unemployment rate decreased in all cities except Bakersfield and Ridgecrest. The biggest rise in the unemployment rate occurred in Bakersfield, where it increased from 5.87 to 6.97 percent. In Bakersfield, the unemployment rate was 6.3 percent four quarters ago.

**Nonfarm Employment** – Nonfarm industries employed 4,167 fewer workers in the third quarter of 2024, as the number of workers decreased from 294,367 to 290,200. The industries hired 1,667 (or 0.58 percent) more workers compared to four quarters ago.

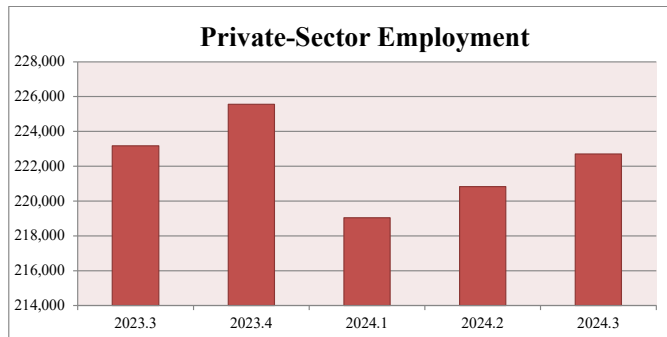


In Bakersfield, nonfarm employment changed in the following manner: mining and logging employment increased by 67 workers; construction gained 133 workers; manufacturing added 100 workers while the service sector lost 4,267 workers. Within the service sector, trade, transportation, and utilities added 667 workers; financial activities added 33 workers; professional and business services added 333 workers; health care and social assistance added 567 workers while leisure and hospitality added 100 employees. Federal government employment increased by 167 while the number of state employees decreased by 133. The local government lost 5,967 workers.

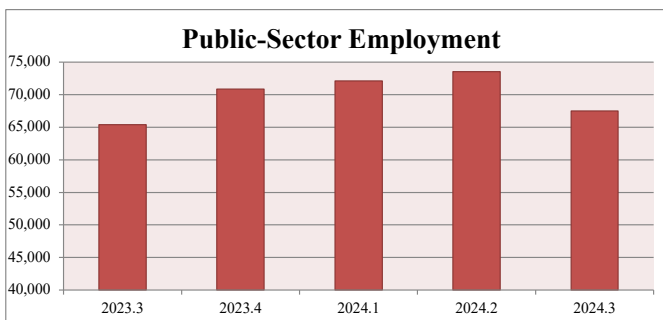
**Private-Sector Employment** – Nonfarm employment is comprised of private- and public-sector employment. In the third quarter of 2024, private companies hired 1,867 more workers compared to the second quarter of 2024. They hired 0.9 percent more workers in the third quarter of 2024 than they did four quarters ago (in 2023). Currently, the private sector employs 222,700 individuals.

Unemployment Rate of Cities			
Location	Unemployment Rate (%)	Location	Unemployment Rate (%)
<b>KERN COUNTY</b>	8.6%	McFarland	7.7%
Arvin	11.1%	Mojave	8.5%
Bakersfield	7.0%	Oildale	13.7%
California City	17.6%	Ridgecrest	4.5%
Delano	18.8%	Rosamond	9.3%
Edwards	8.2%	Shafter	7.0%
Frazier Park	8.4%	Taft	5.9%
Lake Isabella	20.9%	Tehachapi	8.1%
Lamont	8.3%	Wasco	14.7%
Note: City-level data are not adjusted for seasonality and “informal” market workers.			

**Farm Employment** – In the third quarter of 2024, Kern County hired 9,367 more farm workers compared to the second quarter. As a result, quarter-to-quarter farm employment increased to 67,433 from 58,067. An average of 71,500 workers were employed in the farming sector in the third quarter of 2023. The year-over-year number of farm workers decreased by 4,067.

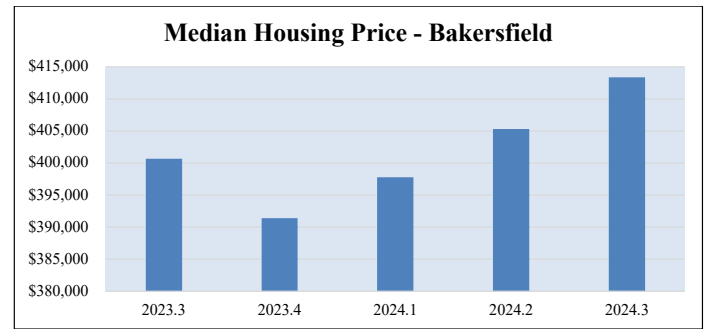


**Public-Sector Employment** – The public sector consists of federal, state, and local government agencies. The local-government labor market includes workers employed by county and city agencies, and public education. In the third quarter of 2024, government agencies hired 6,033 less workers, as employment decreased from 73,533 to 67,500 – an 8.2 percent decrease. Compared to the third quarter of 2023, 3.3 percent more workers were hired in the public sector.

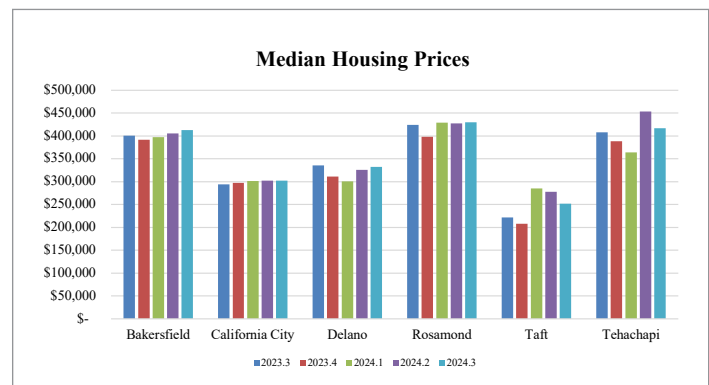


## Housing Market

**Housing Price** – In the third quarter of 2024, Bakersfield's housing prices rose by \$8,017 (1.98 percent) compared to the second quarter of 2024. The median price of a home in Bakersfield averaged \$413,333 in the third quarter of 2024 compared to \$400,667 in the third quarter of 2023. Prices were 1.2 percent higher than they were four quarters ago.



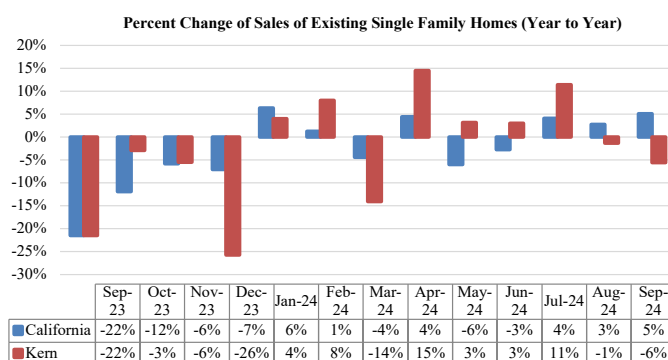
**Regional Housing Prices** – Changes in housing demand in Bakersfield are likely to spillover to surrounding cities as individuals who are on the margin of buying or selling are likely not located in the Bakersfield Metropolitan Statistical Area (MSA). An assessment of second-quarter-to-third-quarter (2024) changes in median sales price indicates that home prices increased in all cities in Kern County except for Taft and Tehachapi where they decreased by \$26,083 and \$36,222, respectively. Bakersfield recorded the largest increase in median home prices (+\$8,017). The average (annual) price change was -2 percent across all regions in the county. The median home price across all regions averaged \$357,999 in the third quarter of 2024 compared to \$332,542 in the third quarter of 2023.



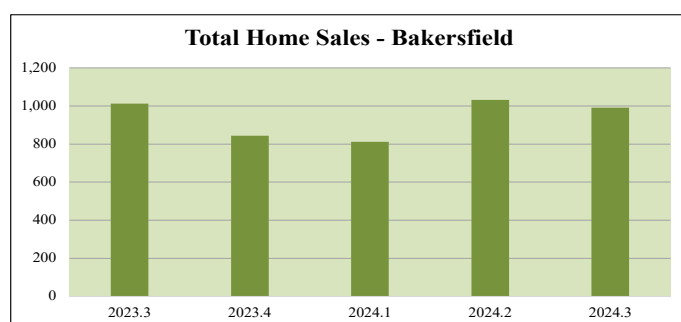
Year-over-year home prices changed as follows: Bakersfield (+1.16 percent), California City (+2.83 percent), Delano (-2.83 percent), Rosamond (+0.77 percent), Taft (+25.38 percent) and Tehachapi (+11.12 percent).



Location	Median Price (last year)	Median Price (this year)	Price Change (\$) (Annual)	Price Change (%) (Annual)
	2023.3	2024.3	2023.3 to 2024.3	2023.3 to 2024.3
Bakersfield	400,667	413,333	4,650	1.16%
California City	294,000	302,500	8,333	2.83%
Delano	335,317	332,667	-9,483	-2.83%
Rosamond	424,083	429,997	3,250	0.77%
Taft	221,917	252,167	56,333	25.38%
Tehachapi	408,167	417,333	45,388	11.12%
Average	347,358	357,999	18,079	6.41%

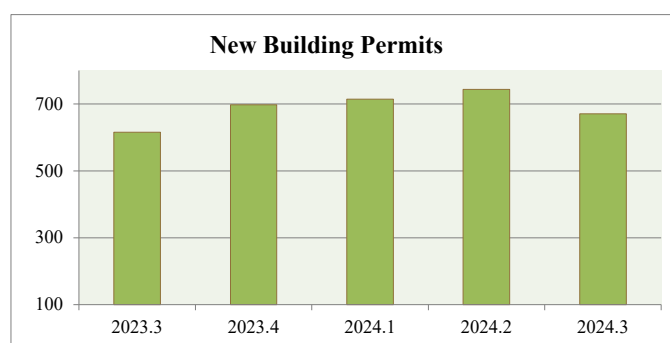


**Home Sales** – In Bakersfield, quarter-to-quarter sales of residential units decreased by 40 units, from 1,031 in the second quarter of 2024 to 991 in the third quarter of 2024. An average of 21 less units were sold in the third quarter of 2024 compared to the third quarter of 2023.

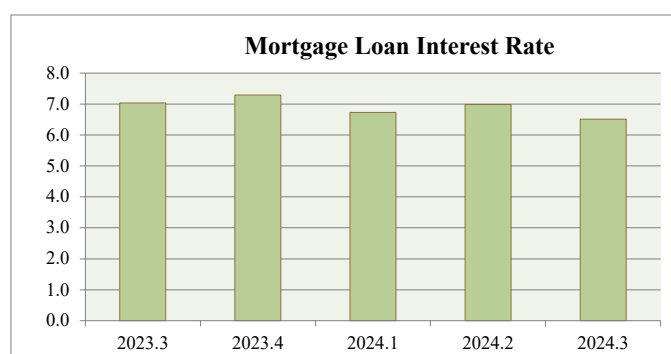


**Growth in Housing Sales** –We compare growth in sales of existing single-family homes in Kern County with growth in sales in California. Positive values indicate that more homes were sold this year compared to last year. In September 2024, 6 percent less homes were sold in Kern County compared to September last year. In California, sales were 5 percent higher in September compared to September 2023. The average growth in home sales in California between September 2023 and September 2024 was –2.7 percent while the number was –2.5 percent in Kern County.

**New Building Permits** – In the third quarter of 2024, Kern County issued 73 less permits for construction of new privately-owned dwelling units compared to the second quarter of 2024. A total of 671 permits were issued this (third) quarter compared to 615 in the third quarter of last year (2023). The number of permits issued has dropped following the surge that took place over the last 4 quarters. Over the last five years, the average number of permits issued in the third quarter is 574.

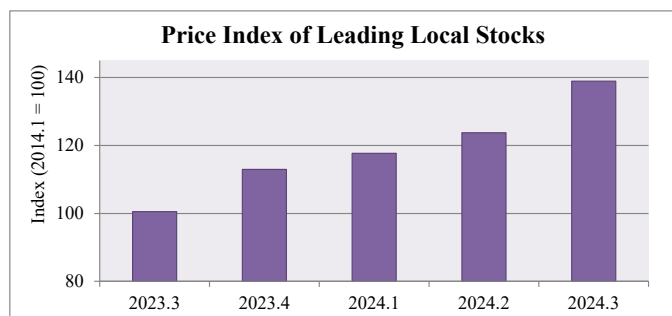


**Mortgage Interest Rate** – In the third quarter of 2024, the interest rate on thirty-year conventional mortgage loans decreased to 6.51 percent (down from 6.99 percent in the second quarter of 2024). The interest rate last year (third quarter of 2023) was 7.04 percent.

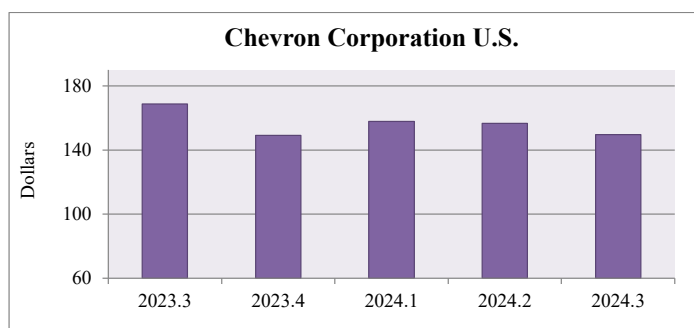


## Stock Market

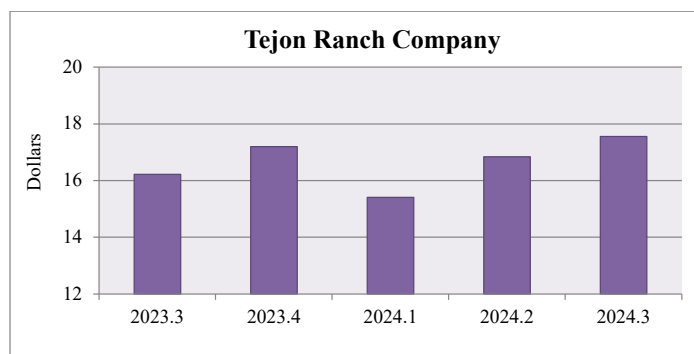
In the third quarter of 2024, the composite price index (2014.1=100) of the five publicly traded companies doing business in Kern County increased by \$15.20, from \$123.70 to \$138.90 (quarter to quarter change). The index was 38.2 percentage points higher than it was four quarters ago. Average “close” prices were measured for five local market-movers: Chevron Corporation U.S., Tejon Ranch Company, Granite Construction, Wells Fargo Company, and Sierra Bancorp.



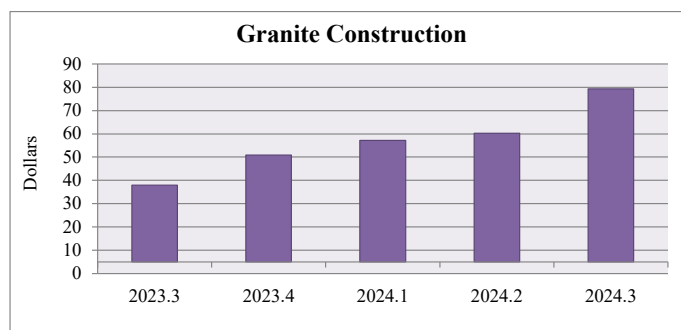
**Chevron Corporation U.S.:** Compared to the second quarter of 2024, CVX lost \$6.82 (or -4.4 percent) per share as its price decreased from \$156.52 to \$149.70. Relative to the third quarter of 2023, CVX was down \$18.92 (or 11.2 percent).



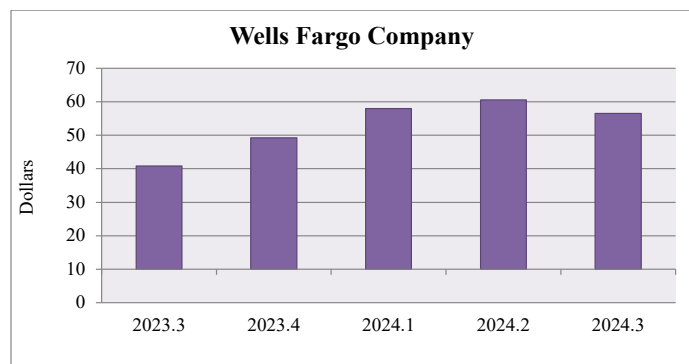
**Tejon Ranch Company:** TRC gained \$0.71 (or 4.2 percent) per share as its stock price increased from \$16.84 to \$17.55 between the second and third quarter of 2024. Compared to the third quarter of 2023, TRC stock price was up \$1.33 (or 8.2 percent).



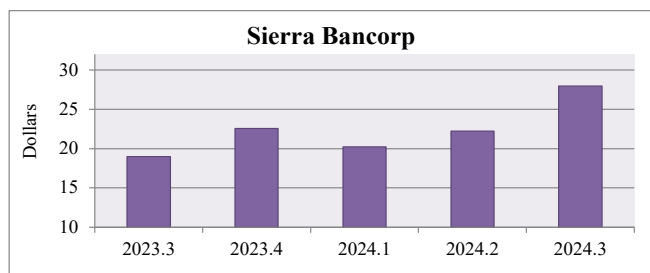
**Granite Construction:** GVA gained \$19.09 (or 31.7 percent) per share as its stock price increased from \$60.24 to \$79.33 between the second quarter of 2024 and the third quarter of 2024. GVA gained \$41.31 (or 108.7 percent) over the last four quarters.



**Wells Fargo Company:** WFC lost \$4.10 (or 6.8 percent) per share as its stock price decreased from \$60.59 to \$56.49 between the second quarter of 2024 and the third quarter of 2024. Relative to the third quarter of 2023, WFC was up \$15.63 (or 38.3 percent).



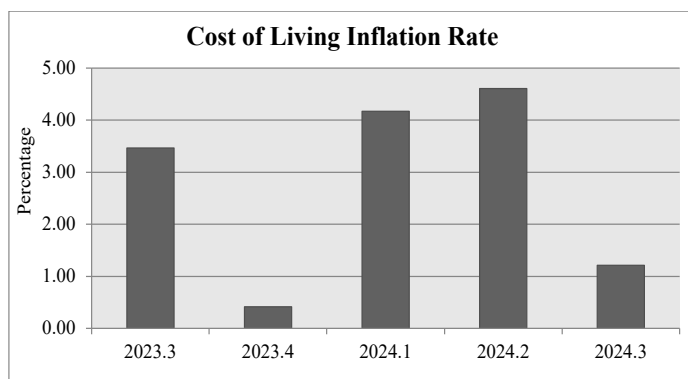
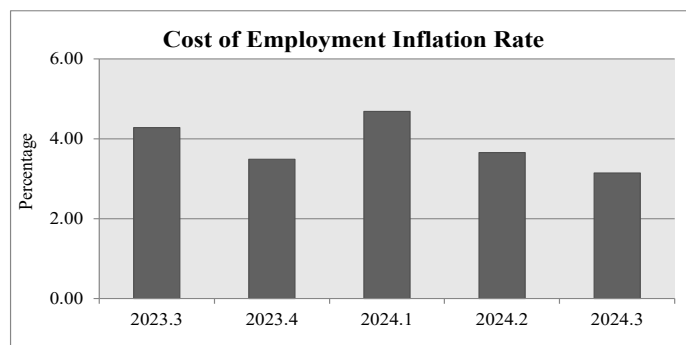
**Sierra Bancorp:** BSRR gained \$5.72 (or 25.7 percent) per share as its price increased from \$22.24 to \$27.96 (quarter to quarter). BSRR gained \$9 (or 47.5 percent) in the third quarter of 2024 compared to the third quarter of 2023.



**Cost of Employment** – The Employment Cost Index (December 2005 = 100) for all civilian workers increased from 165.5 in the second quarter of 2024 to 166.8 in the third quarter of 2024, causing quarter-to-quarter employment inflation to rise by 3.14 percent.

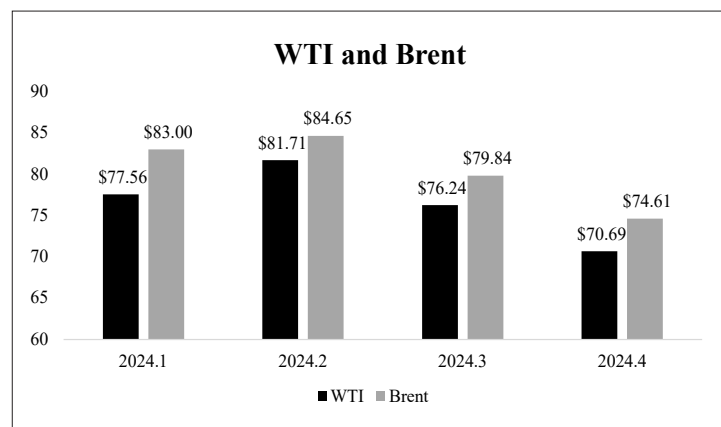
## Inflation

**Cost of Living** – In the third quarter of 2024, the Consumer Price Index for all urban areas (1982-84 = 100) increased from 313.9 to 314.9. As a result, inflation for the cost of living accelerated at an annual rate of 1.21 percent. The index was 306.8 points in the third quarter of 2023.

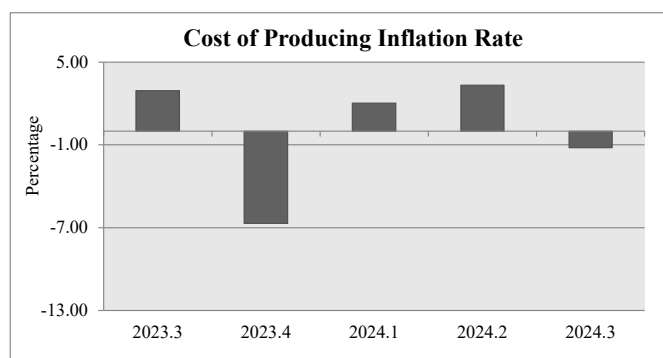


## Energy

**Price of Oil** – The spot price of WTI in the third quarter of 2024 was \$70.69 compared to that of Brent which was \$74.61. Compared to four quarters ago, the spot price of WTI and Brent was \$8 and \$9 less, respectively.

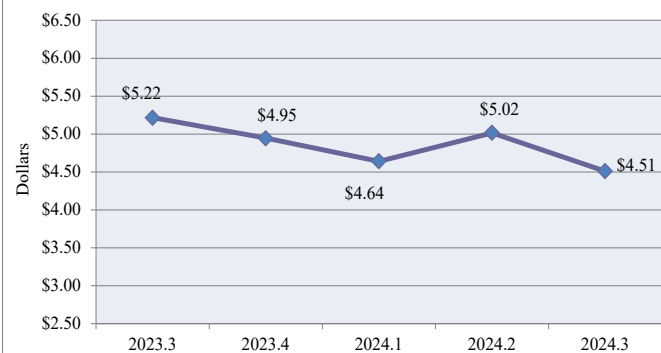


**Cost of Production** – The Producer Price Index for all commodities (1982 = 100) decreased between the second and third quarter of 2024, from 255.89 to 255.12, respectively. The inflation rate for the cost of producing decreased at an annualized rate of 1.21 percent. The cost of production inflation rate was 256.79 four quarters ago.



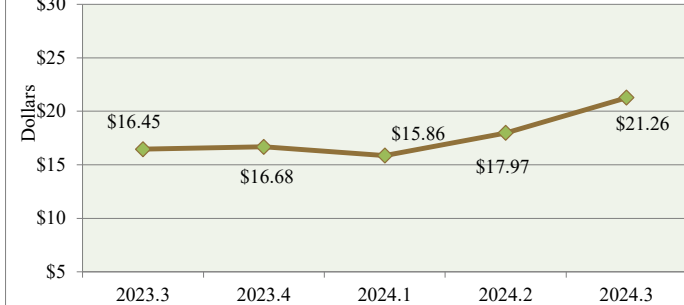
**Price of Gasoline** – In the Bakersfield MSA, the average retail price of gasoline decreased by \$0.51 to \$4.51 between the second and third quarter of 2024. Average gasoline prices were \$4.51 in the third quarter of 2024 compared to \$5.22 in the third quarter of 2023.



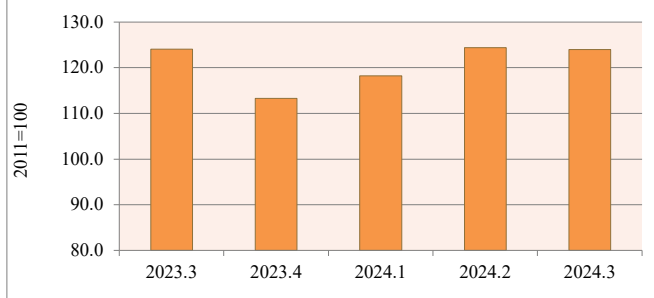
**Price of Gasoline in Bakersfield**

## Commodity Prices

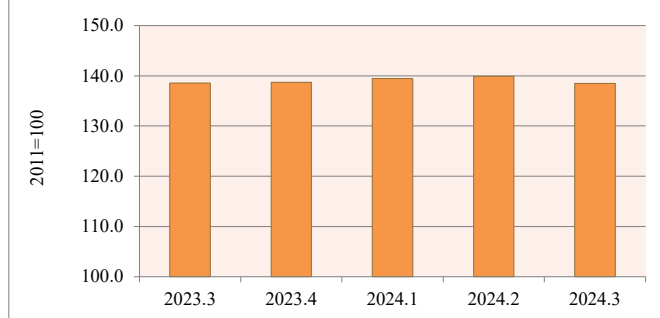
**Price of Milk** – The unit price of California’s Class III milk increased in the third quarter of 2024 by \$3.29, to \$21.26. Milk prices were \$4.81 (or 29.3 percent) higher than they were four quarters ago.

**Price of Milk in California**

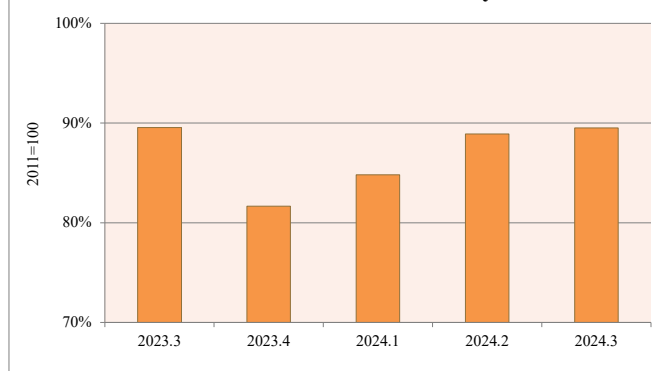
**Farm Prices** - In the third quarter of 2024, the National Index of Prices Received by Farmers for all farm products (2011 = 100) decreased by 0.43 points from 124.4 in the second quarter of 2024 to 124. The index is 0.08 percent lower than it was four quarters ago in the third quarter of 2023.

**Index of Farm Prices Received**

Meanwhile, the National Index of Prices Paid by farmers for commodities, services, interest, taxes, wages, and rents decreased by 1.02 percentage points. This means that farmers were worse off in the third quarter of 2024 compared to the second quarter of 2024.

**Index of Farm Prices Paid**

We measure the Index of Farm Price Parity as the ratio Index of Prices Received to the Index of Prices Paid. In the third quarter of 2024, the Index of Farm Price Parity was 90 percent compared to 89 percent in the second quarter. Four quarters ago, the price ratio was 90 percent.

**Index of Farm Price Parity**

<sup>1</sup> Source – Online databases: <http://www.labormarketinfo.edd.ca.gov>; [www.usda.com](http://www.usda.com); [www.bakersfieldgasprices.com](http://www.bakersfieldgasprices.com); [www.bea.gov](http://www.bea.gov); [www.car.org](http://www.car.org); [www.census.gov](http://www.census.gov); <https://www.redfin.com>; <https://www.cafmmo.com>; [www.bls.gov](http://www.bls.gov)

# Latest Estimates Show that Kern County's Economy Grew by 5.2%

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California State University, Bakersfield

## 1. Economic Growth in Kern County

Kern County's GDP grew by 5.2 percent from \$44.6 billion in 2022 to \$46.9 billion in 2023 (U.S. Bureau of Economic Analysis 2025a). This is after a fall in GDP between 2021 and 2022, where Kern County's economy declined by 3.8 percent. Figure 1 illustrates that Kern County's economy grew significantly in the early 2000s. Between 2001 and 2013, year-to-year growth averaged +5.1 percent; in the decade following, average growth rates were only +0.7 percent.

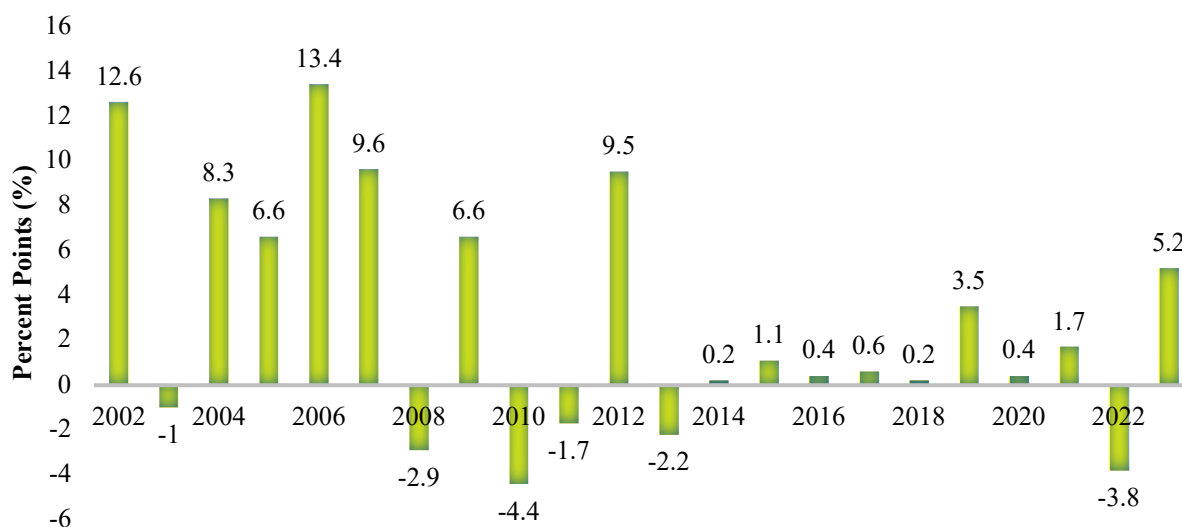
Data from the U.S. Bureau of Economic Analysis (2025b) indicate that the growth in 2023 GDP was driven by a 3.2 percent increase in mining, quarrying, and oil and gas extraction, a 0.71 percent increase in retail trade, and a 0.52 percent increase in finance, insurance, real estate, rental, and leasing. Utilities and construction activities experienced growth rates of -0.3 and -0.2 percent, respectively. Between 2021 and 2022, Kern County's GDP dropped from \$46.4 billion to \$44.6 billion, primarily driven by the 2.6 percent decrease in mining, quarrying, and oil and gas extraction, and the 2.1 percent decrease in agriculture. During that period, the finance, insurance, real estate, rental, and leasing grew by 0.9 percent.

**Figure 1: Kern County's GDP (2001 – 2023)**



Source: U.S. Bureau of Economic Analysis (2025a).

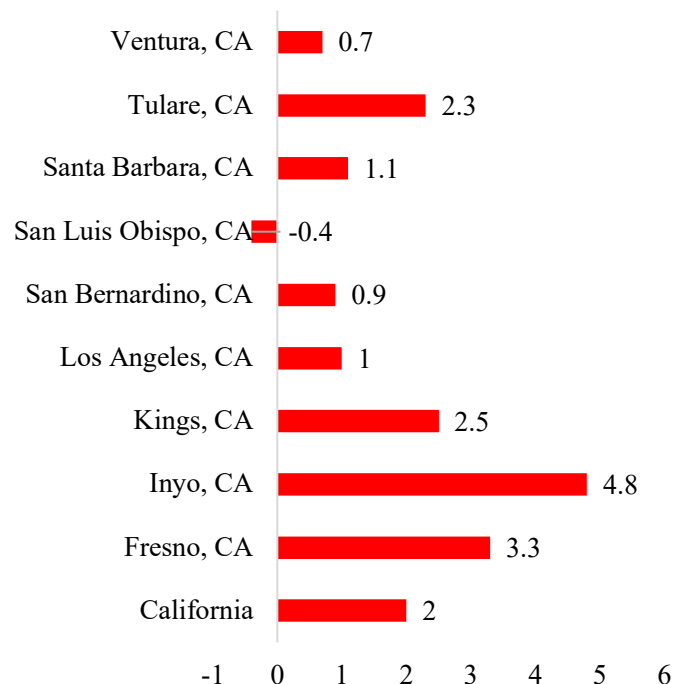
An assessment of year-to-year growth rates indicates that Kern County's GDP experienced significant growth between 2011 and 2012, growing by 9.5 percent (Figure 2). The mining, quarrying, and oil and gas industries contributed significantly to this growth.

**Figure 2: Percent Change in GDP (Kern County, 2002 - 2023)**

Source: U.S. Bureau of Economic Analysis (2025b)

## 2. Regional Economic Growth?

Regional data in Figure 3 indicates that most of Kern County's neighbors experienced positive economic growth between 2022 and 2023. Inyo County's GDP grew by 4.8 percent while Fresno County's GDP grew by 3.3 percent. Kings, Tulare, Santa Barbara, Los Angeles and San Bernardino Counties' GDP grew by 2.5, 2.3, 1.1, 1.0, and 0.9 percent, respectively. Only San Luis Obispo County's economy experienced negative economic growth of -0.4 percent. These distributional GDP growth rates were during a time when the California economy grew by 2 percent (U.S. Bureau of Economic Analysis 2025b).

**Figure 3: Percent Change in GDP (2022 – 2023)**

Source: U.S. Bureau of Economic Analysis (2025b)



### 3. How does positive economic growth impact the county?

Positive economic growth provides benefits to individuals, businesses and county governments. Higher incomes mean individuals can buy more goods and services, including healthcare. Economic growth is also associated with lower unemployment, meaning that individuals have better job prospects. Local businesses can grow and hire more workers, and benefit from higher revenues from higher levels of purchases from individuals. County governments benefit by generating more revenue from local area taxes, including sales and property taxes, which they can use to improve infrastructure and provide more public services. Economies experiencing growth can attract new investors and businesses, creating a positive feedback loop.

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<sup>1</sup>A recent paper by Miller et al. (2024) does find that there may be no income-health gradient. They found that a universal basic income has an immediate, but no long-term impact, on physical health, with no short- or long-term impacts on mental health.

# Using Nudges to Enhance Agricultural Safety

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Agricultural workers face a myriad of risks, including exposure to pesticides and other chemicals, heat stress and sun exposure, physical injuries from transportation and machinery accidents, falls and slips, and ergonomic risks (such as back and shoulder pain). Over the 2021- 2022 period, workers in the agricultural sector reported 21,000 injuries that required time off. Nearly a quarter were the result of falls. During the same period, workers in the agriculture, forestry, fishing, and hunting industries suffered over five times the death rates of the average workers in other industries (NIOSH, 2024). Many efforts have been made to reduce injuries and fatalities. For example, the EPA's Agricultural Workers Protection Standard (WPS) reduces exposure to pesticides. And the Migrant seasonal Agricultural Worker Protection Act (MSPA) discloses working conditions with the goal of ensuring transportation safety.

People often make choices based on cognitive limitations, systematic biases, and emotional responses. Nudges are efforts to overcome these limitations and encourage people to make “better” choices by compensating for problems in their decisions without limiting their choices. This could be accomplished through framing the choices in a way desired outcome or making design choices that compensate for people's tendencies to make mistakes. People who enroll in work savings plans tend to save too little over time because they do not revise their initial choices as their income increases. Knowing this tendency to stay with the original selection (known as status quo bias), an example of a nudge would be to set a higher default savings rate when the employee enrolls in the plan, while still giving the employee the ability to ignore







the default. An example of a design nudge would be the ATM design where the ATM now returns your debit card before the cash is returned to lessen the chance that you will be in a hurry and leave your card in the machine. Nudges have been applied in many areas, including financial decisions, health, energy efficiency, and work performance (Thaler and Sunstein, 2008). Recently, nudges have been applied to worker safety issues in a variety of industries, such as construction and steel production (Tzou, et al., 2024; Costa, et al., 2024).

There are many nudges that could be employed in the agricultural sector to enhance worker safety. Empirical evidence indicates that people are more sensitive to losses than they are to gains of the same magnitude (loss aversion). Therefore, presenting information as potential losses may elicit a stronger response than presenting it as potential gains. For example, you could frame a safety message as “not wearing protective gear can lead to weeks of loss pay due to downtime from injury” instead of “wearing protective gear keeps you safe.” This could also be done by posting information outlining the loss of income and medical costs associated with failure to comply with safety regulations.

Climate change is expected to double the risk of heat to crop workers within the next thirty years (Tigchelaar, 2020). In addition to being exposed to risks from handling pesticides and chemicals, field workers are exposed to risks from dehydration and heat stress. One possible nudge to reduce hydration and heat stress is to provide text messages



or other forms of announcements to alert work crews that they need to take breaks and hydrate at a particular time. You could also designate specific break areas that contain cover for shade and access to hydration options.

Simplifying safety procedures and providing easy access to safety equipment can nudge workers to improve safety conditions. Visual flowcharts and safety checklists can be displayed in prominent locations to nudge employees into more easily processing information. Placing personal protective equipment (PPE) in inaccessible places will ensure that employees are more likely to use the PPE. In addition, positive reinforcements could be provided to employees. For example, employees could be told that most employees use PPE (e.g., announcements that “90% of workers use PPE”). This can help create social norms that make it more likely that employees will conform to the norm.

In addition to the above nudges, other potential nudges include the following: using different color flooring or walls to demarcate areas of potential safety risk, adoption of automatic safety features (e.g., automatic cutoff switches on machinery) that protect the employee without conscious efforts on their part, and workspace design to reduce access to hazardous areas (e.g., limited pathways to areas with hazardous materials or dangerous equipment). In addition to strengthening enforcement of current safety regulations, the implementation of simple nudges can help reduce the incidence of accidents and deaths in the agricultural sector.

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