



Idaho Economic Forecast

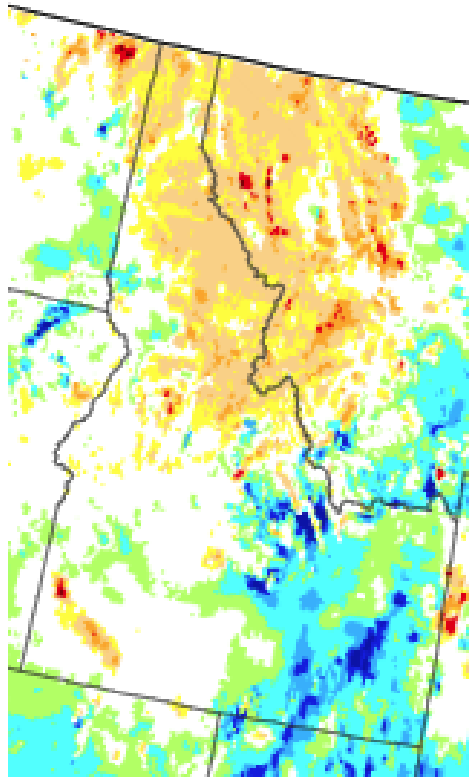
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- Forecast begins the first quarter of 2023
- Alternative forecasts



**Idaho
Economic
Forecast
2023–2028**

State of Idaho
BRAD LITTLE
Governor

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Introduction

This document summarizes Idaho's economic forecast for 2023 through 2028. The primary national forecast in this report is the April 2023 IHS Markit baseline forecast. IHS is now part of S&P Global. For the July forecast we plan to incorporate additional scenarios and data from Moodys' Analytics. The Idaho economic model takes the national forecast as an input.

Alternative assumptions concerning future movements of key economic variables can lead to major variations in national and/or regional outlooks. IHS examines the effects of different economic scenarios, including the potential impacts of global economic conditions, higher inflation, and future Federal Reserve Open Market Committee decisions. Alternative Idaho economic forecasts are developed under different policy and growth scenarios at the national level. Three of these forecasts are included in this report.

The Idaho Department of Labor provides monthly historical employment data that are then seasonally adjusted and converted to quarterly frequencies by DFM. For this report, historical data is complete through all of 2022.

The Idaho economic forecast has historically included an article from one of the Federal Reserve Banks. In this edition we continue to suggest that as an educational resource to readers. The relevant link is <https://www.frbsf.org/economic-research/publications/> for the Federal Reserve Bank of San Francisco. The bank provided its view of the economic outlook most recently on (March 9). The bank also provides understanding of current developments such as housing prices (March 27) and labor market tightness (February 27), among other interesting topics. These are among the many resources this publication references via pdf link.

Historical and forecast data for Idaho are available. These are now provided via [this link](#) within this pdf document.

Cover. The cover shows a screen capture from a National Oceanic and Atmospheric Administration (NOAA) website taken on April 26. It is a good indicator that there are many local conditions within Idaho. That pertains to the economy as well, obviously as the economy has both geographical as well as sectoral variation, but also in the very local sense in that each household lives in its own economy. This publication represents averages for Idaho's economy: average employment during the year, average annual wage, and average housing starts.

DFM is endeavoring to incorporate more data into its model to represent the distribution of the various metrics of interest. This includes a greater spread of wage rates by sector. These still remain averages, but they are averages in the sector, not across many sectors. As those incorporations take place, a fuller image of the Idaho economy will be available through this publication. While it will still pale in comparison to the detail afforded by the NOAA screenshot, we hope that it will provide a fuller picture of the Idaho economy.

Readers with any questions should contact Greg Piepmeyer or Matthew Hurt at (208) 334-3900 or via email using greg.piepmeyer@dfm.idaho.gov or matthew.hurt@dfm.idaho.gov.

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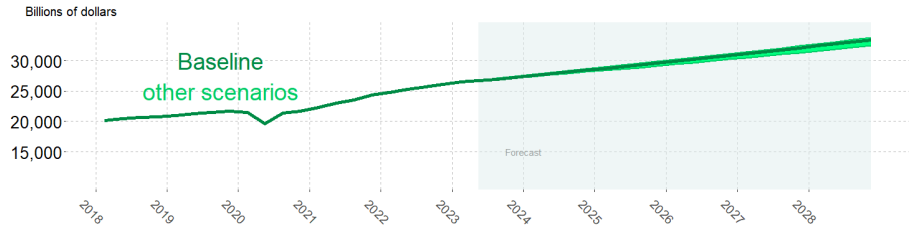
Summary

Among the easiest summaries to give for the US economy is Gross Domestic Product. We can look at this in nominal terms (that means not adjusting for inflation). We can also look at this in real terms (which means adjusting for inflation). In real terms, GDP is often quoted as a growth rate.

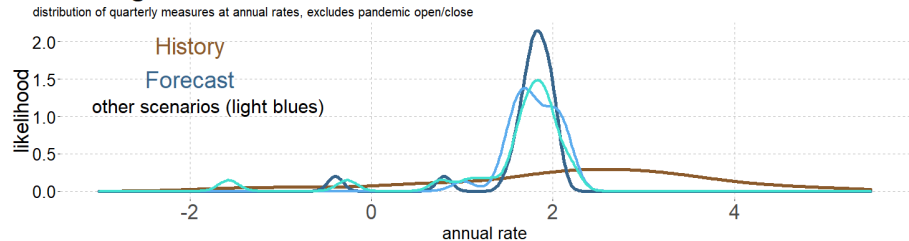
The expectation in terms of GDP is fairly modest in terms of growth rates. The expectation in nominal terms is fairly steady expansion.

Inflation remains elevated, which eats up some of the nominal gains in GDP, leaving real GDP growth rates more modest.

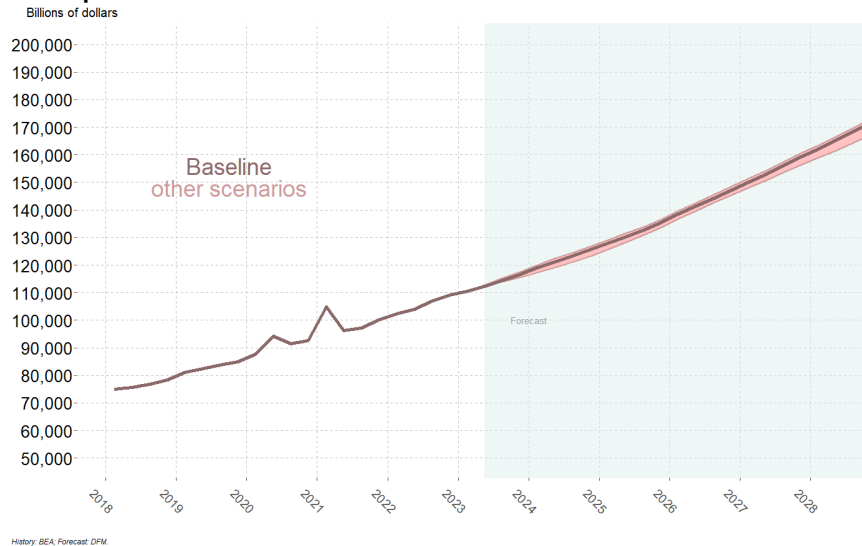
Nominal US GDP



Real GDP growth rates



Idaho personal income



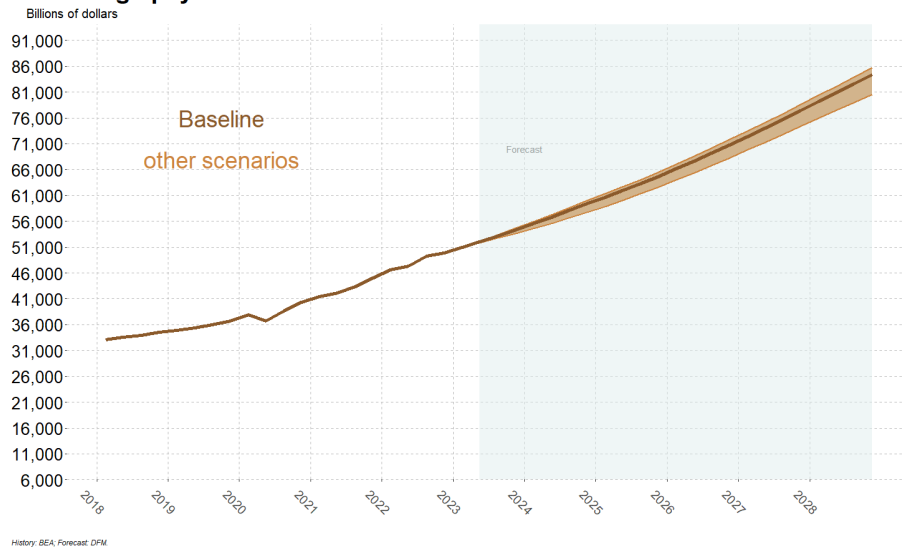
For Idaho, the easiest summaries of the economy are personal income and total wage payments. While these can be adjusted for inflation, just like GDP, the primary consumers of the information in this forecast work in nominal terms (i.e., in today's dollars). There are distinct spikes in personal income coming from transfer payments from the federal government to Idaho residents. The close of the

past year also saw a (somewhat smaller) influx of money from the government. The Bureau of Economic Analysis included the tax rebates from Idaho as part of personal income.

Another important metric in Idaho is total wage payments. These are a large portion of personal income. Growth of them reflects both growth of Idaho jobs as well as growth in wage

rates or hours worked. Idaho has benefited from the new Idahoans who are coming with jobs and who are bringing with them higher wages.

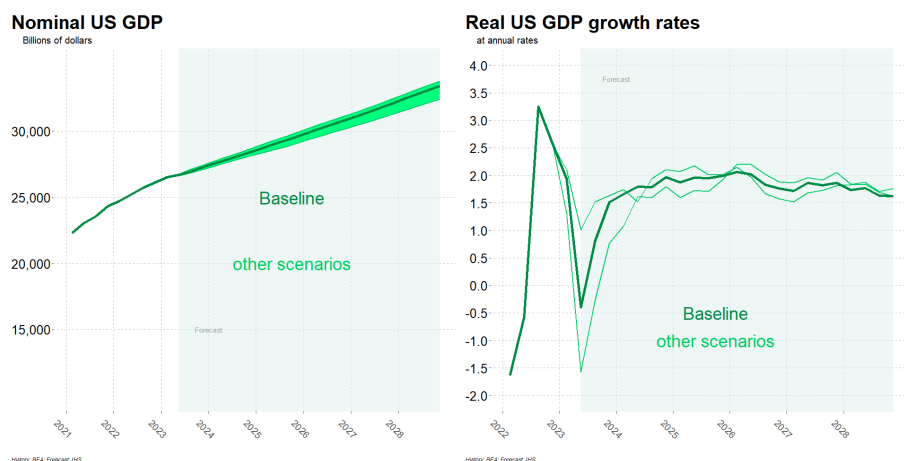
Idaho wage payments



Current economic conditions

Gross Domestic Product (GDP) is summary statistic from which it is difficult to escape discussing, particularly as the first quarter 2023 value was just released on April 27. According to the Bureau of Economic Analysis (BEA) real GDP increased 1.1 percent during the first quarter of 2023. Both IHS and the Atlanta Federal Reserve cut their forecast significantly in the days preceding the release (from 1.9 percent and over 2.5 percent, respectively), but a one percent expansion is far away from the 2 percent contraction IHS (in their October forecast release) predicted for the first quarter.

To account for inflation, typically GDP data is discussed in terms of real growth rates. Doing so, 2022 saw growth of 2.1 percent, while 2021 saw 5.9 percent after the 2.8 percent contraction recorded in 2020 (largely due to the pandemic). The growth rates forecast by IHS¹ for the near future are: 1.4 percent in 2023, 1.5 percent



in 2024, and then 1.8–2.0 percent each year in 2025–2028. Economic headwinds have been incorporated by IHS into their forecast; there is persistent sub-2 percent growth forecast for the next five years, which was not present in forecasts from a couple of years ago.

Real US GDP

IHS forecast	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
April '23	2.29	-2.77	5.95	2.06	1.45	1.46	1.91	1.97	1.81	1.76
January '23	2.29	-2.77	5.95	1.91	0.27	1.84	1.99	1.81	1.64	
January '22	2.29	-3.40	5.48	4.31	2.85	2.71	2.59	2.56	2.32	
January '21	2.16	-3.55	3.09	2.54	2.47	2.92	2.99	2.72	2.62	

For context, the International Monetary Fund IMF publishes its World Economic Outlook (WEO) for the major economies. It sees US growth at 1.6 percent in 2023, then 1.1 percent in 2024. These are lower than the IHS forecast. World growth is expected at 2.8 percent and 3.0 percent in 2023 and 2024, after having achieved 3.4 percent in 2022 according to their figures.

According to the BEA, at 4.9 percent, Idaho led the nation in real GDP growth in 2022. That was well above the national value of 2.1 percent. Idaho also led the nation in personal income growth at 6.2 percent and in earnings at 12.5 percent. Earnings are only comprised of wages

¹ in their April edition of their US forecast

and proprietors' income. Personal income also includes transfer payments, and three pieces of income coming from wealth: dividends, interest, and rent income.

Risks and momentum. External risks, such as Russia's invasion of Ukraine, or the possibility of US debt defaults or sequestration, are challenging to forecast since they turn on the whims of a small number of individuals or groups. IHS's stance, which we generally follow, is that these kinds of external risks will not materialize. They are not included in their baseline forecast.

There are also momentum factors in the economy: other economies continue to demand US goods and services as those economies expand. Inflation momentum also remains. Locally, the draw that Idaho has been for new residents is likely to continue, but the housing market's momentum is less clear.

International. Actions taken by international actors remain the primary source of external risk to Idaho's economic outlook. Among the visible ones, there is the war in Ukraine, tensions in the south-China sea, and the debt ceiling leading to a possible default by the US government. The general expectation, noted by IHS, is that Ukraine will wait to see how successful the expected Russian offensive and the planned Ukrainian counter-offensive will be before considering the notion of a negotiated peace. The two sides continue to pursue mutually exclusive goals which means the war, and its persistent drags on the global economy, appears here to stay.

China has stayed in the US news with a number of incidents ranging from spy balloons, to meetings between Taiwan's president and the US Speaker of the House, to meetings between European leaders and Chinese President Xi over the Chinese stance on the Russian-Ukrainian war. There have been a number of Chinese military drills taking place near Taiwan. There was also a military buildup along China's border with India.

Threats to Taiwan are particularly important for Idaho as Taiwan remains one of Idaho's largest trading partners. The relationship was significant enough for Taiwan to send a delegation to Idaho's capitol near the end of the most recent legislative session. Idaho's trade with Taiwan centers around agricultural products and semiconductors, two sectors in which Idaho employs a substantial number of workers. If Taiwan's ability to trade is threatened this could have adverse effects on Idaho's economy.

International developments can also be positive. One piece of GDP is the balance between exports and imports. Since exports add to GDP, higher than expected exports have consistently helped the country grow over the last several quarters. Among the larger exporting companies in the US are Boeing and General Electric, and both seem to indicate that the rest of the world still wants American goods.

In 2022, Boeing recorded 561 orders for 737 airplanes, 213 for the larger wide-body aircraft, and 78 orders for air freighters. Deliveries, in the same order, came in at 387, 93, and 44, respectively. Going forward, momentum continues. March 14 of this year saw \$37 billion in orders by Saudi Arabia, with orders for two sets of 39 aircraft, and options for up to 121 in that sale. March 3 saw the ordering of four copies of the 737 by Luxemburg and fifteen by Hong

Kong. On Valentines day, India ordered 190 of the 737s as well as 30 of the wide-body aircraft. The order by Saudi Arabia uses General Electric engines.

In addition to aviation, General Electric is involved in energy across the globe. It is constructing a high voltage DC conversion and line from wind farms in the North Sea of Germany to the Netherlands, Denmark, and Belgium, a contract the firm values at \$10 billion in its March 29 announcement. On February 16, it announced another phase in the Mangala hydropower plant upgrade. This plant produces 1 gigawatt (GW) of energy for Pakistan. In China, GE is also building pumped hydro-power storage facilities. China is aiming for 270 GW of pumped storage facility by 2025, and GE has delivered “more than 25 percent of the installed base in the country. [Additionally] In the world, more than 30 percent of hydro storage plants are equipped with GE technology.”

Total exports in 2022 for the US were recorded by the BEA just under \$3 trillion dollars.² Thus these two companies can and do register as > 1 percent of US exports. In fact, goods exports were just above \$2 trillion, while service exports topped \$0.9 trillion in 2022. The US economy as a whole recorded \$25.5 trillion in domestic product in 2022.

Export growth is expected to be 5.2 percent in 2023, then 4.9 percent in 2024, winding down to growth near 3 percent by 2028. In nominal dollars, exports are expected rise from the \$3 trillion dollar level of 2022 to almost \$4 trillion by 2028.

Since exports to several countries have been mentioned here, we give the IMF’s WEO outlook for those economies. Chinese growth is expected to hit 5.2 percent in 2023 and 4.5 percent in 2024 in their WEO. Pakistan is expected at only 0.5 percent in 2023, but 3.5 percent in 2024. India is expected at 5.9 percent and 6.3 percent those years. Saudia Arabia is seen hitting 3.1 percent each of those two years.

National. The US reached its debt limit, which is imposed by Congress. Consequently the US can not issue new debt in excess of debt which it retires: as bonds come due, the Treasury pays the interest earned and the principal due through ongoing revenue such as withholding income taxes if those funds are sufficient to do so, otherwise the Treasury borrows from internal funds. A short note on how the Treasury does this is provided by the [Treasury](#) itself.

Those bond pay-outs can be replaced by new treasury borrowing, but additional borrowing is prohibited by law. Existing obligations to current employes, citizens, and the military mean that such internal borrowing can only cover bonds coming due until sometime this summer. The amount of income tax collected in April will determine whether that date takes place in June or July. Beyond that, it is possible that the US Treasury would not be able to make bond payments when they are due, and such an event would be a default on the US debt.

IHS and most forecasters expect a settlement to be reached that avoids the federal government defaulting on its debt. [The Hill](#), a news source focused on the inner-workings of the federal government, gives a summary of the federal government’s flirtations with default on debt in the past. There would be significant short, medium, and long run consequences to a debt default of any kind.

²see table 3 of the final reading of [gdp4q](#)

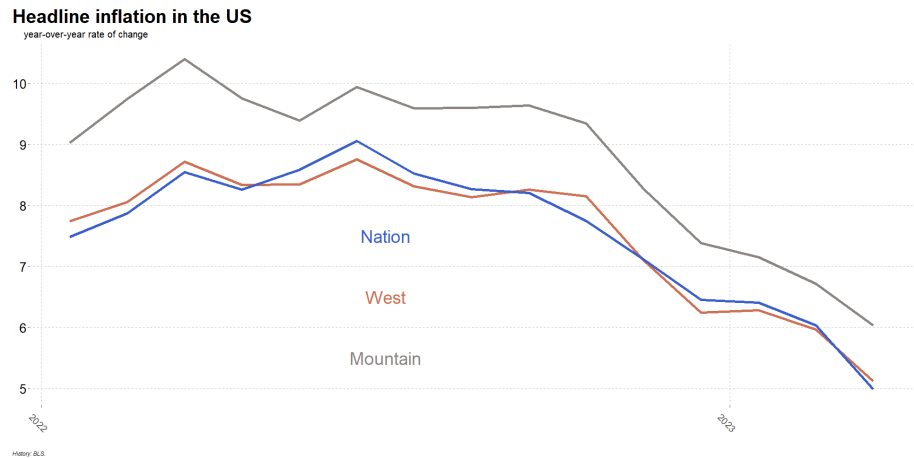
The inflation rate is measured by comparing the Consumer Price Index (CPI) in one month to its value from twelve months ago. Inflation fell significantly from 7.1 percent to 6.5 percent at the close of 2022. It stalled in January before falling to 6 percent in February and 5 percent in March. A similar trend holds for the seasonally adjusted rate as well as for the western census region and the mountain census division.

The figure charts the inflation rate since the peak inflation rate for the Mountain division was reached in March 2022. Inflation in the West has fallen to the national rate. Inflation remains high in the Mountain division. It likely remains high in Idaho. The gap was at its worst in March 2022 at 1.85 percentage points, improved

to 0.88 percentage points by June, before widening again to 1.6 percentage points in October. The gap had been shrinking since then, coming down to 0.68 percentage points before widening in March significantly to 1.05 percentage points.

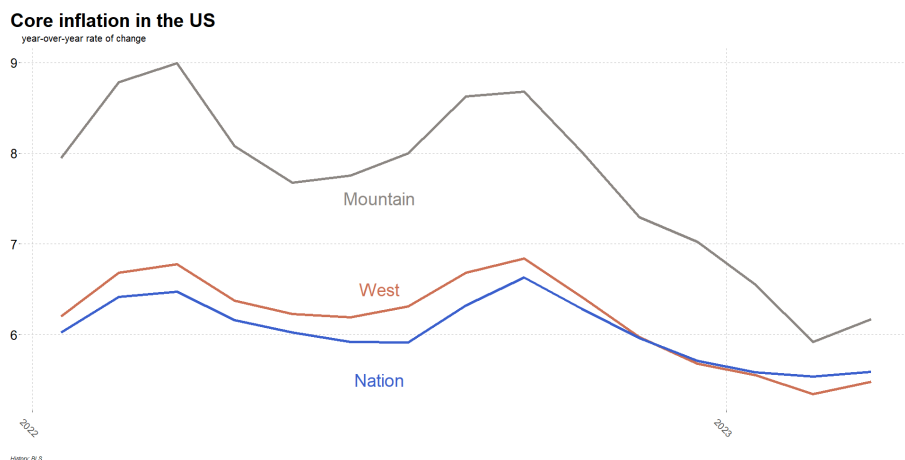
Core inflation, which excludes food and energy prices, has proven more stubborn. The figure on the next page plots core inflation for the three geographies (US, West, and Mountain areas) and shows that national inflation has only come down from 6.5 percent to 5.6 percent since March of last year. Since the Federal Reserve is more concerned with the core inflation rate (using a different, but somewhat teathered measure of core Personal Consumption Expenditures (PCE) inflation) the Federal Reserve is unlikely to ease rate hikes in the near future. IHS still expects the Federal Reserve to raise its target rate by an additional 25 basis points during their May meeting.

The gap in core inflation between the Mountain division and rest of the country has shrunk considerably since March 2022. At its peak the gap was 2.52, percentage points, likely reflecting inflation in housing costs and rent, before coming down to 0.38 percentage points in February and widening slightly to 0.58 percentage points in March. As the March BLS [news release](#) on CPI showed, shelter inflation has exceeded headline and core inflation, coming in over 8 percent compared to 5 and 5.6 percent, respectively. If housing costs continue to fall in the West, but stabilize or begin increasing during the summer in the rest of the country, then the gap between core and headline inflation may shrink for the Mountain division.



Local. Elevated inflation and interest rates impact Idaho families through housing. The all-transaction house price index for [Idaho](#) is among the many economic data sequences available

from the St. Louis Federal Reserve website. These data verify that Idaho had an acute increase in housing costs between 2020 and the summer of 2022.



To better understand this increase we consider the past since Idaho experienced a significant housing price boom in the 2000s. Between January 2004 and October 2006 the Idaho house price index increased more than 10 percent on an annualized basis. The index began a contraction in 2008 that lasted until 2011Q2 and

saw housing prices return to the level they were at in 2004Q4. Housing prices began to grow, with two quarters having growth above 10 percent on an annualized basis before prices reattained their pre-Great Recession peak in 2017Q1.

Among the thirteen consecutive quarters of 2017Q1 through 2020Q1, five of those quarters had annualized growth above 10 percent, demonstrating solid growth in housing prices. Then prices began to grow even faster than they had prior to the Great Recession. Starting in the summer of 2020, the state had two years of annualized growth in housing prices well above 10 percent. In fact, for the short period between January and April of 2021, home prices went up about 10 percent before annualization, which equates to a 50 percent annualized rate of price appreciation. This growth stalled between April and July of 2022, and then switched to reverse at a 14 percent annualized rate between July and October of 2022.

According to Redfin, a real estate brokerage, the median Idaho home price (for all home types) peaked in May 2022 at \$513,400. Since then, prices have come down to a March reading of \$435,400, which reflects a 15.2 percent decline in ten months. Year-over-year, prices are down 11.6 percent while the volume of homes sold is down 17.2 percent.

There is regional variation in home price trends. Redfin reports that housing prices are up in Twin Falls, Star, and Mountain Home, with year-over-year increases of 7.8 percent, 2.5 percent, and 2 percent respectively. However, price decreases are more common and typically more substantial, and they range from decreases of 2.8 percent in Eagle to 14.6 percent in Boise. IHS expects housing prices nationally to stabilize soon. It remains to be seen whether Idaho housing prices will take longer to stabilize due to their extraordinary growth over the last two years, or whether continued migration will buoy prices.

Housing prices and migration are inter-related. The direction of the relationship is not always clear. The lower costs of housing in Idaho certainly played a part in the uptick in migration the state has had since 2015. This migration in turn increased the demand for housing and pushed

prices up. More modest migration over the next few years may prevent the Idaho housing market from experiencing a crash similar to the one in 2008. This summer will teach us whether Idaho has reached a new normal regarding migration and housing prices. In any event, and this has been well telegraphed by the Federal Reserve through their press briefings, as housing prices fall we can expect headline inflation to continue falling.

Idaho Comparisons to US Average

Description	2014	2021	Change	Description	2014	2021	Change
Health Care	1.00	0.94	-0.06	Wholesale	1.07	1.05	-0.02
Retail	1.12	1.10	-0.03	Transport/Warehouse	0.88	0.85	-0.03
Food Processing	2.40	2.19	-0.22	Finance	0.81	0.80	-0.01
Wood Products	3.32	3.11	-0.21	Crop	3.31	2.61	-0.70
Paper	1.08	0.96	-0.12	Animal	8.58	7.42	-1.16
Printing	0.55	0.62	0.07	Logging	5.17	4.49	-0.69
Chemical	0.68	0.69	0.01	Hunting and Fishing	2.27	1.96	-0.30
Fabricated Metal	0.81	0.85	0.04	Other Agricultural	2.24	2.06	-0.18
Machinery	0.56	0.66	0.10	Other Service	0.81	0.86	0.05
Computer	2.39	1.89	-0.50	Recreation	1.00	1.19	0.19
Transportation	0.39	0.42	0.04	Real Estate	0.72	0.80	0.08
Other	0.59	0.65	0.06	Education	0.50	0.59	0.09
Food Service	0.96	1.06	0.10	Information	0.73	0.51	-0.22
Construction	1.20	1.43	0.23	Management	0.55	0.61	0.06
Administrative	1.03	0.98	-0.04	Utilities	1.15	1.03	-0.12
Professional	0.82	0.84	0.01	Mining	0.62	0.99	0.37

note: 1 is parity; above 1 records higher Idaho weight, below 1 records lower Idaho weight

Idaho Labor Market Composition³ We have not recently provided a comparison between Idaho’s labor market allocation and the nation’s. Understanding these existing differences provides context when we forecast Idaho’s labor market. For example, in the health care sector and its employment: is Idaho catching up to the national allocation, or diverging from it?

Idaho is an agricultural state. What may surprise some, but is consistent with trends over the last few decades, is that Idaho is a dairy state. By far the greatest difference between the Idaho and national labor markets is our allocation to animal products. Even though animal products only made up 1.8 percent of Idaho’s labor market in 2014 it was still several times greater than the national average of 0.2 percent. While these differences are stark, the gap shrunk between 2014 and 2021 as Idaho’s non-agricultural employment increased faster than its agricultural employment.

Idaho’s largest sector, health care, failed to grow as quickly as it did nationwide. In 2014 Idaho’s labor market allocation to health care was virtually identical to the nation’s, but by 2021 Idaho’s share had fallen to 15.2 percent even as the national share had increased to 16.2 percent. It should not be a surprise that stories about health care worker shortages in Idaho

³ Our primary source for sectoral employment and wages comes from the quarterly Census of Employment and Wages (CEW). These data include 90 percent of Idaho’s workforce and give us the ability to consistently compare employment across different sectors of the economy both across time and between Idaho and the United States.

routinely feature in the news. Health care employment in Idaho has failed to keep pace with national trends. Health care was one of seven sectors of the economy that diverged away from the national average between 2014 and 2021.

Other sector of note include food service and recreation, areas that Idaho is now overexposed to, although this is likely temporary and due to our fast pandemic recovery in comparison with the sluggish recovery in those sectors nationally. Growth in finance and transportation/warehousing was modest compared to the rest of the country. Indeed, these remain areas Idaho's economy is underexposed to compared to the rest of the nation. Idaho was overexposed to construction in 2014 and even more so in 2021. However, this is likely a product of Idaho's rapid population boom, which increases the demand for construction in housing and infrastructure.

Shares of Idaho's Labor Market

Description	2014 %	2021 %	Change	Description	2014 %	2021 %	Change
Health Care	15.47	15.21	-0.26	Wholesale Trade	5.36	4.87	-0.49
Retail	14.93	13.74	-1.19	Transport/Warehouse	3.33	4.13	0.80
Food Processing	3.09	2.91	-0.18	Finance	3.96	4.00	0.05
Wood Products	1.06	1.04	-0.02	Crops	1.60	1.17	-0.43
Paper	0.35	0.28	-0.07	Animal	1.82	1.60	-0.22
Printing	0.22	0.19	-0.02	Forestry	0.25	0.19	-0.06
Chemical	0.47	0.49	0.02	Hunting and Fishing	0.02	0.01	0.00
Fabricated Metal	1.01	0.95	-0.06	Agriculture Other	0.71	0.64	-0.07
Machinery	0.54	0.57	0.03	Other Service	2.97	2.90	-0.07
Computer	2.16	1.62	-0.54	Recreation	1.81	1.92	0.11
Transportation	0.53	0.57	0.05	Real Estate	1.28	1.46	0.18
Other Manufacture	1.78	1.88	0.10	Education	1.16	1.37	0.21
Food Service	10.46	10.51	0.05	Information	1.72	1.19	-0.53
Construction	6.34	8.48	2.14	Management	1.03	1.17	0.14
Administrative	7.61	7.27	-0.35	Utilities	0.55	0.46	-0.09
Professional	5.96	6.76	0.80	Mining	0.45	0.42	-0.03

Looking across recent history, the largest sector in 2014 and 2021 was health care, which comprised more than 15 percent of Idaho's labor market. Retail was the next largest sector, although it had the largest decline—more than one percentage point—going from 14.9 percent to 13.7 percent. Manufacturing also declined between 2014 and 2021, going from 11.2 percent to 10.5 percent, with most of the decline coming from computer manufacturing. The largest gains were in construction going from 6.3 percent to 8.5 percent and transportation and warehousing, going from 3.3 percent to 4.1 percent.

Economic outlook

IHS has leaned more on its weekly economic commentary to color the numerics of its US forecast. Starting April off, the firm highlighted its pessimism while acknowledging that the current conditions are not at all dire. IHS saw that the US economy is “exhibiting decent forward momentum, but there are signs that momentum is slowing,” while noting that “aggregate hours worked fell for the second month in [a] row, albeit from a level that soared in January.” One week later, their mid-month opening comment was: “This week’s data on consumer spending and industrial production for March (and including revisions to prior months) were above our expectations.” They followed this by summarizing with “Over the week, financial markets seemed to catch up to our view that the first quarter will show solid growth, while the sticky inflation data support expectations for another Fed rate hike” beyond the one enacted on March 22. By the third week of April, the firm said (first person) “we left our estimate of first-quarter real GDP growth unrevised at 1.9 percent. . . . We expect that, following a second-quarter pause, GDP will resume growing in the third quarter. . . . With nothing to suggest a material shift of the economy’s momentum this week . . .” Thus, it seems that the economic momentum that the firm acknowledged was there during March continued through the majority of April. The GDP pause that the firm sees⁴ in the second quarter is really just that: 0.0 percent change, neither growth nor contraction.

US growth rates	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
US nonfarm jobs	1.34	-5.79	2.9	4.34	1.97	-0.03	0.14	0.43	0.46	0.45
US population	0.55	0.38	0.19	0.39	0.47	0.5	0.52	0.52	0.51	0.51
Total personal income	5.11	6.7	7.37	2.41	5.25	4.69	4.59	4.6	4.65	4.56
... inflation adjusted ...	3.56	5.54	3.26	-3.67	1.29	1.96	2.43	2.62	2.58	2.46
Wage & salary payments	4.77	1.42	8.81	9.07	6.43	4.4	4.37	4.48	4.52	4.36
... average US wage ...	3.39	7.77	5.61	4.55	4.39	4.44	4.23	4.04	4.04	3.89

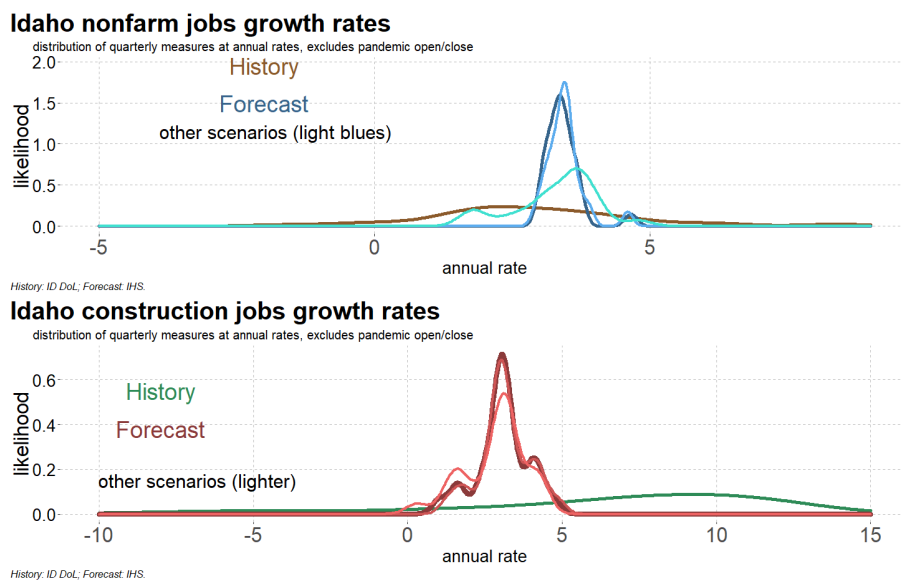
ID growth rates	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
ID nonfarm jobs	2.95	-0.06	5.03	3.71	2.68	3.22	3.27	3.56	3.46	3.63
ID population	2.11	3.28	2.88	2.42	1.33	1.48	1.75	1.75	1.63	1.54
ID personal income	8.63	10.14	8.86	6.08	7.4	7.85	7.54	8.61	8.29	7.96
... inflation adjusted ...	7.03	8.95	4.7	-0.24	3.36	5.04	5.31	6.55	6.15	5.8
Wage & salary payments	5.73	7.41	11.96	12.24	9.06	9.14	9.01	9.27	9.41	9.25
... average wage ...	3.4	7.03	6.74	8.62	6.27	5.84	5.66	5.66	5.89	5.56

Within Idaho, economic momentum is also present. It is easily visible within the Treasure Valley, where construction cranes have been up in Garden City, on the Boise bench, just west of Boise State University, and several in downtown Boise. Idaho Transportation Department

⁴April 20 release by IHS of its GDP tracker

projects on [I-84](#) include new interchanges and bridge resurfacing opening this summer in the Nampa and Caldwell areas. There are further projects on the [I-15](#) corridor which are in the design phases, with construction to follow in the next few years, though there is also plenty of ongoing work on [I-15](#) and [I-86](#). That ongoing work is using a large conveyor system in lieu of relying on short-haul trucking to move significant amounts of earth around the site. At the northern end of the state [I-90](#) and [SH-41](#) are in the middle of a three-year interchange rebuild. Several of these project are funded in part by the extra monies sent towards transportation from the sales tax revenue stream.⁵

Large projects such as these do indeed possess significant momentum. For road projects, funding is secured sometimes by local bonding, sometimes from federal dollars, and certainly runs in the (sometimes tens of) millions of dollars. For the apartment buildings, funding is private, but it is significant. In all of these cases, the planning phases of these projects can be years in the making.



Housing starts and construction. Housing construction can be of the same sort — a major project with significant planning and financial resources. Indeed, that holds for the apartment buildings using these construction cranes. Housing construction, though, can also be more piecemeal. Once a subdivision has its roads set, individual houses can be constructed at different points of time, with differing lengths of construction, on different construction loans. In some ways, the effects of any economic slowing are easier to see, through physical visits to construction sites for the single-family housing sector, than similar visits to multi-family construction sites. However, both sectors reveal where the economy may be heading through their permit numbers; permits are pulled before construction begins, and so are forward-looking, suggesting where the economy is heading rather than just where it has been.

In terms of permits, Idaho's single-family housing has slowed from near 1,500 units per month in early spring of 2021 to well below 1,000 permits per month in 2023. For multi-family construction of buildings with at least five housing units, the change has been from the occasional month of 300 units permitted with other months often nearer to 100 units permitted, to the reverse situation, where 300 units permitted per month is common, and occasionally there will

⁵ Further details on state funding of these projects can be read through the earlier links within the paragraph.

be more than 500 units permitted per month. This fits with the national outlook. IHS’s commentary on US housing from their March outlook is: “With profit margins shrinking (or in the red)⁶, builders will continue to scale back on starting new single-family homes” and the firm also expects that “multifamily starts will also come down soon,” too. They point out that rents are “easing” and they also note that at “949,000 units under construction, recent levels [of investment in multi-family housing units] are unsustainable.” In their third-week of April commentary, IHS noted that March housing permit data for the nation showed:

... the second consecutive increase following declines over every month since last February. Over that span, single-family permits declined 482 thousand. Even with the increases over the last two months, permits are down 386 thousand (-32.1 percent) from their recent peak.

Substantiating their view that builders will scale back their ambitions were the following points regarding sales of existing homes, which showed some improvement in February over January:

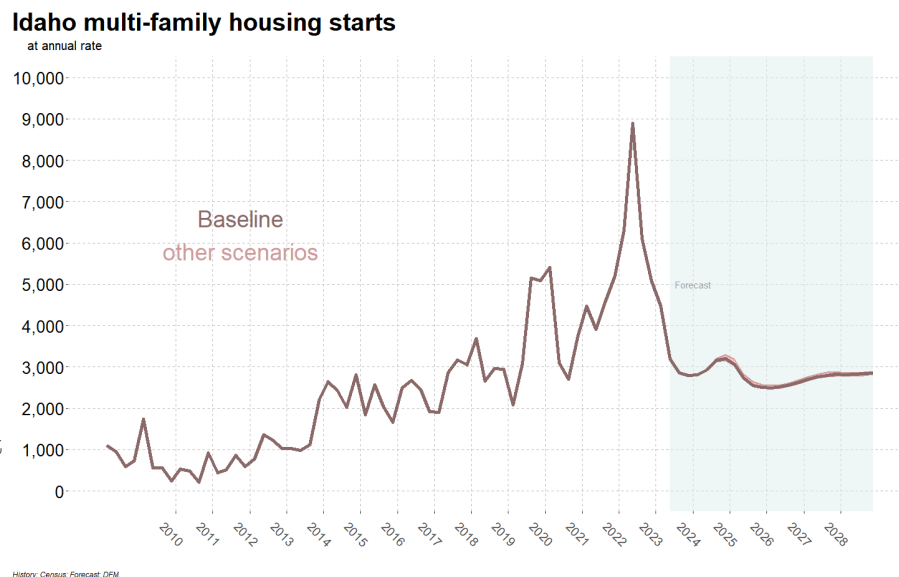
The increase in February followed declines over 13 of the prior 14 months. Over that span, existing home sales declined 37.1 percent, reaching their lowest level since 2010. Even with the cumulative increase of 440 thousand over the last two months, existing home sales are 30.2 percent below their recent (November 2021) peak.

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
US	% growth	3.50	8.06	15.06	-3.21	-16.74	2.03	6.75	-0.69	-1.20	-0.17
	single units	888,600	1,001,900	1,131,100	1,006,900	812,300	918,200	982,100	977,500	965,700	964,100
	multi units	402,400	393,200	474,100	546,800	481,300	401,700	427,000	421,900	416,900	416,300
ID	% growth	4.89	8.63	14.26	0.86	-32.36	7.65	-2.95	0.05	3.28	1.23
	single units	13,000	14,600	16,400	13,800	10,800	12,400	12,200	12,400	12,700	12,800
	multi units	3,900	3,700	4,500	6,600	3,300	3,000	2,700	2,600	2,800	2,800
	% growth	2.07	2.14	2.41	2.06	1.88	1.81	1.80	1.79	1.79	1.79
	stock	754,600	770,700	789,300	805,500	820,700	835,600	850,600	865,900	881,400	897,200

Total housing unit starts in Idaho are expected to return to the 2018 levels. They are recording that as of the first quarter of 2023. Not much variation is expected before the end of 2028 in this forecast. Typically 80 percent of housing starts have been single-family in Idaho since 2010. Many ongoing multi-family housing starts have already begun — meaning that there will be many completions of multi-family housing units across the near-term. The last three quarters of data on multi-family housing starts indicates that they are falling from their mid-summer 2022 peak (having fallen by roughly half) and the model still has these expecting to retreat a bit more. However, multi-family housing starts are expected to also land in the vicinity of the 2018 level of activity for the state.

⁶ Other commentary on profitability of building from IHS included: “The median selling price fell 1.0 percent over the 12 months ending in March, the first decline since February 2012 and well below the peak 12-month increase of 25.2 percent in May 2021. ”

In our prior edition of this report we indicated: “Construction employment is expected to show year-over-year growth rates similar to total nonfarm employment across the bulk of the forecast, even though it has outshone total nonfarm jobs frequently since 2013.” That still remains. Mean and median growth rates for construction are very near



(annually in low-to-mid 3 percents) those for nonfarm employment in the state as a whole across the forecast horizon. This contrasts with construction running at 2 to 3 *times* the growth rate of all nonfarm jobs in recent history.

Retail trade. In their mid-April weekly commentary, IHS related that “consumer spending came out of the gates very fast in 2023.” As noted earlier, consumer spending in March was stronger than IHS had been expecting, and IHS also noted that credit-card transaction volumes in early April suggest that the American consumer is spending. That spending, though, may no longer be over-the-top. In its March outlook, IHS noted that “The personal saving rate edged up 0.2 percentage point to 4.7 percent, and has risen steadily after falling to 2.7 percent in June.” Consumption grew 12.7 percent in 2021, 9.1 percent in 2022, and IHS forecasts consumption to grow by 5.9 percent in 2023 and 3.9 percent in 2024. IHS forecasts the savings rate to continue to climb, reaching 5.9 percent in 2024, 6.7 percent in 2025, 7.1 percent in 2026, and then holding in the mid-7 percent area across the forecast horizon.

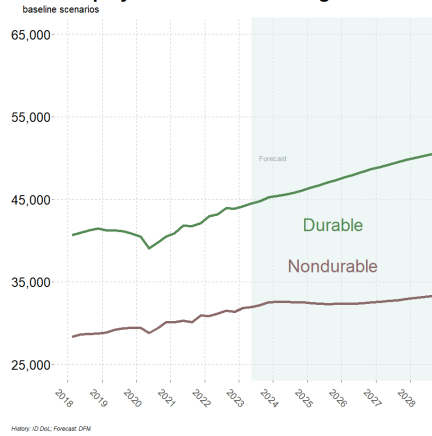
The composition of spending is expected to tilt away from goods towards services, continuing a recovery trend. Durable goods grew 25.1 percent in 2021, 6.1 percent in 2022, but is expected to grow only 0.7 percent in 2023 before a one-year contraction of 1.3 percent in 2024, with growth of 1.5 percent in 2025, and then mid-2 percent growth thereafter. Nondurable goods grew 13.7 percent in 2021, 9.3 percent in 2022, and are expected to grow 2.7 percent in 2023, 1.8 percent in 2024, then mid-to-high 2-percent thereafter. Service growth grew 10.2 percent in 2021, 9.7 percent in 2022, and is expected to grow 8 percent in 2023, 5.5 percent in 2024, then near-5 percent per year across the remainder of the forecast.

The outlook in Idaho for manufacturing in these two sub-sectors does not quite adhere to the IHS view. Idaho’s manufacturing is concentrated in food products and paper products for nondurables, and in semi-conductors, food processing equipment, and ammunition for durable goods.

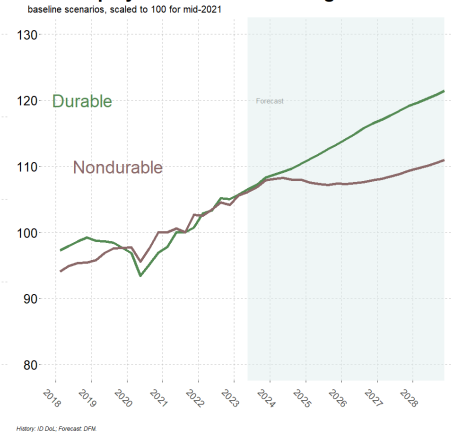
Despite these consistent growth trends in sales, IHS generally has a pessimistic outlook for the retail trade sector in terms of employment. It shrank 4.7 percent in 2020, grew 3 percent in 2021, 1.5 percent in 2022, and is projected by the firm to be flat in 2023 before declines set in. The expected contractions in retail employment are: 3.9 percent in 2024, 3.6 percent in 2025, 1.1 percent in 2026 and declines of 0–1 percent in each of 2026–2029. IHS did note that its retail employment classification was updated in March to the 2022 North American Industrial Classification System codes (NAICS) from the 2017 edition of NAICS. This change involved assigning internet retailers to existing retail categories. Also visible within the March update, IHS expects a rebound in productivity in 2024 and 2025 after a couple of years of declining productivity. Indeed, that aspect of the US economy is expected to resemble the values attained in 2017–2018 across much of the forecast horizon, making the swings across 2020–2023⁷ appear to be an anomaly.

Retail has been falling as a percentage of all nonfarm jobs in Idaho since 2000. The decline is from 13 percent of nonfarm jobs then to closer to 11 percent of nonfarm jobs now. The pandemic shutdown did boost the sector as a percentage of nonfarm jobs. Recall that grocery workers were on-the-job throughout the pandemic. The outlook across the forecast horizon does not see much change in the percentage of nonfarm jobs that retail occupies in Idaho. That means that we are expecting for retail jobs to also parallel total nonfarm jobs in terms of the forecast horizon.

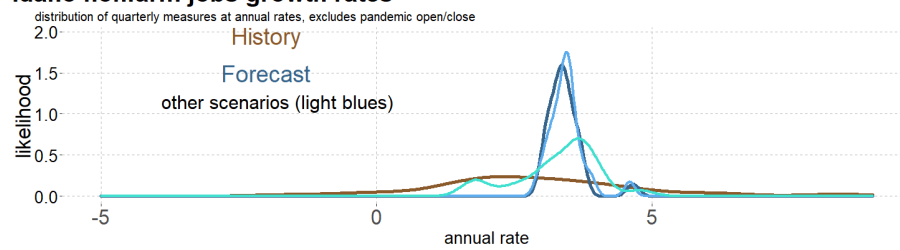
Idaho employment in manufacturing



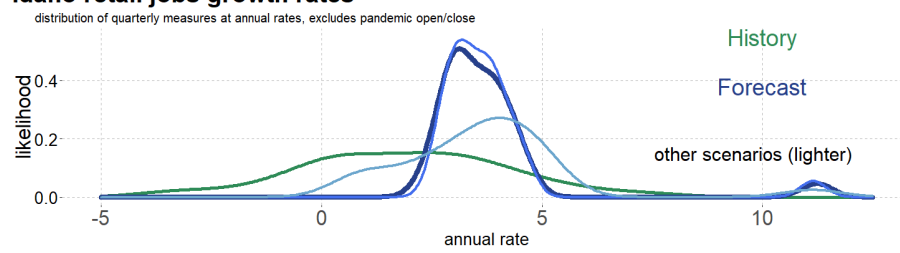
Idaho employment in manufacturing



Idaho nonfarm jobs growth rates



Idaho retail jobs growth rates



⁷productivity changed: +4.4 percent, +2.2 percent, -1.7 percent -0.3 percent, respectively

Forecast analysis

Forecast comparison. In our prior report, we noted that

IHS takes the Fed at its word that it ‘is determined to slay inflation, which could take a few years. The Fed will not begin to lower interest rates until inflation has declined substantially — to roughly 2.5 percent — and there is a high degree of confidence that it will fall [further] to 2 percent. Those conditions are met in our forecast in 2024.’

It may be that the firm is pushing back its expected arrival of inflation consistent with the 2-percent objective of the Fed. The firm now says “core PCE [personal consumption expenditure] inflation is expected to return to about 2 percent in late-2025.” PCE inflation is the gauge, produced by the US Bureau of Economic Analysis, which the Federal Reserve (Fed) uses to measure its objective of price stability for the US economy.

Our prior edition also noted that single-family housing permits had slowed and the multi-family housing permits had picked up some of the slack. Data since then have continued along similar lines. Single-family housing starts continue to run slower than they have a year to two years ago, and multi-family housing permits still show numbers which are historically quite aggressive, though well off their mid-2022 peak.

The March data for Idaho showed a labor force just above 960 thousand, with over 935 thousand in employment, putting the unemployment rate at 2.6 percent. This last rate is similar to the 2.5 percent from one year ago. Looking across that year, Idaho added 14 thousand people to the labor force and over 13 thousand people to the employment rolls. Data such as these can be found within the Idaho Department of Labor (DoL), particularly their [data and tools](#) webpage. Idaho DoL runs several programs in conjunction with the Bureau of Labor Statistics (BLS). BLS programs include a mixture of survey and census (i.e., administrative records) tools. For example the latest Current Economic Situation (CES) survey report shows nonfarm employment at almost 836 thousand, up from the year-ago level of 816 thousand. Though those numbers differ from total employment (indeed, they are labeled as nonfarm jobs in the CES), the fact that significant growth in Idaho employment has occurred in the past year remains visible in this DoL output as well.

Another BLS measure of the labor market is the Local Area Unemployment Statistics (LAUS) program. From March 2022 through March 2023, this program showed Idaho employment increasing from 822,100 to 846,600, a yearly employment gain of 24,500. The March report⁸ shows these values (in [table E](#)). The unemployment rate comes from this program.

The prior edition of this report rested upon employment figures only through mid-2022 in Idaho. Now we have CEW data through the close of 2022 thanks to the Idaho Department of Labor, though it may take a while for the BLS to update its data retrieval tool.⁹ We likewise have quarterly data through the close of 2022 for personal income coming from the US Bureau of Economic Analysis (BEA).

For each of the prior forecasts (ending in 2027), the year 2022 was not yet in the history books. This April forecast has data on 2022. The four figures in the table are fairly stable across the

⁸ released on April 21

⁹ DFM uses Census of Employment and Wages (CEW) [data](#), which is unemployment insurance based, not survey based, for the forecast input.

Jul'22 ed.	2022	2023	2024	2025	2026	2027	
Personal inc. \$ m	103,589	109,924	117,180	124,772	132,623	140,967	
Wages \$ m	48,628	52,060	55,565	59,521	63,677	68,080	
Population ct	1,945,563	1,973,689	2,004,537	2,036,370	2,067,100	2,095,760	
Nonfarm jobs	827,248	847,279	869,347	892,805	915,118	936,796	
Oct'22 ed.	2022	2023	2024	2025	2026	2027	
Personal inc. \$ m	104,848	111,323	119,006	126,878	136,249	145,624	
Wages \$ m	48,051	51,175	54,476	58,592	63,101	67,812	
Population ct	1,940,875	1,969,872	1,997,162	2,028,559	2,061,220	2,091,619	
Nonfarm jobs	829,085	849,597	871,377	895,826	922,507	948,427	
Jan'23 ed.	2022	2023	2024	2025	2026	2027	
Personal inc. \$ m	104,297	111,079	118,823	126,772	136,206	145,800	
Wages \$ m	47,742	50,907	54,370	58,500	62,946	67,647	
Population ct	1,940,750	1,969,631	1,997,337	2,029,132	2,062,106	2,093,037	
Nonfarm jobs	826,985	849,441	871,932	897,305	924,855	951,845	
Apr'23 ed.	2022	2023	2024	2025	2026	2027	2028
Personal inc. \$ m	105,600	113,414	122,319	131,537	142,865	154,709	167,023
Wages \$ m	48,252	52,624	57,431	62,606	68,412	74,849	81,771
Population ct	1,946,916	1,972,797	2,001,989	2,036,939	2,072,509	2,106,271	2,138,801
Nonfarm jobs	827,797	850,015	877,421	906,132	938,385	970,887	1,006,113

editions of the forecast for 2022, and to a degree, for the remaining years where comparisons can be made. Note that Idaho's population is still expected to cross above 2 million individuals somewhere in the middle of this forecast horizon, and also note that 1 million nonfarm jobs is starting to become a possibility within the forecast horizon.

It is also important to indicate that these forecasts are not prescriptions. From our current vantage of early-to-mid-2023, the years 2027 and 2028 are about as far away as 2018 is. While the tax cuts and jobs act (TCJA) of the prior administration was a large change, it turns out that other large changes would dwarf it within a few years. For economic forecasts of this duration, it is important to view the later years as guides. A lot will change en route to those times, but were the current economic momentum to persist, these are the types of figures one could expect.

There are perhaps two rules of thumb to consider from these forecasts. Note that wages are roughly half of personal income in the state, and that nonfarm jobs are also about half of total population in the state. Looking more closely, both are ratios are increasing towards that half-way mark. Wages were 44 percent of personal income in 2018, they have reached mid-45 percent in 2022, and they are expected above 48 percent at the close of 2028. Similarly, nonfarm jobs were 42 percent of Idaho's population in 2018, they have moved up only slightly to 42.5 percent in 2022, but they are expected above 46 percent by the close of the forecast horizon.

IHS sets its baseline, pessimistic, and optimistic forecasts to indicate reasonably likely economic outcomes. Baseline assumes current economic and policy conditions. Pessimist takes into account some possible, negative shocks. Optimist takes into account some possible, positive shocks. IHS scenarios are not exhaustive, but rather indicative.

Summary statistics are presented in the table. Two years of history are given, along with the forecast years (2023–2028). All three alternatives agree across history, but they diverge beginning in 2023. The history does provide some context for the changes envisioned in the three main IHS alternatives.

Idaho		2021	2022	2023	2024	2025	2026	2027	2028
Nonfarm jobs	baseline	798,166	827,797	850,015	877,421	906,132	938,385	970,887	1,006,113
	optimistic	798,166	827,797	851,664	880,259	909,629	941,460	973,341	1,008,125
	pessimistic	798,166	827,797	846,713	865,022	893,075	927,729	962,424	998,527
Wages, m \$	baseline	42,992	48,252	52,624	57,431	62,606	68,412	74,849	81,771
	optimistic	42,992	48,252	52,782	57,922	63,370	69,368	75,955	83,028
	pessimistic	42,992	48,252	52,281	56,116	60,681	66,084	72,008	78,266
Housing starts	baseline	20,956	21,135	14,296	15,390	14,936	14,944	15,434	15,625
	optimistic	20,956	21,135	14,286	15,278	14,839	14,848	15,376	15,590
	pessimistic	20,956	21,135	14,349	15,522	15,466	15,436	16,079	16,270

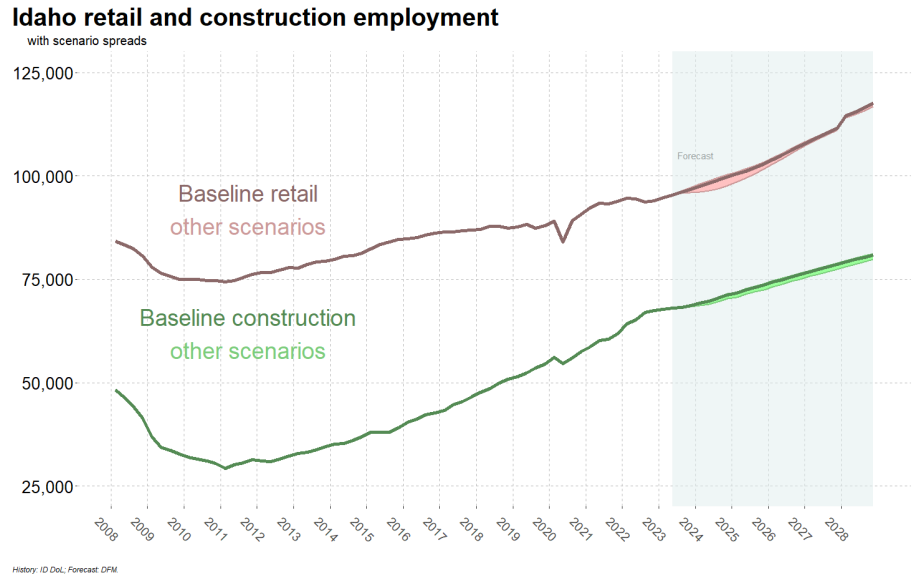
Alternative forecasts. As has been the case for some time, IHS scenarios often concentrate the optimistic and the baseline almost to the same trajectory. The pessimistic case does deviate more substantially, but only for a while, then it takes up a parallel trajectory to the other cases. Practically, this means that the scenarios often have minor changes in store for Idaho’s outlook, with the primary exception being in terms of the housing sector.

That description applies to GDP and consumer spending for the US economy under IHS’s alternatives, but it does not apply to the unemployment rate or light-vehicle (car and truck) sales. Unemployment for the baseline and the optimistic cases gently rises to the mid-4 percent level, but it elevates well above 6 percent in the pessimistic case, and remains above 5 percent for at least five years in that case. Vehicle sales climb above 15 million units and continue a gentle expansion in the baseline and optimistic cases, but they fall and then stay flat near 12.5 million in the pessimistic case. That different trajectory for vehicles may be partly explained by a differing outlook on crude oil prices: they are 15–20 dollars per (42 gallon) barrel more dear in the pessimistic scenario than the others. While higher oil prices may affect employment some, IHS notes that the driving force in the pessimistic case is tightening lending standards by main-street lenders leading to less consumer spending along with the less robust jobs market. Indeed, forcing through an oil price shock in the IHS model did not induce the baseline unemployment rate to adhere to the pessimistic trajectory.

In Idaho, housing starts do deviate, but only by mid-2025 in a meaningful manner. Retail employment and construction employment both end the forecast horizon not materially affected

by which scenario unfolds. Retail does have the pessimistic case visible by mid-2023 through mid-2026, but the gap closes thereafter. Construction has a minor gap open by mid-2024, and that gap persists. In a sector with employment near 67 thousand jobs, this amounts to 200–300 more jobs in the optimistic case, and 400–1,000 fewer jobs in the pessimistic case.¹⁰ For retail, the difference is 600–250 jobs more in the optimistic case, and 2,000–600 fewer jobs in the pessimistic case. Retail’s current employment level is 94 thousand jobs.

Finally, in term of housing, the differences are minor upside (100 extra units) and a bit more significant on the downside (600 fewer units).



¹⁰ For these sentences, the ranges are stated so that XX–YY represents the changes XX for early in the forecast and YY for later in the forecast.

Appendix

i. US Economic Model by IHS Markit

IHS Markit (IHS) Macroeconomic Model is a multiple-equation model of the US economy. Consisting of over 1,200 equations, the model is solved in an iterative manner to generate the results of different policy and forecast scenarios. The model incorporates the best insights of many theoretical schools of thought to depict the economic decision processes and interactions of households, businesses, and governments.

The IHS model is divided into the following eight major sectors:

- (1) **Private domestic spending**
- (2) **Production and Income**
- (3) **Taxes**
- (4) **International**
- (5) **Financial**
- (6) **Inflation**
- (7) **Supply**
- (8) **Expectations**

- (1) **Private Domestic Spending.** Major aggregate demand components include consumption, investment, and government. Consumer purchases are divided among three categories: durable goods, nondurable goods, and services. In nearly all cases, real expenditures are influenced by real income and the relative price of consumer goods. Durable and semi-durable goods are also sensitive to household net worth, current finance costs, and consumer sentiment.

IHS divides investment into two general categories: fixed investment and inventories. The former is driven by utilization rates, capital stock, relative prices, financial market conditions, financial balance sheet conditions, and government policies. Inventory investment is heavily influenced by such factors as past and present sales levels, vendor performance, and utilization rates.

The government sector is divided into federal government and state and local government. Most of the federal expenditure side is exogenous. Federal receipts are endogenous and divided into personal taxes, corporate taxes, indirect business taxes, and contributions for social insurance. State and local sector receipts depend primarily on federal grants and various tax rates and bases. State and local government spending is driven by legal requirements (i.e., balanced budgets), the level of federal grants (due to the matching requirements of many programs), population growth, and trend increases in personal income.

- (2) **Production and Income.** The industrial production sector includes 74 standard industrial classifications. Production is a function of various cyclical and trend variables

and a generated output term, i.e., the input-output (I-O) relationship between the producing industry and both intermediate industries and final demand. The cyclical and trend variables correct for changes in I-O coefficients that are implied by the changing relationship between buyers and sellers.

Pre-tax income categories include private and government wages, corporate profits, interest rate, and entrepreneurial returns. Each of these categories, except corporate profits, is determined by some combination of wages, prices, interest rates, debt levels, capacity utilization rate, and unemployment rate. Corporate profits are calculated as the residual of total national income less the nonprofit components of income mentioned above.

- (3) **Taxes.** The model tracks personal, corporate, payroll, and excise taxes separately. Tax revenues are simultaneously forecast as the product of the rate and the associated pre-tax income components. The model automatically adjusts the effective average personal tax rate for variations in inflation and income per household, and the effective average corporate rate for credits earned on equipment, utility structures, and R&D. State taxes are fully endogenous, except for corporate profits and social insurance tax rates.
- (4) **International.** The international sector can either add or divert strength from the central flow of domestic income and spending. Imports' ability to capture varying shares of domestic demand depends on the prices of foreign output, the US exchange rate, and competing domestic prices. Exports' portion of domestic spending depends on similar variables and the level of world gross domestic product. The exchange rate itself responds to international differences in inflation, interest rates, trade deficits, and capital flows between the US and its competitors. Investment income flows are also explicitly modeled.
- (5) **Financial.** The IHS model includes a highly detailed financial sector. Several short- and long-term interest rates are covered in this model, and they are the key output of this sector. The short-term rates depend upon the balance between the demand and supply of reserves in the banking system. The supply of reserves is the primary exogenous monetary policy lever within the model, reflecting the Federal Reserve's open market purchases or sales of Treasury securities. Longer-term interest rates are driven by shorter-term rates as well as factors affecting the slope of the yield curve. These factors include inflation expectations, government borrowing requirements, and corporate finance needs.
- (6) **Inflation.** Inflation is modeled as a controlled, interactive process involving wages, prices, and market conditions. The principal domestic cost influences are labor compensation, nonfarm productivity, and foreign input costs that later are driven by the exchange rate, the price of oil, and foreign wholesale price inflation. This set of cost influences drives each of the industry-specific producer price indexes, in combination with a demand pressure indicator and appropriately weighted composites of the other producer price indexes.
- (7) **Supply.** In this model, aggregate supply (or potential GNP), is estimated by a Cobb-Douglas production function that combines factor input growth and improvements to

total factor productivity. Factor input equals a weighted average of labor, business fixed capital, and energy. Factor supplies are defined by estimates of the full employment labor force, the full employment capital stock net of pollution abatement equipment, the domestic production of petroleum and natural gas, and the stock of infrastructure. Total factor productivity depends upon the stock of research and development capital and trend technological change.

- (8) **Expectations.** Expectations impact several expenditure categories in the model, but the principal nuance relates to the entire spectrum of interest rates. Shifts in price expectations or the expected government capital needs influences are captured directly in this model through price expectations and budget deficit terms. The former impacts all interest rates and the latter impacts intermediate- and long-term rates. On the expenditure side, inflationary expectations impact consumption via consumer sentiment, while growth expectations affect business investment.

ii. Idaho Economic Model

The Idaho Economic Model (IEM) is an income and employment-based model of Idaho's economy. The Model consists of a simultaneous system of linear regression equations, which are estimated using quarterly data. The primary exogenous variables are obtained from the IHS Markit US Macroeconomic Model. Endogenous variables are forecast at the statewide level of aggregation.

The focal point of the IEM is Idaho personal income, which is given by the identity:

$$\text{personal income} = \text{wage and salary payments} + \text{other labor income} + \text{farm proprietors' income} + \text{nonfarm proprietors' income} + \text{property income} + \text{transfer payments} - \text{contributions for social insurance} + \text{residence adjustment}.$$

Except for farm proprietors' income and wage and salary payments, each of the components of personal income is estimated stochastically by a single equation. Farm proprietors' income and wage and salary payments each comprise sub-models containing a system of stochastic equations and identities.

The farm proprietor sector is estimated using a sub-model consisting of equations for crop marketing receipts, livestock marketing receipts, production expenses, inventory changes, imputed rent income, corporate farm income, and government payments to farmers. Farm proprietors' income includes inventory changes and imputed rent, but this component is netted out of the tax base.

At the heart of the IEM is the wage and salary sector, which includes stochastic employment equations for 23 North American Industry Classification System employment categories. Conceptually, the employment equations are divided into basic and domestic activities. The basic employment equations are specified primarily as functions of national demand and supply variables. Domestic employment equations are specified primarily as functions of state-specific demand variables. Average annual wages are estimated for several broad employment categories and are combined with employment to arrive at aggregate wage and salary payments.

The demographic component of the model is used to forecast components of population change and housing starts. Resident population, births, and deaths are modeled stochastically. Net migration is calculated residually from the estimates for those variables. Housing starts are divided into single and multiple units. Each equation is functionally related to economic and population variables.

The output of the IEM (i.e., the forecast values of the endogenous variables) is determined by the parameters of the equations and the values of exogenous variables over the forecast period. The values of equation parameters are determined by the historic values of both the exogenous and endogenous variables. IEM equation parameters are estimated using the technique of ordinary least squares. Model equations are occasionally re-specified in response to the dynamic nature of the Idaho and national economies. Parameter values for a particular equation (given the same specification) may change as a result of revisions in the historic data or a change in the

time interval of the estimation. In general, parameter values should remain relatively constant over time, with changes reflecting changing structural relationships.

While the equation parameters are determined by structural relationships and remain relatively fixed, the forecast period exogenous variable values are more volatile determinants of the forecast values of endogenous variables. They are more often subject to change as expectations regarding future economic behavior change, and they are more likely to give rise to debate over appropriate values. As mentioned above, the forecast period values of exogenous variables are primarily obtained from the IHS US macroeconomic model.

Since the output of the IEM depends in large part upon the output of the IHS model, an understanding of the IHS model, its input assumptions, and its output is useful in evaluating the results of the IEM's forecast. The assumptions and output of the IHS model are discussed in the National Forecast section.

iii. Exogenous And Endogenous Variables

Exogenous variables:

CPI	Consumer price index, all-urban, 1982 – 84 = 1.00
CRCATCVS	Cash receipts, US cattle and calves
CRCROP	Cash receipts, US crops
CRDAIRY	Cash receipts, US dairy
CSVOR	Real Consumer Spending – Other services, billion 2012 dollars
CENSUS	Value 1 when Census operations are in place, 0 otherwise.
ECON	Employment in construction
EDRIPS	Economic depreciation rate software
EEA	National Nonfarm Payrolls
ELHS	Employment in leisure and hospitality
EMD321	Employment in wood products
EMN311	Employment in food manufacturing
EMN323	Employment in printing and related support activities
ENRM21	Employment in mining
EPBS56	Employment–Administrative, Support, Waste Management, Remediation, millions
EXPUS\$	Non-agricultural production expenses
GDPR	Real gross domestic product, billions of chained 2012 dollars, annual rate
GF	Federal purchases of goods and services
GFGIIPRDR	Real federal investment in research and development, billions of chained 2012 dollars, annual rate
GFML	Federal defense purchases of goods and services
GFMLCWSS	Federal government defense personnel outlays
GFOCWSS	Federal government nondefense personnel outlays
HHAF	Household financial assets
HHAO	Household holdings of real estate and other nonfinancial assets
ID0IP2122_2123	Industrial production index, metal& nonmetal ore mining, 2017 = 100
IPSG311	Industrial production index, food, 2017 = 100
IPSG321	Industrial production index, wood products, 2017 = 100
IPSG322	Industrial production index, paper, 2017 = 100
IPSG323	Industrial production index, printing, 2017 = 100
IPSG3253	Industrial production index, agricultural chemicals, 2017 = 100
IPSG332	Industrial production index, fabricated metal products, 2017 = 100

IPSG3332	Industrial production index, industrial machinery, 2017 = 100
IPSG334	Industrial production index, computer & electronic products, 2017 = 100
IPSG3342	Industrial production communications equipment, 2017 = 100
IPSG335	Industrial production index, electrical equipment, appliances, and components, 2017 = 100
IPSG339	Industrial production index, miscellaneous manufacturers, 2017 = 100
IPSG51111	Industrial production index, newspaper publishing, 2017 = 100
IPSN32732T9	Industrial production index, concrete and cement products, 2017 = 100
JECIWSP	Employment cost index—private sector wages and salaries, December 2017 = 100
JEXCHBROAD	Broad U.S. trade-wtd. value of the dollar, index, 2017 = 100
JEXCHMTPREAL	Real US trade-weighted exchange rate with major currency trading partners, 2017 = 100
JEXCHOITPREAL	Real US trade-weighted exchange rate with other important trading partners, 2017 = 100
JPC	Implicit price deflator, personal consumption, 2017 = 100, chain weighted
N	Population, US
N16A	Population, US, aged 16 and older
RMFF	Effective rate on federal funds
RMMTG30CON	Commitment rate on conventional 30-year mortgage
RUC	Civilian unemployment rate, percent
TRF\$US	Government payments to US farms
TXSIDOM	Domestic social security tax receipts
WPI01	Producer price index, farm products, 1982 = 1.0
WPI02	Producer price index, processed foods and feeds, 1982 = 1.0
WPI08	Producer price index, lumber and wood products, 1982 = 1.0
WPI10	Producer price index, metals and metal products, 1982 = 1.0
YP	Personal income
YPAINT	Personal interest income
YPCOMPSUPPAI	Other labor income, US
YPCOMPWSD	Wage and salary disbursements

YPPROPADJF	Farm proprietors' income (with inventory valuation and capital consumption adjustments)
YPPROPADJNF	Nonfarm proprietors' income (with inventory valuation and capital consumption adjustments)
YPRENTADJ	Rental income of persons with capital consumption adjustment
YPTRFGF	Federal transfer payments to individuals
YPTRFGFSIHI	Federal medicare payments on behalf of individuals
YPTRFGSL	State and local transfer payments to individuals
YPTRFGSLPAM	State and local medical payments on behalf of individuals
ZADIV	Dividend payments, billions of dollars, annual rate

Endogenous Variables:

EEA_ID	Employment on nonagricultural payrolls, total
EEA_ID_2100	Employment in mining
EEA_ID_2300	Employment in construction
EEA_ID_3110	Employment in food processing
EEA_ID_3230	Employment in printing
EEA_ID_3250	Employment in chemicals
EEA_ID_3320	Employment in fabricated metal products
EEA_ID_3330	Employment in machinery
EEA_ID_3340	Employment in computers and electronic products
EEA_ID_4200	Employment in wholesale trade
EEA_ID_44_45	Employment in retail trade
EEA_ID_48_49_22	Employment transportation, warehousing, and utilities
EEA_ID_5100	Employment in information
EEA_ID_52	Employment in finance and insurance
EEA_ID_53	Employment in real estate and leasing
EEA_ID_54_55	Employment in professional, scientific, technical, and management
EEA_ID_56	Employment in Administrative and Support and Waste Management
EEA_ID_61	Employment in private education
EEA_ID_61	Employment in health care and social assistance
EEA_ID_71_72	Employment in leisure and hospitality
EEA_ID_DMANU	Employment in durable goods manufacturing
EEA_ID_GOODS	Employment in goods producing
EEA_ID_GV	Employment in government
EEA_ID_GVF	Employment in federal government
EEA_ID_GVSL	Employment in state and local government
EEA_ID_GVSLAD	Employment in state and local government, administration
EEA_ID_GVSLED	Employment in state and local government, education
EEA_ID_MANU	Employment in manufacturing
EEA_ID_MFDNEC	Employment in other durable manufacturing
EEA_ID_MFNNEC	Employment in other nondurable manufacturing
EEA_ID_NMANU	Employment in nondurable manufacturing
EEA_ID_NONGOODS	Employment in nongoods producing
EEA_ID_SV	Employment in services
EEA_ID_WOOD	Employment in wood products and logging
ID0CRCROP	Cash receipts, crops
ID0CRLVSTK	Cash receipts, livestock
ID0EXFP	Farm production expenses

ID0HSPR	Housing starts, total
ID0HSPRS1_A	Housing starts, single units
ID0HSPRS2A_A	Housing starts, multiple units
ID_HOUSE_SF	Idaho housing stock
ID0NB	Number of births
ID0ND	Number of deaths
ID0NMG	Net in-migration of persons
ID0NPT	Resident population
ID0WBB\$	Wage and salary disbursements
ID0WBBCC\$	Wage and salary disbursements, construction
ID0WBBF\$	Wage and salary disbursements, farm
ID0WBBMF\$	Wage and salary disbursements, manufacturing
ID0WBBMIL\$	Wage and salary disbursements, military
ID0WBBOTH\$	Wage and salary disbursements, except farm, manufacturing, military, and construction
ID0WRWCC\$	Average annual wage, construction
ID0WRWMF\$	Average annual wage, manufacturing
ID0WRWOTH\$	Average annual wage, except farm, manufacturing, military, and construction
ID0YDIR\$	Dividend, interest, and rent income
ID0YFC\$	Corporate farm income
ID0YINV_R\$	Farm inventory value changes, imputed rent, and income
ID0YP	Total real personal income, 2005 dollars
ID0YP\$	Total personal income
ID0YP\$PC	Per capita personal income
ID0YPNF	Nonfarm personal income, 2005 dollars
ID0YPNF\$	Nonfarm personal income
ID0YPNFPC	Per capita nonfarm income, 2005 dollars
ID0YPPC	Real per capita personal income, 2005 dollars
ID0YPRF\$	Net farm proprietors' income
ID0YPRNF\$	Nonfarm proprietors' income
ID0YPTXB	Tax base, 2005 dollars
ID0YRA\$	Residence adjustment, personal income
ID0YSI\$	Contributions for social insurance
ID0YSUP\$	Other labor income
ID0YTR\$	Transfer payments to individuals
ID0YTRF\$	Government payments to Idaho farmers
IDWAGE	Idaho average annual wage
YPADJ_ID	Adjusted total personal income