Idaho Economic Forecast

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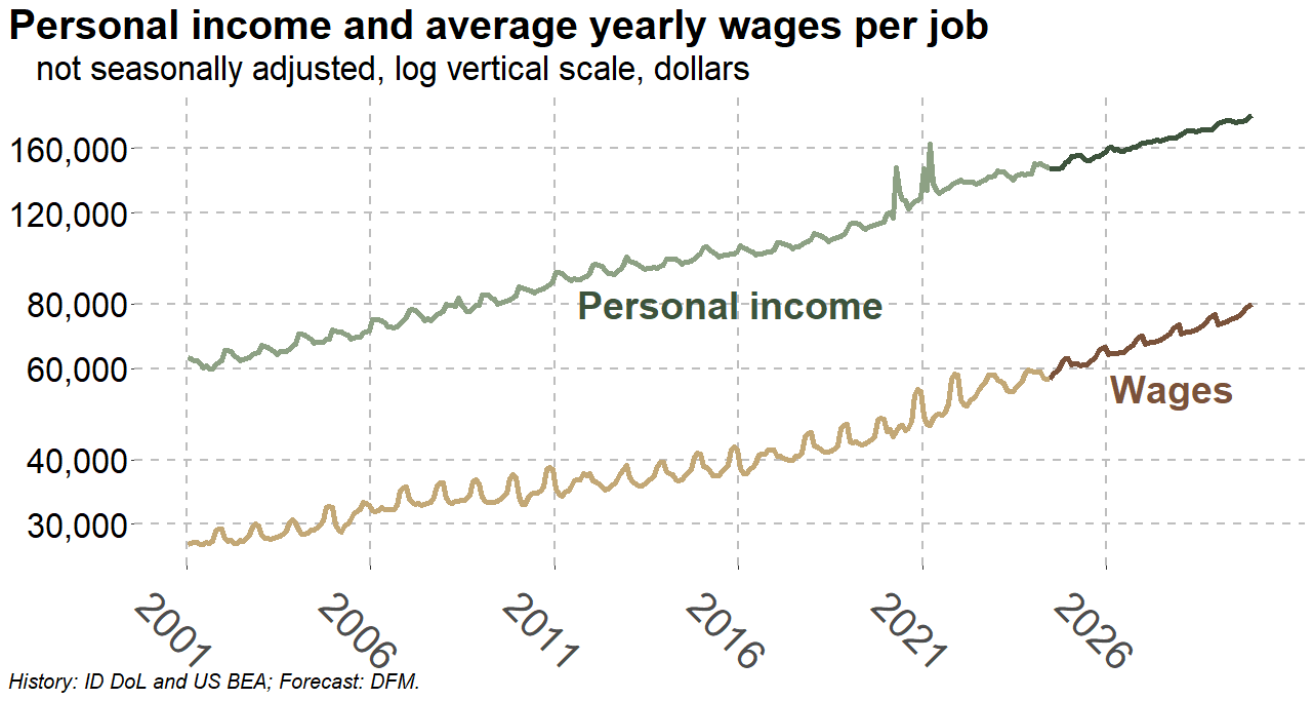
Division of Financial Management
Executive Office of the Governor

January 2025 January 6, 2025

ISSN 8756-1840

- **Forecast begins the third quarter of 2024**
- **Baseline outlook**
- **Alternative forecasts**
- **Analysis**



Idaho Economic Forecast 2024–2029

State of Idaho
BRAD LITTLE
Governor

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01-2025/010200-180-4001

Introduction

This document summarizes Idaho's economic forecast for 2024 through 2029. The primary national forecast in this report is the December baseline forecast for the US economy by Moody's Analytics. The Idaho economic model takes the national forecast as an input.

Idaho's Department of Labor provides monthly historical employment data. Employment data is now used at the monthly frequency, and seasonal adjustment is not performed perfunctorily. Data is complete through 2024m6. Wage data is also supplied by the Idaho Department of Labor. This data is only collected at the quarterly frequency. This is adjusted by DFM to monthly data consistent at the quarterly level.

Historical and forecast data for Idaho are available. These are now provided via this link. The linked xlsx file includes data for broad sectors of the Idaho economy at the monthly frequency, and data for narrower sectors of the Idaho economy at the half-year frequency.

Cover. Traditionally the cover of the January edition of the Idaho Economic Forecast shows some aspect of personal income in the state. This time we have chosen to illustrate this on a "per job" basis, even though personal income is a much broader concept than earnings from work. The graph illustrates this by accompanying the personal income per job figure with the average yearly wage per nonfarm job.

Both are graphed at the monthly frequency. Much of the turbulence in each sequence is due to the monthly fluctuations in employment counts in Idaho. Many of our industries have high degrees of seasonality in employment. Some of this comes from working outdoors. Some of it is present due to desk-jobs as well. Accountants and workers at schools certainly have on- and off-seasons.

The graphs are produced using a log vertical scale. If we focus on the average wages in 2016, we see that the level was very close to $40,000 per job. The forecast shows those growing to $80,000 per job at the end of the forecast horizon, i.e., doubling in nominal terms. If we consider the vertical markers on the left axis in light of that $40,000 figure, we see that, going up from there, the markers are set at 1.5×, 2×, 3×, and 4×.

Figures, such as wages and personal income, which grow exponentially, follow straight lines when graphed on log vertical scales. Exponential growth is occurring when a figure regularly doubles, or when it regularly grows by 3% per year. They may be different rates of exponential growth, but both are exponential. Typically we think of exponential growth as "fast" growth, but in reality, the concept of exponential growth is pervasive in the economy.

Personal income is expected to have roughly doubled from mid-2008 to 2026. Those twenty-two years would be slightly longer than the expansion which doubled it from near the $60,000 level per job at the turn of the millennium to crossing above $120,000 per job just as the covid recession was beginning (twenty years for that doubling).

The Federal Reserve Bank of San Francisco, the regional federal reserve bank covering Idaho, has three recent articles, one on water resources, another on productivity since the pandemic, and one on the interaction between heat in the economy and inflation. Water resources and the future economic health of Idaho have been major focuses of the Idaho legislature, businesses,

and Idaho's agricultural industry; the article gives a geographic and distributional summary of water resources and uses in the US. Productivity gains have proven to be a main explanation of the continuing out-performance of the US economy versus other world economies since the pandemic. Also contributing to the strong US economy has been the steadying of the inflationary pressures while still maintaining an expanding jobs market. These three publications provide current discussion and analysis of these topic pertinent to Idaho. The article on productivity is an easier read, perhaps written so as to exemplify for the worker who is digesting it the topic it is discussing.

The FRBSF provides many publications, and other research letters can be found at their website. Overall views of the economy are also published by the FRBSF. Those are published in their fed views series.

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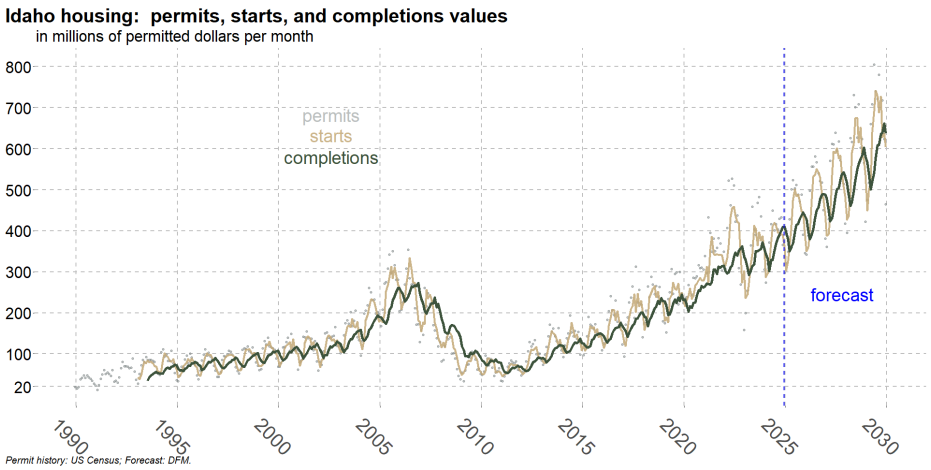
Overview

Modeling. In recent prior editions, we have mentioned that the economic forecast produced by DFM primarily relied upon housing permits measured in units (counts of residences for single households), though we became aware that there was data on housing permit values. The translation from permits to starts to completed units is mathematically computed in the economic model using lags of each earlier stage to predict each later stage. Applying the translation logic to the permit values provides an indication of the importance of the housing sector within the Idaho economy.



In several ways, that indication understates the importance of housing within the Idaho economy. First, this relies upon the value of the permits. In housing markets like Idaho has recently experienced, the value of the permit may be less than the value of the work and the materials that the permit represents; buyers of houses have bid up housing values. Second, housing allows many other economic activities, including holding jobs within the state and fostering consumer purchases. Third, permits from years past for housing units may, across time, result in permits for additions or remodels. Those additional permit values are not included in the measures here. Only new housing units are included, not newly refurbished, but of course, maintaining, refurbishing, and augmenting houses is a major business.

US Summary. We find that the following data tables quickly describe a lot about the national and state economies.

The first table records variables key to the national economy. All of the forecast data in the national table is due to Moody's; historical data in the table is that reported by US statistical agencies such as the US Census Bureau, Bureau of Labor Statistics, or Bureau of Economic Analysis.

US	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
inflation, CPI measure	1.3	4.7	8.0	4.1	2.9	2.3	2.8	2.5	2.3	2.1
real GDP growth	-2.2	6.0	2.5	2.9	2.8	2.2	1.6	1.8	2.1	2.3
Federal Funds rate	2.2	0.4	0.1	1.7	5.0	5.1	4.1	3.4	3.0	3.0
mortgage rates	3.9	3.1	3.0	5.3	6.8	6.7	6.2	6.0	6.0	6.0
employment growth	-5.8	2.9	4.3	2.3	1.6	0.9	0.4	0.3	0.3	0.4

Inflation. Inflation is expected to be lower in 2025, with an uptick in 2026 to 2.8% and then steadily return to the target rate over the next few years. The uptick in 2026 is likely due to uncertainty around the fiscal policy changes that could occur with the upcoming administration change in January. Moody's lists tariffs as a key risk in getting inflation to the target level. The target level is 2% inflation as measured by core personal consumption expenditures.

Real GDP. Real GDP is expected to be lower than recent years in the forecast years of 2025 to 2027. Starting in 2028, growth is seen to return to a natural state of about 2%. This is after relatively high growth from 2021 to 2024. There is currently uncertainty around monetary and fiscal policy, and there are expected immigration changes; likely changes in these policies could tamper growth in the coming years.

Federal Funds Rate. Moody's expects two rate cuts in 2025, in March and September. The US Federal Reserve's Federal Open Market Committee expressed no definite plans for rate cuts in 2025 and stated that they were going to observe the policy changes before deciding on when the next rate change would occur. Due to expected changes in fiscal, tariff, and immigration policies, the current expectation for inflation to return to the target rate is slower than previously anticipated.

Mortgage Rates. The October Idaho Economic Forecast (IEF) saw mortgage rates coming just below 6% by 2026. With the December revision of the forecast published by Moody's, markets are expected to keep mortgage rates at or above 6% for the remainder of the outlook. 2026 is expected to have a 6.2% rate, with the rest of the out-years steady at 6%.

Employment Growth. The labor growth forecast was revised down from the October forecast Moody's released. Moody's lists the expected reduction in international migration as a major factor in the reduction in employment growth. They also expect a reduction in immigration to decrease the pace of new job growth in the coming years. Moody's expects unemployment to stay around 4% in the next few years.

Idaho Housing. Housing output for Idaho is summarized in our next table. The data is recording "thousands of units" per year, and the measure record activity from July of the prior year until July of the named year; that is the way the US Census Bureau studies housing.

The Idaho Economic Forecast projects multiple measures regarding housing stock. The first indicator for a new house in Idaho is building permits for residential housing. There are two types of residential housing structures: multi-family homes and single-family homes. Multi-family homes include buildings like apartment complexes. Each unit is permitted, so each building permit can be seen as one potential unit for residential dwelling.

Most permits, but not all, become housing starts. There is a lag between a permit and a start. Similarly, not all starts become complete housing units. Again, there is a lag between when a house is started and when it is completed. For single family homes, our modeling shows that

the lag can take up to one year for permit to start and up to (about) two years from start to completion.[1] For multi-family homes the lags may be up to about three years for each stage.[2]

The three housing stock measures are expected to increase in the forecast. Focusing on completions, there are expected to be 18,900 new housing units completed in 2025 with increases in each following year through 2029. It is notable that Idaho is weathering the higher mortgage rates, which usually deters home purchases. This is due to sustained high demand for housing units in Idaho.

ID housing units	2003	2004	2005	2006	2007	2008	2009	2010	2011
permits	13.9	15.8	19.2	20.6	14.8	9.8	5.2	5.6	3.7
starts	12.6	14.5	17.8	20.3	15.9	10.8	6.3	5.5	4.1
completions	11.6	14.2	16.6	19.9	17.0	13.1	8.5	6.4	4.6
Census: stock change	14.3	16.0	18.9	21.9	17.2	12.4	6.8	5.1	4.1
IEM: stock change	13.0	14.6	16.4	20.0	20.9	16.4	11.1	6.6	4.8

ID housing units	2012	2013	2014	2015	2016	2017	2018	2019	2020
permits	5.5	7.5	9.1	9.2	10.5	11.8	14.6	14.5	16.7
starts	4.8	6.8	8.4	8.6	9.6	10.9	13.5	14.0	15.5
completions	4.5	6.0	7.5	8.2	9.6	10.7	12.4	14.1	14.3
Census: stock change	3.9	6.2	8.5	8.5	9.7	11.8	13.9	15.6	5.1
IEM: stock change	4.0	4.3	6.7	8.4	8.7	10.1	12.2	14.5	12.8

ID housing units	2021	2022	2023	2024	2025	2026	2027	2028	2029
permits	19.0	21.2	15.3	18.6	20.5	23.0	24.5	25.9	27.0
starts	17.2	19.3	15.7	17.4	19.0	21.1	22.4	23.6	24.7
completions	17.4	17.6	17.2	17.5	18.9	19.2	20.5	21.6	22.7
Census: stock change	18.8	21.6	18.6						
IEM: stock change	8.8	19.3	20.8	18.4	17.2	19.6	20.8	22.0	23.1

[1] 70% of permits turn into starts within two months, though, and more than 75% of starts are completed within eight months of starting.

[2] The slowest 10% of transitions from permit to start can take 2–3 years for multi-family structures, and more than 20% of starts take at least 1.5 years to be completed, with completion times ranging up to about 40 months.

Current economic conditions

Global conditions.

Overall. The Organization for Economic Co-operation and Development (OECD)[3] released their Economic Outlook publication in early December 2024. The OECD has called the global economy resilient. They listed lower inflation levels, employment growth, and an easing in restrictive monetary policy as major factors for the current global economic growth.

Moody's Analytics, which provides the Division of Financial Management with forecast data at the national and state level, shared the same overall sentiments that OECD did. They stated that the global economy fared better than expected during the monetary policies (used across the globe) to combat inflation in 2022 and 2023. They are indicating that a "soft landing" seems likely, meaning that monetary policy was successfully used to combat inflation without pushing economies into recession.

When Moody's looks to the future, it expects slowing of global markets, while still expecting growth on average. Two factors that will impact many economies in the long term are a decline in the (typical) working age population (as workers age out of their prime working years), and personal and national debt levels rising.

The International Monetary Fund (IMF) also states that the global economy has proven resilient during the past four years. While the overall global picture appears healthy, there are regions which did not fare as well as others. The IMF also points out that there are many elections which occurred in 2024 all across the globe, and fiscal and monetary decisions from newly elected leaders will play a role in the economic direction of the next few years.

Monetary policy. OECD highlights the importance of the size and timing of rate reductions. They expect inflation to return to the target level by 2026 and state that interest rates should be back to the neutral rate at that time. IMF suggests that as inflation rates near their target levels, there will need to be a shift from monetary policy to fiscal tightening to ensure the efforts of rate changes remains successful.[4] Moody's now forecasts federal funds rate as stabilizing at 3.0 percent beginning in 2027. This is a bit higher than had been their terminal (steady–state) rate earlier in the year.

Labor. OECD described the current labor market conditions as less tight. Since 2020, there has been a higher than typical number of job vacancies per unemployed person. This has contributed to the increase in wages. As inflation cools, the labor market is returning to a more typical structure. Unemployment is coming back to a more baseline level as well, but the OECD points out that the unemployment rates are still low compared to historical standards. IMF expects wages to continue to moderate as the inflation rate tamps down. They also point out that, in the US, while

[3] The US is a member.

[4] Monetary policy was loosened in the wake of the onset of the pandemic to stimulate economies; once inflation far overshot acceptable levels, monetary policy tightened in a reversal. Now economists expect fiscal policy to tighten, relieving some of the pressure to maintain tight monetary policy as inflation gradually makes the last leg of its journey down toward the target rates (typically about 2% in advanced economies).

wages have grown, so has productivity. This has helped keep unit labor costs contained. Moody's expects the unemployment rate to normalize gradually and does not expect a large increase in layoffs. They do expect the projected moderate global growth conditions to ease the global labor market.

Unrest. There remain many conflict zones in the world. Sudan's civil war has displaced close to 10 million of its residents. Many have reached Chad or South Sudan. Syria's recent regime change remains in flux. The Israeli–Hezbollah war has reached a cease-fire, but the Israeli–Hamas war has not. Myannmar's ruling government does not have control of much of that country's boarders; rebelling groups control most of that territory. The Rohingya refugees in Bangladesh are a consequence of that conflict. Bangladesh saw its prime minister flee; a care-taker prime-minister has been appointed, but elections seem to still be a ways off. South Korea has impeached its elected president, and then the appointed successor to that post as well. Finally, the Russia-Ukraine war is ongoing. Each of these conflicts presents the possibility of unstable migration patterns.

US.

GDP outlook. The OECD projects consistent growth for the US, coming in at 2.8% for 2024, 2.4% for 2025, and 2.1% in 2026. Housing investment has remained subdued because of higher interest rates used to combat inflation. A risk the OECD is paying attention to is the possibility that private consumption growth decreases in the coming years. The savings consumers accumulated during the pandemic years have been fully expended.

Moody's recognized the importance of consumer spending when looking at the Q3 GDP growth for the US. GDP growth was marked at 2.8%[5].

> Consumer spending remained an important source of growth, adding 2.4 percentage points to growth, compared with 1.9 percentage points in the prior quarter. ... The outlook for 2025 real GDP growth on an annual average basis was nearly unchanged from last month. Real GDP is still projected to rise 2.2% on an annual average basis. More significant changes occur in subsequent years as the impacts of fiscal and monetary policy changes and reduced immigration take their toll. Growth will be 1.6% in 2026 and 1.8% in 2027, before returning to trend in 2028. The prior forecast had growth of 2% in 2026 and 2.2% in 2027. The slower growth is broad-based across GDP components.

Labor. The OECD has seen a rebound in labor productivity growth, with the current growth rates coming in higher that the pre-pandemic average.

After a lower than anticipated October jobs report, the November jobs report came in strong at 227,000 new jobs added.[6] There were also upward revisions to the September and October reports. Moody's notes that the unemployment rate did increase from 4.1% to 4.2%. Due to the

[5] That second measure of GDP was revised up to 3.1% in the third reading of Q3 GDP; see https://www.bea.gov/sites/default/files/2024-12/gdp3q24-3rd.pdf

[6] The links can be found on the webpage https://www.bls.gov/bls/news-release/empsit.htm#2024.

upcoming change with President Trump's re-election, Moody's expects a lower labor supply due to changes in immigration policies.

Monetary policy. Moody's expects a pause in the cuts to the federal funds rate in early 2025, concurrent with the newly elected administration's transition. This will give time for the Federal Reserve Bank to assess short term effects of policy changes that could go into effect beginning as early as January 2025. Moody's expects rate cuts to resume at some point in 2025. The goal with rate cuts is to bring the federal funds rate back to an equilibrium rate, with the goal being about 3%.[7] The rate was near 4.6% prior to the December 18 cut implemented by the Federal Reserve, lowering short term rates by another 0.25 percentage points.

The Federal Open Market Committee (FOMC), as defined on their website "consists of twelve members — the seven members of the Board of Governors of the Federal Reserve System; the president of the Federal Reserve Bank of New York; and four of the remaining eleven Reserve Bank presidents, who serve one-year terms on a rotating basis". The FMOC meets eight times per year. Part of their charge is to make projections for major economic indicators including: Real GDP, unemployment rate, Core Personal Consumption Expenditures (core CPE), and the Federal Funds rate. The following is a summary of their projections:

- The Real GDP projection for 2024 reached consensus around 2.4% to 2.5% for 2024, a shift up from the previous meeting. The remaining out years were effectively unchanged.
- The unemployment rate also reached a unanimous consensus at 4.2% to 4.3% for 2024. For the 2025 projection, it decreased slightly with most projections at 4.2% to 4.3%.
- The Core Personal Consumption Expenditure (PCE) projection for 2024 shifted up in the December meeting. All projections are between 2.7% and 3.0%. The distribution in December looks similar to the June meeting. They also expect core PCE to by higher in 2025 than they expected during the September meeting.
- The Federal Funds projected rate also shifted up in 2025, likely due to the projection of a higher core PCE in 2025. The 2024 rate reached consensus at 4.38% to 4.62%.

Fiscal policy. With President Trump's re-election and a Republican controlled Congress, Moody's expects that economic and fiscal policy is likely to experience substantial changes. Some of the tax policies that were enacted during Trump's first term in office, through the 2017 federal legislation called the Tax Cuts and Jobs Act, are likely to be extended. Under current law the individual income tax provisions are due to sunset at the end of 2025. Moody's expects the tax policy renewal to be taken up over this upcoming summer. Moody's also expects some legislation that would constrict government spending late in 2025.

Housing. Overall, investment growth in the US has been strong according to the OECD, but housing investment, which is particularly affected by the higher interest rates, remains lower than other industries.

[7] That goal is the one communicated by the FOMC in their "dot-plot" summary of economic projections. It is also one which the economist at Moody's see as reasonable.

Moody's revised downwards both their projection for existing home sales and their new home construction outlook from the November forecast. This is due to the projection that rate cuts will be paused as the new administration comes into office. Moody's does point out that demand for housing is expected to remain strong due to a nationwide low supply of housing available for purchase. With interest rate changes not expected in the early months of 2025, that in effect lowers the expected incentive for new housing construction.

Idaho. Much, though certainly not all, of Idaho's recent economic growth comes from demographic changes.

Population.

- New U.S. Census Bureau estimates put Idaho population above 2 million for July 2024. This occurred a few months earleir than the DFM estimate for crossing that threshhold.
- The Census Bureau recorded about 16,700 new residents of Idaho in 2023, after accounting for the residents that left the state. Most of the people moving to Idaho are from California, Washington, Oregon, Utah, Texas, and Arizona.
- The Idaho Department of Education served 920,000 meals in 2024 through their Summer Food Service Program. The program offers free meals to children in low-income areas.
- Declining kindergartener enrollment has led to positions being cut in the Twin Falls and Blaine County school districts. The superintendents cite declining birth rates and changing local demographics as the cause for the drop in enrollment.

Federal money is an important contributor to the Idaho economy. State monies are also put to important projects across the state.

Grants.

- The Idaho Falls Regional Airport was awarded $2.5 m from the Federal Aviation Administration for terminal expansion.
- University of Idaho, aided by an $800 k grant from the U.S. Department of Agriculture, is studying the effects on air quality of farming practices primarily aimed at conserving water, reducing erosion, and improving sustainability.
- Boise's Our Path Home and the Idaho Housing and Finance Association together received $7 m in federal grants from the U.S. Department of Housing and Urban Development to address youth homelessness.
- A $10 m state grant will widen Ustick Road, a major 37-mile road running through Boise, Meridian, Nampa, and Caldwell, to four lanes.
- The Weiser River Soil Conservation District completed the Galloway Diversion Dam Restoration project, using $383 k of state and local funding.

Businesses continue to expand and change within the state.

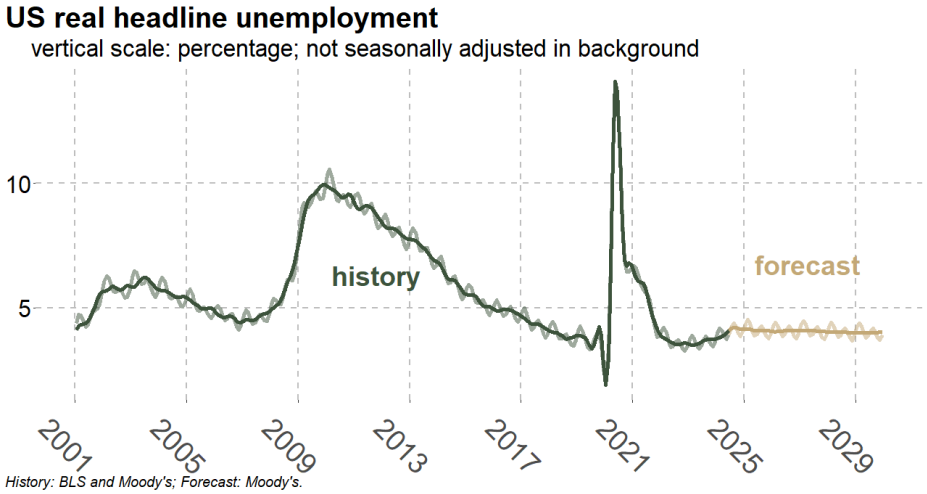
Commerce.

- St. Alphonsus–Nampa is bringing new NICU[8] beds and additional cardiology space through a hospital expansion set to begin in late 2025.
- Clearwater Paper, in Lewiston, Idaho, sold its tissue business to Sofidel America Corp., an Italian company. The sale totaled $1.06 b. The tissue business is only part of Clearwater Paper's total operations. Clearwater Paper employs about 1,300 people in Lewiston, with about 500 employed in the tissue operation.
- Pleasant Valley Solar, in partnership with Meta, is set to start phase two of construction for a solar plant that will help power Meta's data center in Kuna.

Hospitality and leisure is a large sector in the Idaho economy. Recreational opportunity is one driver of that industry in the state.

Stewardship.

- Boise National Forest, with approval from the Idaho Department of Environmental Quality, is planning controlled debris burns to reduce the amount of available bio-matter fuel for wildfires.
- In 2024, Idaho Fish and Game has recorded the highest number of returning steel-head trout since 2015.



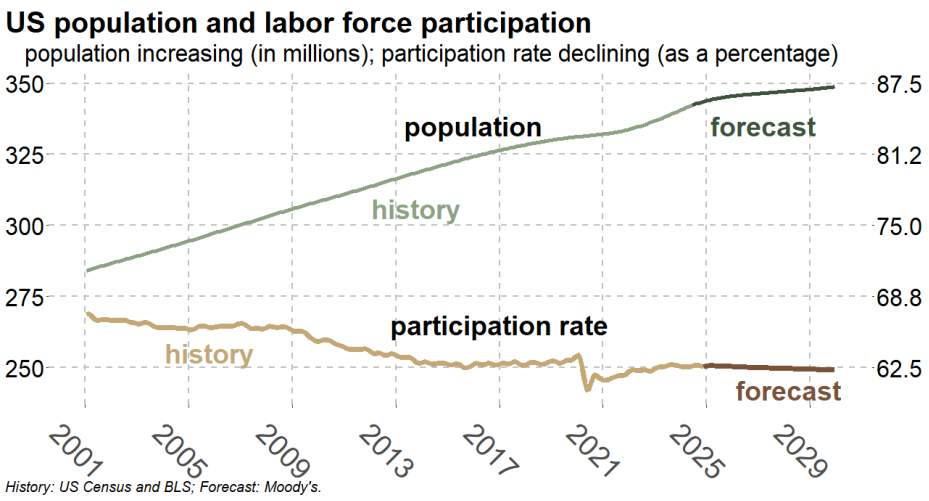
Idaho and the US.

Unemployment. The US unemployment rate is expected to hover around 4% for the forecast period. The unemployment rate used is referred to as the U-3 rate which is the percentage of adults who are unemployed, have actively sought work in the last four weeks, and are currently able to work. Commonly, full employment is generally accepted to have an unemployment rate between 4% and 5%. This means that the forecaste years sees Idaho having full employment.

The top line shows the historical and forecast US population according to Moody's December outlook. The bottom line shows the historical and forecast labor force participation rate. The forecast does not see an increase in the labor force participation rate, with a very gradual decline between 2025 and the end of the forecast period.

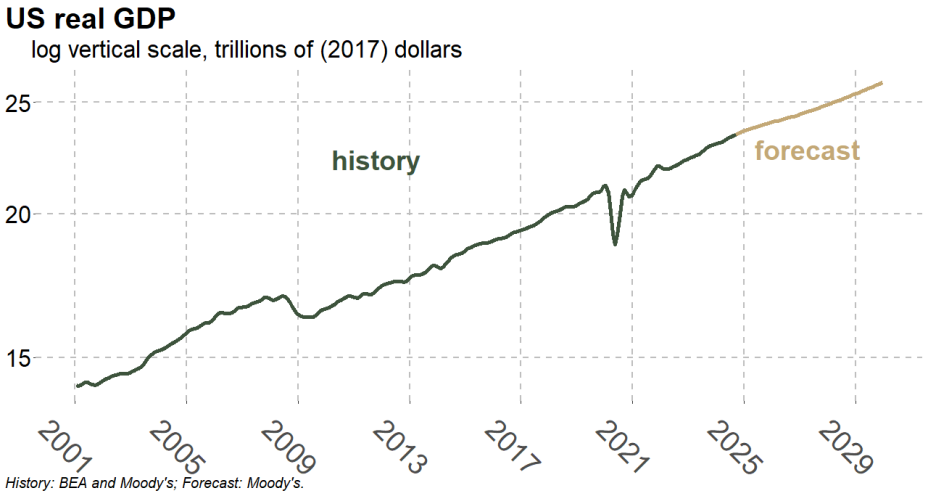
[8] neo-natal intensive care unit

In contrast, the state remains a destination for migrants from other US states, as we have noted, primarily Washington, Oregon, and California. Population gains expected across the forecast could see the state crest above 2.1 m relatively soon, certainly before the five-year forecast horizon is complete (barring a major recession). The state just crossed above 2 m residents according to the December release of population estimates by the US Census Bureau.



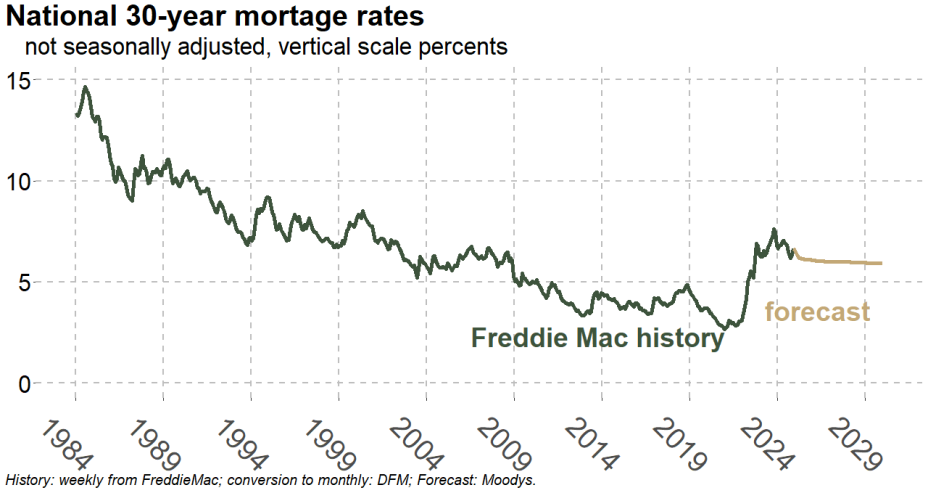
Economic outlook

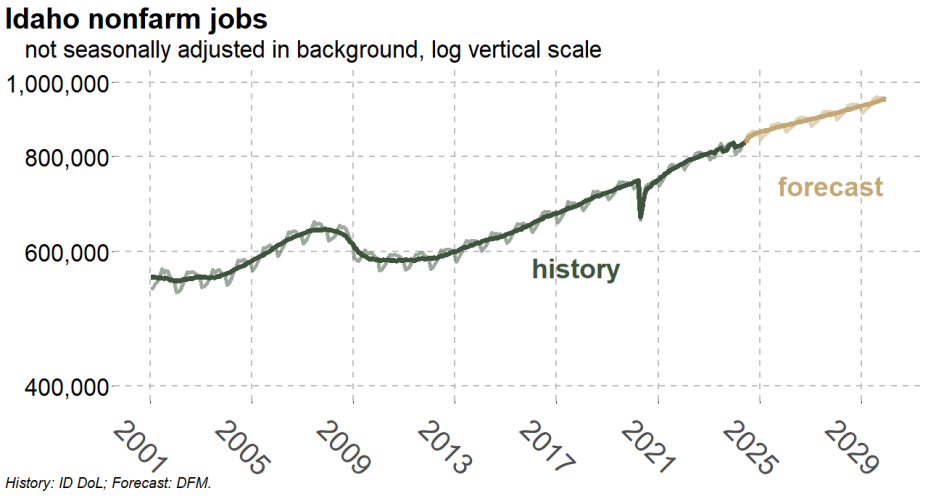
Moody's very short-term projection of real GDP, which is Gross Domestic Product after adjusting for inflation, was essentially unchanged from the previous forecast. Consumer spending was listed as a strong factor for the 3% growth in the third quarter. Moody's expects lower, but still moderately positive, growth in 2025 at 2.2% for the year. Their medium-term forecast includes more uncertainty in 2026 and 2027, as expected policy changes take effect. As shown in the summary table on page 7, real GDP growth is projected to be under 2% in both 2026 and 2027.



US growth rates	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
US nonfarm jobs	-5.8	2.9	4.3	2.3	1.6	0.9	0.4	0.3	0.3	0.4
US population	0.3	0.4	0.7	1.0	1.1	0.7	0.4	0.2	0.2	0.2
Total personal income	6.8	9.2	3.1	5.9	5.5	4.4	4.5	4.2	4.0	4.4
... inflation adjusted ...	5.7	4.9	-3.3	2.1	2.9	2.1	1.9	1.8	1.8	2.3
Wage & salary payments	1.5	9.0	7.8	5.4	5.9	4.6	4.5	3.9	3.3	3.7
... average US wage ...	7.9	5.8	3.4	3.0	4.3	3.6	4.1	3.6	3.0	3.3

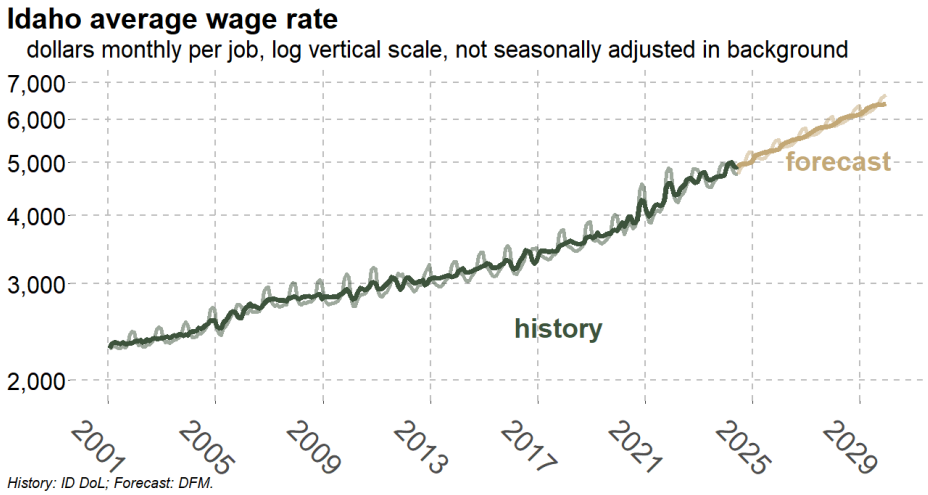
With inflation and the Federal Fund rate expected to come down to a steady state, 30-year mortgage interest rates are also expected to come down in 2025 and trend slightly down throughout the forecast period. The rate in 2029 is expected to be around 6%. The rates in the chart show historical data from Freddie Mac, the quasi-governmental housing agency; that is the mortgage rate data Moody's forecasts going forward.





Nonfarm jobs are expected to increase steadily during the forecast period. We use the opportunity this graph provides to describe the elements you can find in several of our graphs. Often both seasonally adjusted values as well as the raw, not seasonally adjusted values are plotted in the same figure. The smoother curves tend to be the seasaonally adjusted value; we graph these in more vibrant colors placed in the foreground of the chart. The sometimes erratic appearing curves placed in more muted colors and shown in the background of the chart are the non-seasonally adjusted values. Providing these gives an indication of the typical monthly changes within the labor market.

For total nonfarm jobs within the state, we expect continued expansion. Generally this has been about 3% annual growth recently. As compounding 3% growth is a classic exhibit of exponential growth, our history is (roughly, through the seasonally adjusted data) an exponential curve, and so our forecast ought to be similar. By graphing on a logarithmic vertical scale, that exponential growth path is depicted by a straight line: logarithms turn constant ratios (such as 1.03) into constant increments. That is why slide rules were used in classrooms prior to electronic calculators, since our process for addition is easier for hand computation than our process for multiplication.

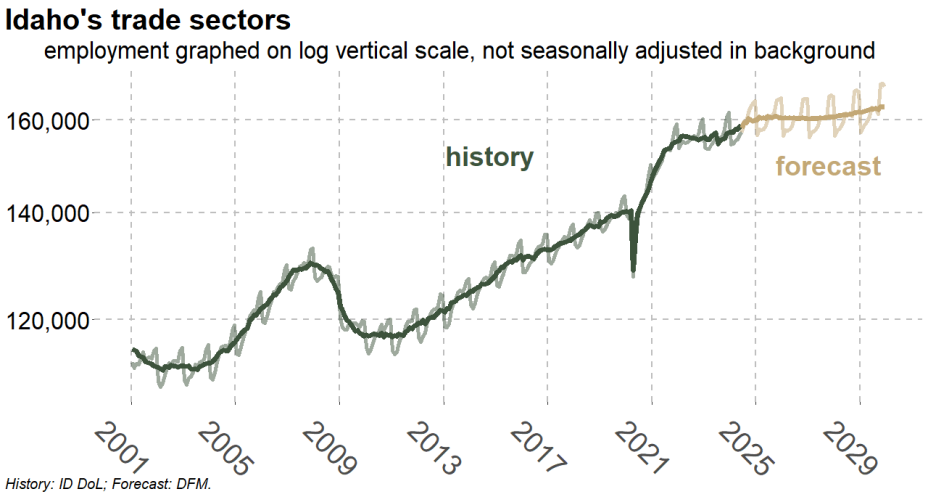


Wages often grow exponentially as well. For example, a 5% annual raise is exponential growth. Wages in Idaho have even beat exponential growth a bit, as seen in the history portion of the average wage rate graph: a curve upwards on a logarithmic vertical scale graph indicates growth a bit faster than exponential.

The average wage rate reflects the average amount each job in Idaho is paid out in wages. Similarly to the October publication, Idaho wage growth continues to have a robust forecast. Wages are closely tied to population growth which has been strong for many years. As people continue to move to Idaho for jobs, the wage forecast reflects this and shows robust growth in the forecasted years.

ID growth rates	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
ID nonfarm jobs	-0.6	5.8	4.0	2.6	2.9	3.4	2.0	1.9	2.0	2.2
ID population	3.4	3.0	2.1	1.4	1.5	1.6	1.5	1.5	1.5	1.5
Total personal income	10.6	15.2	4.9	5.3	6.8	7.7	5.9	5.7	6.4	6.7
... inflation adjusted ...	9.4	10.6	-1.6	1.5	4.2	5.3	3.3	3.3	4.1	4.5
Wage & salary payments	7.2	12.6	11.1	6.4	8.2	8.7	7.3	7.0	6.9	7.0
... average ID wage ...	7.7	6.4	6.9	3.8	5.2	5.2	5.2	5.0	4.7	4.7

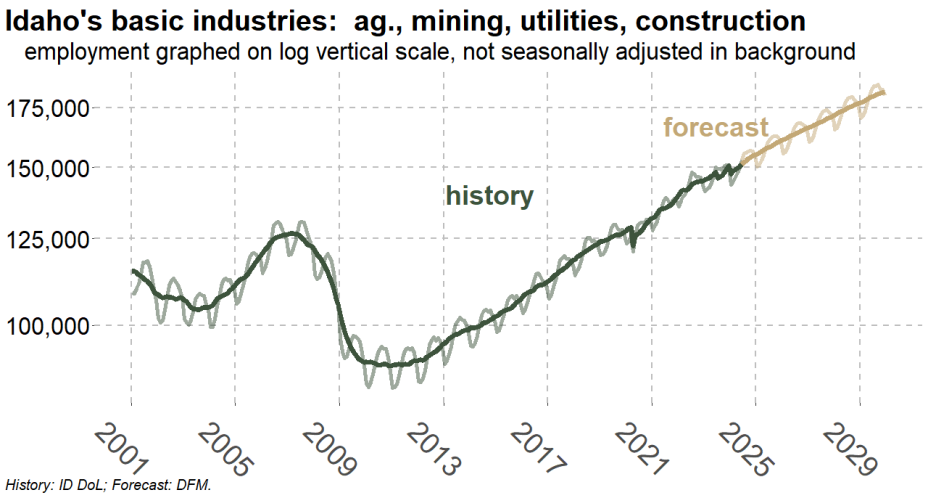
Labor market data.



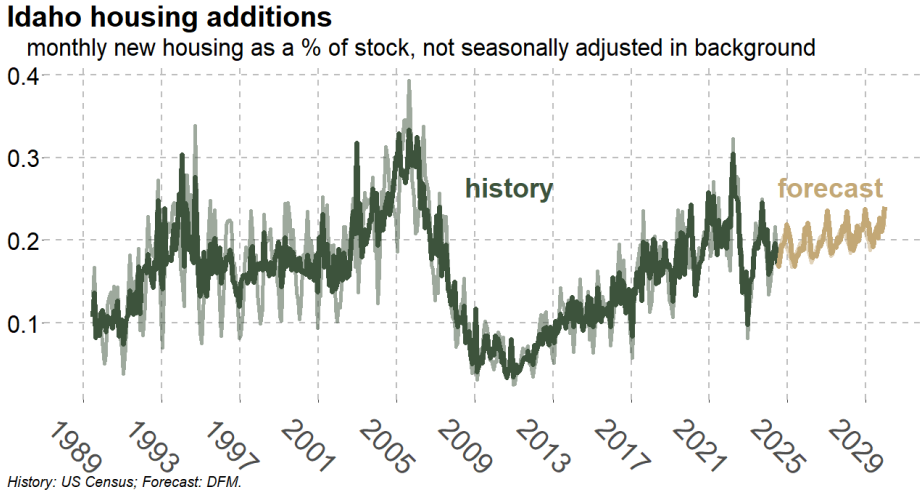
Trade. The trade sectors include retail trade, wholesale trade, and transportation. Compared to the October forecast for employment in the trade sector, this quarter's baseline forecast sees improved growth in the long term. While expected growth is not overwhelmingly positive, compared to the decline in growth seen in October, there is expected to be little change from year to year in the forecast. The seasonality in the forecast period for the sectors are also tighter and looks more similar to what history dictates is typical for the industry.

Basic industries. Employment in the construction industry, encompassed in the "basic industries" category that also includes agriculture, mining, and utilities, is set to see growth in the coming years. The construction industry is greatly affected by seasonality. Seasonality is also present in the other sectors included in basic industries; for mining, the easiest place to understand this is in the gravel quarry subsector, which is tied to construction.

The graph shows the seasonally adjusted values[9] in the bold line, while the seasonal data can be found in the transparent line. After the pandemic, the seasonal nature of the industry was slightly disrupted; seasonal adjustment appears more jagged than in the years prior to 2020. The forecast shows a return to a smoother seasonal, and seasonally adjusted, trend.



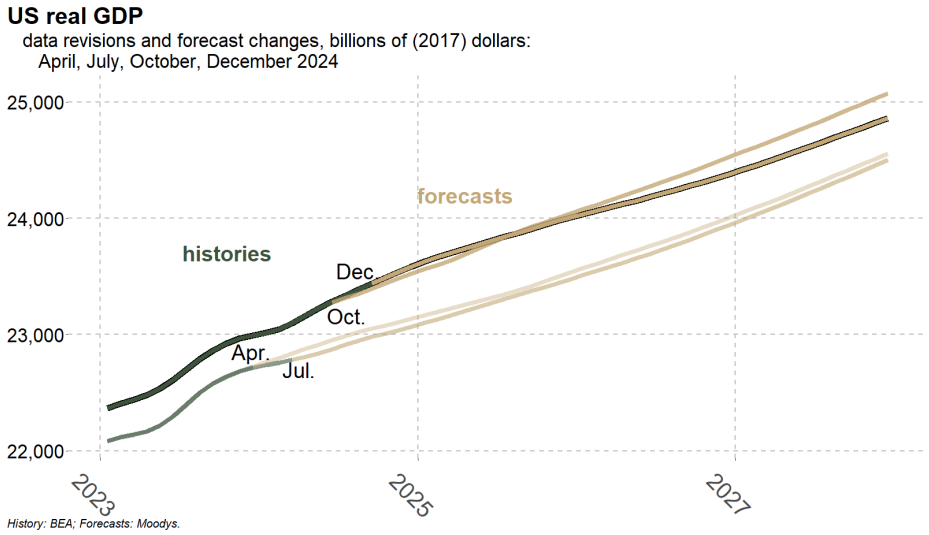
Housing and Construction. The Idaho housing stock includes all housing units available in Idaho. In the last five years, total housing stock has increased by nearly 95,000 homes. Just in 2024, there was an estimated 13,000 houses added to the housing stock.



The chart shows the percent of new house additions out of the total housing stock. What is quite remarkable, is that the percentage is relatively stable and growing since 2011. This is remarkable because as new homes are completed, they get counted in the total housing stock. This means that the new housing additions coming on the market must be increasing at a greater rate than the existing housing stock to show a positive trend. The forecast for this percentage shows growth, although moderate. Housing permits eventually usually become starts which eventually usually become completed housing units. The expected trajectory is for continued expansion of the housing stock at a near-record clip (in terms of counts, though not in terms of percentages).

[9] also called seasonally *smoothed* values

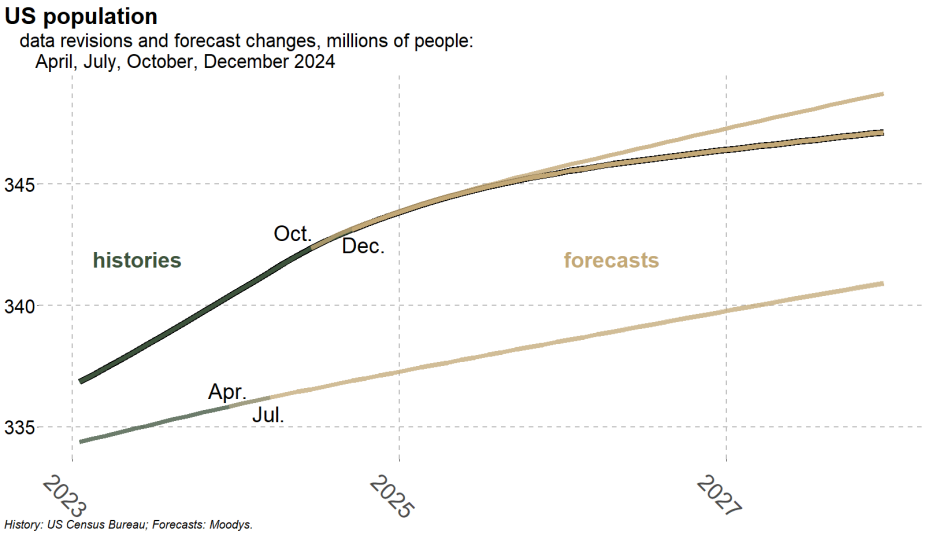
Forecast analysis



Forecast comparison. The forecast from Moody's continues to evolve. We discuss a couple of data revisions and analyze the corresponding forecast trajectories across four forecasts: April, July, October, and December.

US forecasts. The outlook for GDP evolved across 2024. Part of this is due to data revision by the Bureau of Economic Analysis. GDP data was revised in the summer.[10] The revision between the April outlook and the July outlook was a typical revision. Data largely came in as expected for the near-term; this is reflected in the overlap between the first quarter of forecast in the April edition and the last quarter of history in the July edition. Even though the near-term met the previous expectation, other data revisions or statistical updating across those three months produced a slightly weaker trajectory for real GDP. However, the trajectory stayed largely intact.

The BEA revision lifted GDP history for the October and December forecasts by Moody's. The October forecast largely accepted the data revisions and proceeded to adhere to the same type of trajectory envisioned in the earlier months of 2024. With the December edition, although the additional data again met the expectation laid out in October,[11] the forecast for real GDP was significantly revised downward; the trajectory is no longer parallel to that envisioned in the earlier editions. This revision comes after the outcome of the 2024 election was known.



The revision to real GDP is partly explained by the revision to the outlook for population. In real GDP

[10] See the base of page 4 of https://www.bea.gov/sites/default/files/2024-09/gdp2q24-3rd.pdf.

[11] see where the overlap between the first quarter of forecast for the October edition is met by the first quarter of history recorded in the December edition

there is also a data revision across the past year, and again there is a revision to the trajectory of the forecast. In this case, the revision is quite dramatic. This plot shows that the new population estimates from the Census Bureau revised upwards the number of people living in the US. The revision is a reflection of stronger immigration into the country. The revision subsequent to the election likely reflects differing immigration policy expected from the next federal administration. Notice that the difference in population totals in 2027 are about 1 million; these revisions represent a change in the US population akin the removal of a mid-sized, but nationally known, city.

Here is a table summarizing changes to the forecast across the past calendar year.

Dec. '24 forecast		**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
GDP	b (2017) $	22,671	23,300	23,821	24,201	24,634	25,150	25,721
P. income	b $	23,403	24,684	25,774	26,926	28,062	29,196	30,480
Population	m	339	342	345	346	347	348	348
Nonfarm	m ct.	156	159	160	161	161	162	162
Wages	b $	11,725	12,421	12,994	13,582	14,111	14,575	15,116
Oct. '24 forecast		**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
GDP	b (2017) $	22,671	23,278	23,804	24,296	24,818	25,384	25,958
P. income	b $	23,010	24,080	25,070	26,170	27,360	28,610	29,890
Population	m	335	337	338	339	341	342	343
Nonfarm	m ct.	156	157	158	158	159	160	160
Wages	b $	11,830	12,480	13,010	13,530	14,070	14,630	15,210
Jul. '24 forecast		**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
GDP	b (2017) $	22,377	22,896	23,286	23,719	24,239	24,813	25,388
P. income	b $	22,961	24,043	25,072	26,150	27,316	28,582	29,887
Population	m	335	337	338	339	340	342	343
Nonfarm	m ct.	156	159	160	160	161	161	162
Wages	b $	11,798	12,388	12,956	13,469	14,001	14,559	15,136
Apr. '24 forecast		**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
GDP	b (2017) $	22,380	22,960	23,340	23,780	24,300	24,870	25,440
P. income	b $	22,980	24,110	25,130	26,210	27,380	28,630	29,920
Population	m	335	337	338	339	340	342	343
Nonfarm	m ct.	156	158	159	160	161	161	162
Wages	b $	11,820	12,470	13,030	13,550	14,090	14,650	15,230
Jan. '24 forecast		**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
GDP	b (2017) $	22,340	22,710	23,100	23,620	24,180	24,770	25,340
P. income	b $	23,010	24,080	25,070	26,170	27,360	28,610	29,890
Population	m	335	337	338	339	341	342	343
Nonfarm	m ct.	156	157	158	158	159	160	160
Wages	b $	11,830	12,480	13,010	13,530	14,070	14,630	15,210

ID forecasts. Idaho's forecast is also subject to revised history. The Census Bureau's estimate for population in 2023 was raised by about 7 k people when the July 2024 estimate was released in December 2024. That estimate showed July 1, 2024 as the state having just crossed the 2 million resident threshold. These new data are incorporated in the accompanying table; the population line refers to July 1 estimates for each year. It is likely that 2027, as early as August or September of that year, may be the time Idaho the crosses the 2.1 million resident count.

Dec. 24 forecast		**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
P. income	\$ m	116,676	124,665	134,234	142,182	150,349	159,992	170,651
Wages	\$ m	50,513	54,340	58,792	62,858	67,058	71,457	76,226
Population	ct	1,971,122	2,001,619	2,034,195	2,064,203	2,094,737	2,126,478	2,159,336
Nonfarm	jobs	818,518	841,982	870,557	887,699	904,283	922,678	942,519
Oct. '24 forecast		**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
P. income	$ m	116,676	124,832	133,868	141,921	150,097	159,283	169,290
Wages	$ m	50,513	54,076	58,025	61,838	65,825	70,094	74,668
Population	ct	1,964,726	1,991,348	2,019,872	2,047,359	2,075,422	2,104,274	2,133,907
Nonfarm	jobs	818,518	840,033	867,123	886,606	905,587	924,950	944,596
Jul. '24 forecast		**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
P. income	$ m	115,750	120,575	126,639	134,344	142,160	150,626	159,616
Wages	$ m	50,843	54,349	58,040	61,309	64,526	67,761	71,207
Population	ct	1,964,726	1,991,425	2,018,403	2,044,996	2,072,399	2,100,652	2,129,620
Nonfarm	jobs	818,518	840,373	860,568	876,062	892,089	908,773	925,438
Apr. '24 forecast		**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
P. income	$ m	115,989	119,352	127,203	134,696	142,130	150,133	158,693
Wages	$ m	51,051	54,567	58,339	61,798	65,347	69,056	73,105
Population	ct	1,964,726	1,992,911	2,019,231	2,045,836	2,073,301	2,101,656	2,130,765
Nonfarm	jobs	818,458	846,999	864,081	879,665	896,095	913,435	931,017
Jan. '24 forecast		**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	
P. income	$ m	114,900	122,776	129,867	137,495	145,156	153,868	
Wages	$ m	51,170	55,026	58,604	61,994	65,546	69,379	
Population	ct	1,988,810	2,008,714	2,038,713	2,062,648	2,081,655	2,098,946	
Nonfarm	jobs	843,117	877,558	901,856	920,909	936,845	952,591	

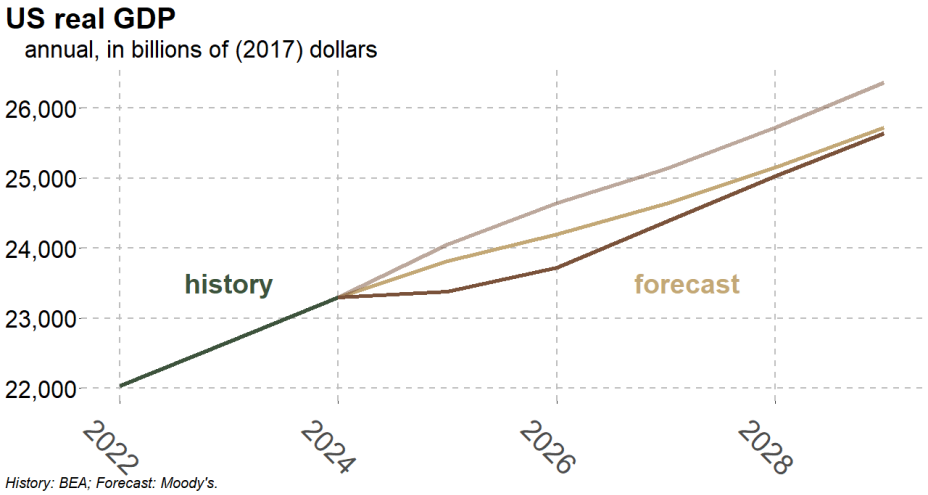
Total personal income continues to grow quite consistently; there are many stabilizing factors in its composition. Wages form the base of that figure, but transfer payments (such as social security) and supplements to wages (such as healthcare benefit values), as well as things more traditionally thought of as income (such as dividends, interest, and rent) help to stabilize the trajectory for personal income. The overall trajectory remains one of expansion within wages, and the same is replicated in most all of these stabilizing portions of personal income.

Baseline is the median forecast for Moody's. We discuss an upside as well as a downside case.

Alternative forecasts. The baseline forecast, being the median forecast from Moody's, has a particular meaning. It represents the mid-point of the scenarios that Moody's envisions as reasonably likely paths for the economy. The alternative scenarios, particularly those that Moody's characterizes as downside cases, represent plausible paths for the economy, but they each involve timing choices to initiate their deviation from the baseline. Many of these downside scenarios are triggered "immediately." This means, in the case of the downside scenario presented here, that the deviation from baseline begins in January 2025 since the forecast is the December 2024 edition from Moody's.

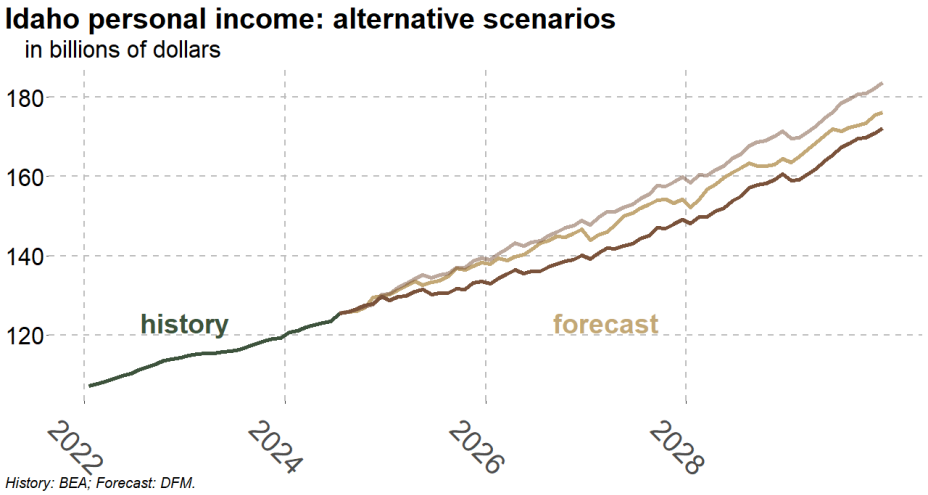
The value of the downside scenarios is that they represent the scope of what a downside could entail. The timing issues of these scenarios beginning immediately are of much less value in the uses that DFM puts them to. In particular, the use of the economic (jobs, wages, personal income, housing, etc.) forecast is to produce revenue forecasts for the state. The baseline revenue forecast is the one presented to the governor and the legislature. The alternative forecasts primarily give an indication as to the scope of likely revisions should those become necessary. Those revision estimates from the alternatives inform the likely magnitudes of revenue forecast revisions to be expected when a subsequent revenue forecast is made, such as in August when the revision to the January forecast is released. Thus the alternative forecasts provide a planning tool to state leaders.

US trajectories. The downside scenario presented here is the mildest one that Moody's details. It entails a two- to three-quarter mild recession beginning in the first quarter of 2025. Jobs recover to the 2024 level by late 2026, but full employment only occurs in the first quarter of 2027. Home prices (median, of existing single-family homes) decline in 2025 and only recover the nominal (not inflation adjusted) values from 2024 in early 2028. Taking account of inflation, they would still be about 8% lower in 2028 than the median in 2024.



Idaho		2022	2023	2024	2025	2026	2027	2028	2029
Nonfarm jobs	baseline	798,120	818,520	841,980	870,560	887,700	904,280	922,680	942,520
	pessimistic	798,120	818,520	842,000	856,400	867,570	888,610	911,100	933,110
	optimistic	798,120	818,520	841,980	875,020	898,040	918,340	938,370	959,410
Wages, m $ (ID DoL)	baseline	43,521	46,317	50,122	54,505	58,465	62,559	66,857	71,522
	pessimistic	43,521	46,317	50,123	53,460	56,569	60,613	65,046	69,876
	optimistic	43,521	46,317	50,122	54,941	59,616	64,312	69,122	74,321
Housing stock	baseline	782,658	803,433	821,869	839,099	858,706	879,546	901,527	924,646
	pessimistic	782,658	803,433	821,869	839,025	858,184	878,602	900,284	923,272
	optimistic	782,658	803,433	821,869	839,100	858,737	879,786	902,170	925,938

Idaho trajectories. The outlook for Idaho for the baseline is slightly lower than midway between the pessimistic and optimistic trajectories, at least by the close of the forecast period in 2029: the midpoint would be 946 k jobs, so the baseline would be just under 3 k jobs below that midpoint (about 0.4%). This is not unexpected. The upside scenario is the 90th-percentile one, while the downside scenario is the 25th-percentile one. For wages, the outlook is a bit wider. The mean of the two alternatives places Department of Labor measured wages in 2029 at $72,100, so the baseline is just $600, or about 0.8%, shy of that. For housing, though, the outlooks are quite similar. Baseline and the midpoint of the two alternatives differ by less than 50 units in 2029 (0.0% difference).



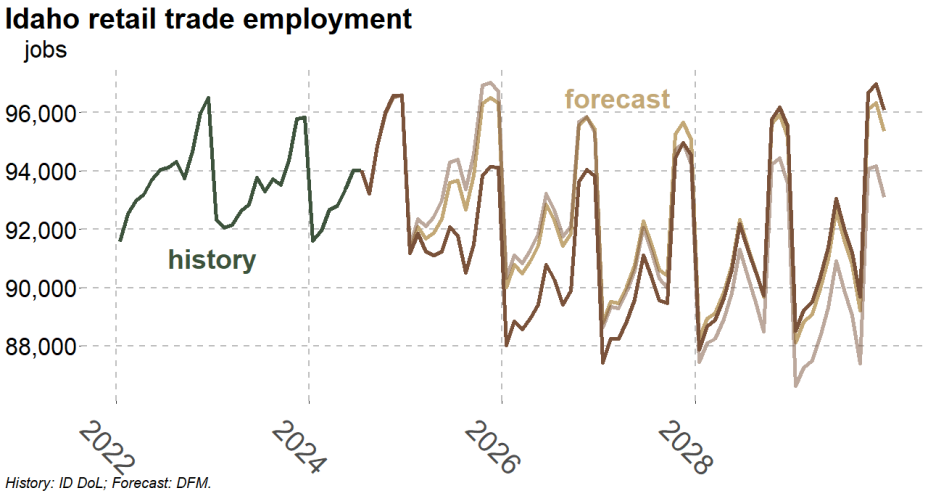
Overall, the outlook for Idaho is nicely summarized by the trajectories of personal income under the three scenarios. Note that while GDP for the nation has the pessimistic and baseline outlooks nearly converging, for Idaho, personal income, which is a decent proxy for gross state product, maintains more distinct trajectories. The baseline remains notably above the pessimistic through the forecast horizon of 2029.

Of course, the route to those nearly common endpoints is varied. The recession in the Moody's 25th-percentile downside scenario begins immediately and lasts three quarters of a year. Jobs within the state are 20 k fewer in 2026 on average due to the scenario of a national slowdown. Wages paid in the state would be $1.9 b fewer in 2026 as well. The upside scenario brings instead over 10 k more jobs in the state in 2026 than the baseline, and wages paid would be over $1.1 b more than in the baseline. These differences would, of course, have consequences for state revenues.

In context, though, they are not enormous. The downside removes about 3% of wages while the upside adds about 2% of wages. Idaho's zero tax bracket together with the standard deductions, however, would soften both of those changes as undoubtedly some of those wages paid would be to people who would not have a state tax liability in 2026.

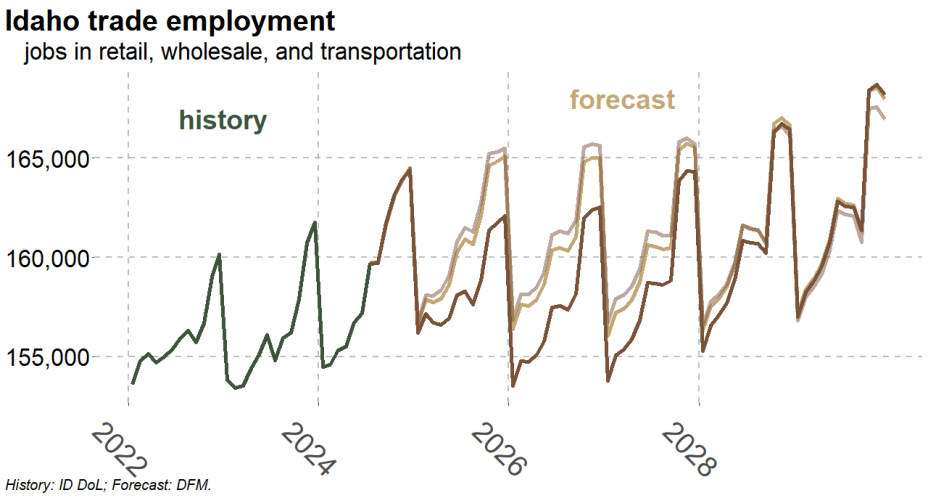
Trade news. The planned merger between Albertsons and Kroger did not go through. This had been one of the larger risks to the retail trade employment forecast. While the proposed merger would have sold some Idaho stores to a grocery wholesaler, there was the possibility that those stores may not have been able to maintain employment in the medium term. Details of the corporate office change would have been another possible source of Idaho employment uncertainty in the event of the merger.

While uncertainty is not erased with the cancellation of the merger,[12] it is more likely that any changes in employment by either firm within Idaho are going to be rather gradual. Hence the risk to the employment forecast is lower as several intervening forecast are likely to have an opportunity to assess the change as they unfold, if indeed, there are any such changes.



Trade. In the event of a downturn, particularly a mild recession like the 25th-percentile pessimistic case presented by Moody's, one of the primary conduits of the malaise is a tempering of consumer behavior. This reflects in the jobs numbers associated with the trade sector, particularly retail trade. In the case presented here, we can see the drop-off in the seasonal pattern for retail trade extending through 2025 through a good portion of 2027 before a recovery sets in. At that point, the optimistic and the pessimistic scenarios trade places in terms of the high- and low-employment scenarios for the retail trade sector. Overall, the retail trade sector is likely to have peak employment very similar to those periods already observed in 2023 and 2024: near 95 to 96 k jobs. Fluctuations across the year already regularly entail 4 k jobs differentials between the low employment months and the peak employment months. The downside scenario would see twice that as a dip, and generally across the forecast, there is greater volatility expected: differentials of 6–8 k jobs within a year's span are quite possible according to the model.

[12] The merger was called off due to court cases brought by attorney generals in other states as well as by the Federal Trade Commission.



Looking at the broader trade sector, encompassing both retail and wholesale trade as well as transportation, the outlook across the scenarios is a bit more concentrated. The baseline and the optimistic and pessimistic scenarios are not far apart. Comparing this broader view of trade with retail trade by itself, the job changes associated with the pessimistic scenario are highly concentrated within the retail trade sector. Wholesale trade and transportation fare reasonably well within the moderate downturn. Further, we see that the stalling pattern visible within the retail trade sector is not replicated at the broader trade sector. Peak employment is expected to continue to expand in both the baseline and the optimistic scenarios, and after a pause, within the pessimistic scenario as well (in 2028 and 2029, the peaks for baseline and pessimistic are quite similar for the broader trade sector).

Look ahead. At this point, Moody's has make a preliminary assessment of some of the policy changes that the new federal administration is likely to pursue. It is expected that by the April edition of this report, fuller details on those possible policy changes will be better known and modeled, and that some may have already occurred or be within the pipeline. In the latter case, the timing of such policy changes would be better incorporated within the national outlook, and hence within the data that goes into the Idaho economic model. A particular interest will be in a greater understanding of the likely federal tax law changes, particularly those pertinent to the individual income tax. Under current law, the large standard deductions that individuals have enjoyed since 2018 are set to expire. That is just one part of the many moving parts which would (absent federal action) change what is taxable income going forward. As Idaho typically conforms to federal standards for adjusted gross income (AGI), some of the federal changes (whatever they may be) are likely to flow into Idaho income tax considerations.

Appendix

US Macroeconomic Model by Moody's Analytics

Moody's model is a structural model based upon the IS-LM demand model and the Phillips curve for supply. It has about 2,300 variables forecast in their macroeconomic model, with more than 9 in 10 determined within the model (i.e., endogenously, rather than exogenously, or external to the model.) The firm also characterizes the model as a Keynesian model, with short-term fluctuations largely driven by demand. The firm indicates that substantial shocks can take up to two years to unwind back to an equilibrium path.

There are some particular variables which are central in the model. Moody's says:

> The federal funds rate's effect in the model is systemic. It affects the yield curve, which is critical to consumer spending and business investment. Therefore, it affects real GDP growth, the labor market, and inflation.

To illustrate why shocks may take time to dissipate in the model, Moody's also indicates:

> Monetary policy operates with a lag in the model. Eventually the model's inflation and unemployment rate forecasts return to equilibrium, and the federal funds rate follows.

Monetary policy includes setting and adjusting the federal funds rate, but it also includes other tools that the Federal Reserve has. A recent example of this has been both Quantitative Easing (during the acute phase of the pandemic), and its opposite, Quantitative Tightening (during 2022–present).

Moody's organizes its model into blocks: These include

(1) Consumption through consumer spending
(2) Investment
(3) International trade[13]
(4) Fiscal policy
(5) Supply (labor force potential, for example)
(6) Inflation
(7) Monetary policy and its transmittal
(8) Personal Income
(9) Corporate income
(10) Labor markets (actual employment by sector)
(11) Housing

Moody's provides a detailed look at parts of each of these blocks in their model. Doing so takes the firm 25+ pages. To not extend the length of this publication, we will take only a couple of these for further discussion. The few we do are quite parallel to the Idaho economic model.

Moody's indicates that their model is anything but static, much as the US economy.

[13] Moody's emphasises trade in their model.

> Rarely does a month go by when no changes are made to the model. Equations that are no longer performing well are re-specified, and variables are occasionally added to the model as more data become available or the dynamics of the economy change.

Their wording here also applies to the Idaho economic model.

5 Supply means the long-term economic potential of the US. It is goverened by innate parts of the economy, including population forecasts. As we have learned, it is difficult to find labor without having a population of workers appropriate for the labor, in location, age, skill, and desire to work. Moody's says;

> Labor force supply is a key determinant of potential GDP, which largely depends on demographics. Population is estimated based on Census Bureau birth and death rates and immigration rates that are determined by the economic performance of the U.S. relative to the rest of the world.

Here we see a couple of potential exogenous variables in the Moody's model, namely the data coming from Census Bureau estimates. We also see that each block can and does interact with other blocks in the Moody's model: here international trade interacts with the population portion of the supply block though the strength of the immigration draw that the US economy represent, or will represent in the future.

Another input in the potential labor force is an estimate of what is called the Non-Accelerating Inflation Rate of Unemployment (NAIRU). This concept is a Phillips curve one: if unemployment rates are too low, inflation is expected to not only be present, but to increase in rate. Such a situation is one that the Federal Reserve works to prevent. One of its two charges by Congress is stable prices; that is, the Fed must not allow accelerating inflation to persist. Thus the NAIRU is important for understanding potential labor force; it is not as simple as computing the 16–64 year-olds in the US. NAIRU is another example of an exogenous variable. In this case:

> We use the [Congressional Budget Office] CBO's long-term NAIRU forecast and make that variable exogenous in our model. We then specify an error correction model to predict the value of short-term NAIRU.

This also indicates that parts of Moody's model may have equations of varying types. We have already seen that Moody's employs demographic models to estimate population. These are different from the Ordinary Least Squares (OLS) equations, which dominate the Labor block 10 of Moody's model.

8 The Personal Income block is illustrative of the pervasiveness of Bureau of Economic Analysis data organization across almost all economic forecasts. Principal parts are wage and salaries, supplements to wages and salaries (that is the BEA name; largely this is benefits such as health insurance), dividends, interest, and rent (modeled separately), and proprietors' income.

> Individual wage and salary categories are modeled as functions of industry employment, industry average hourly earnings, and a broad measure of hours worked.

The personal income block certainly interacts with the labor market block 10. Another interaction is present with the Inflation block 6. While industry average hourly earnings are used for each industry, behind the scenes is average hourly earnings in all private industries. Forecasting that broad measure is "the most important wage equation in the macroeconomic model," though Moody's makes this statement within their discussion of the Employment Cost Index, in order to understand CPI inflation.

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.

These have historically been estimated at the quarterly frequency as that is the frequency of data provided by IHS Markit (our prior provider of the US forecast) as well as Moody's (our current provider of the US forecast). Some of the source data is available at the monthly frequency. Examples of this include personal income for the US (source: BEA), inflation as measured by the Consumer Price Index (CPI inflation, source: BLS), and local employment (source: Idaho Department of Labor — available in quarterly batches of monthly measurement). We are now running parallel monthly frequency level. Where source data is available at the monthly level, it is used[14] and where it is not readily available for our own collection, the monthly version from Moody's is used.

The primary exogenous variables are obtained from the national forecast provider (now Moody's). Endogenous variables are forecast at the state level.

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

> **personal income = wage and salary payments + other labor income + farm proprietors' income + nonfarm proprietors' income + property income + transfer payments - contributions for social insurance + 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[15][16] 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 North American Industry Classification System employment categories (NAICS). 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

[14] the quarterly values recorded by the US forecast provider have always been the average values for the corresponding months

[15] As the exogenous variables for the farm model are only available at the annual frequency, the farm model is now computed at that frequency, and monthly values are interpolated from these. The source for the exogenous regressors in the farm model is the FAPRI institute of the University of Missouri, Columbia.

[16] The US Bureau of Economic Analysis has a note indicating that farm income data at the state level has been discontinued; see BEA discontinuation of SAINC45 In the coming publications, DFM will re-model this portion of the computation.

demand variables. Average wage rates are estimated for each of these 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. We model housing starts on permits based upon equations estimated for the Western US, and for completions upon starts in a similar manner. These are then used to forecast housing stock, which is also estimated by the US Census Bureau. In this last step, we have a check on our housing model.

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.

Like in Moody's US economic model, most equations are specified in log form. This is generically

$$\log(y) = c_0 + c_1 \cdot \log(x_1) + \cdots + c_n \cdot \log(x_n)$$

which means that

$$y = e^{c_0} \cdot x_1^{c_1} \cdots x_n^{c_n} .$$

These mathematical forms are sufficient to enable good fits of the data without overly complicated equations. This helps to avoid "over-fit", which can precipitate small changes of the inputs redirecting the output in unreasonable directions.

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 Moody's US macroeconomic models.

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

Idaho Time Series Model. The Idaho Time Series Model (ITS)[17] is a new numeric model of Idaho's economic activity. The model consists of sequential equations solved in modules with dependencies such that downstream modules can rely on data forecasted in earlier modules. The regression equations are estimated using time series forecasting techniques covered by the R 'seasonal' package. The package uses the X-13 ARIMA-SEATS method to understand the typical monthly or quarterly trend from data before creating a forecast. The method is a joint development by the US Census Bureau, Stats Canada, and the Bank of Spain. ARIMA models are time-series models, which means they look to prior measurements of a variable in order to understand subsequent measurements of that *same* variable.[18]

The guiding principal of the time series model is to let the data speak for itself and involve exogenous regressors sparingly. Several equations in the model, such as the adult share of the population, are computed exclusively as ARIMAs with no exogenous regressors. Fewer than five equations in the model use more than two exogenous regressors. Time series models tend to produce accurate forecasts, but without the linkages of multiple regression models like the IEM. For time series forecasts it can be difficult to explain why a forecast is evolving in a particular way.

The first module estimates monthly values for Idaho births, deaths, and net migration and combines these to get a measure for monthly change in population. This contrasts with the IEM which treats migration as a residual. The only exogenous regressors used in this portion of the ITS model are mortgage rates, the US unemployment rate, a dummy for COVID-19, and Idaho housing completions, which are provided by Moody's.

The population estimate feeds into the second module, which then estimates values for the monthly adult population, labor force, and employed persons before estimating monthly levels of employment across the standard employment sectors into which the BEA divides the US economy. To do so, this second module begins by using the population number to create forecasts of the total number of adults, the size of the labor force, and then the number of employed persons.[19] These forecasts rely on Local Area Unemployment Statistics (LAUS, a BLS program) numbers.

Once the labor force is understood, the second module continues by using separate regressions for each major NAICS sector, this time using data from the quarterly Current Employment and Wages (QCEW, another BLS program). An "other" category trues these values up to the total number of employed (since LAUS and QCEW use different definitions). This portion of the

[17] The ITS was pioneered by Matthew Hurt; it has been used for the past year+ in forecasting revenue in a blended model with the IEM. Further integration with this report is the next aim.

[18] An example may be illustrative: an ARIMA forecast of housing would look at prior housing permit activity to predict future housing permit activity; a general regression analysis might look towards population trends to predict future housing permit activity. Both can have merits, and a combination of the methods is often used, though one or the other may be the dominant driver in any particular equation analysis, say the equation analysis of housing permits. The population trends in the second approach are an example of an exogenous regressor for housing starts — they are variables which can be supplied externally from the internal computations of the housing permit equation.

[19] Once the employed number and the labor force number are known, the unemployment rate is easily found: the difference between these gives the unemployed count, and dividing by the labor force number gives the unemployment rate.

second module, focusing on employment categories, uses mortgage rates, the US unemployment rate, the US labor force participation rate, the federal funds rate, and CPI as exogenous regressors. However, each individual regression relies at most on two of these exogenous regressors.

The third model estimates wage rates and wagebills for each of the NAICS categories. The IEM and ITS dis-aggregate labor markets in a similar manner, although the ITS has a finer breakdown. One example is the commonly grouped categories such as 22, 48, and 49 (utilities, and transportation sectors), which the ITS keeps fully separate. The principal data for employment and wages come from the Quarterly Census of Employment and Wages (QCEW). The total QCEW wagebill is the ultimate target, as it is a vital exogenous regressor used in the subsequent personal income and GDP modules.

To get to that total QCEW wagebill, separate wagebills for each NAICS category are computed. These wagebills come about as the product of wage rates and employment numbers. Wage rates are estimated via time-series regression for each NAICS category using the unemployment rate in Idaho and the corresponding national wagerates for each NAICS sector.

The first modules all run on monthly data. If exogenous data come from Moody's on a quarterly basis, the ITS first smooths these data to monthly values and then performs the forecast. The personal income and GDP modules rely on quarterly data. When data is imported from earlier modules in the ITS, these data are monthly, so both the personal income and the GDP modules average the monthly data to obtain quarterly data, and these two modules are run. Currently the GDP module is only for state-level real GDP and only uses the total wagebill as an exogenous regressor. The personal income module forecasts many components of personal income and uses the total wagebill in addition to some of the previously described exogenous regressors.

Variables. It is likely that the choice of variables will change slightly across the next two years. Partly this may reflect removal of what amount to essentially duplications. Partly this may reflect better integration of the components of the model; like Moody's US model, the Idaho economic model is structured in modules or blocks.

Endogenous variables: These are computed within the Idaho economic model.

id_pi	Idaho personal income
id_supp	Idaho supplementary income
id_dir	Idaho dividends, interest, and rent
id_nonfarm_prop	Idaho nonfarm proprietors' income
id_transfer	Idaho transfer payments
id_ra	Idaho residence adjustment
id_si	Idaho social insurance
id_e1133	Idaho employment in wood products industries
id_mwr1133	Idaho monthly wage rates in wood products industries
id_mwb1133	Idaho monthly wage bill in wood products industries
id_e21	Idaho employment in mining
id_mwr21	Idaho monthly wage rates in mining
id_mwb21	Idaho monthly wage bill in mining
id_e22	Idaho employment in utilities
id_mwr22	Idaho monthly wage rates in utilities
id_mwb22	Idaho monthly wage bill in utilities
id_e23	Idaho employment in construction
id_mwr23	Idaho monthly wage rates in construction
id_mwb23	Idaho monthly wage bill in construction
id_e31	Idaho employment in food manufacturing
id_mwr31	Idaho monthly wage rates in food manufacturing
id_mwb31	Idaho monthly wage bill in food manufacturing
id_e32	Idaho employment in other nondurable manufacturing
id_mwr32	Idaho monthly wage rates in other nondurable manufacturing
id_mwb32	Idaho monthly wage bill in other nondurable manufacturing
id_e33	Idaho employment in durable manufacturing
id_mwr33	Idaho monthly wage rates in durable manufacturing
id_mwb33	Idaho monthly wage bill in durable manufacturing
id_e42	Idaho employment in wholesale trade
id_mwr42	Idaho monthly wage rates in wholesale trade
id_mwb42	Idaho monthly wage bill in wholesale trade
id_e44	Idaho employment in retail trade
id_mwr44	Idaho monthly wage rates in retail trade
id_mwb44	Idaho monthly wage bill in retail trade

id_e45	Idaho employment in other retail trade
id_mwr45	Idaho monthly wage rates in other retail trade
id_mwb45	Idaho monthly wage bill in other retail trade
id_e48	Idaho employment in transportation
id_mwr48	Idaho monthly wage rates in transportation
id_mwb48	Idaho monthly wage bill in transportation
id_e49	Idaho employment in delivery and warehousing
id_mwr49	Idaho monthly wage rates in delivery and warehousing
id_mwb49	Idaho monthly wage bill in delivery and warehousing
id_e51	Idaho employment in information
id_mwr51	Idaho monthly wage rates in information
id_mwb51	Idaho monthly wage bill in information
id_e52	Idaho employment in finance and insurance
id_mwr52	Idaho monthly wage rates in finance and insurance
id_mwb52	Idaho monthly wage bill in finance and insurance
id_e53	Idaho employment in real-estate
id_mwr53	Idaho monthly wage rates in real-estate
id_mwb53	Idaho monthly wage bill in real-estate
id_e54	Idaho employment in professional services
id_mwr54	Idaho monthly wage rates in professional services
id_mwb54	Idaho monthly wage bill in professional services
id_e55	Idaho employment in management
id_mwr55	Idaho monthly wage rates in management
id_mwb55	Idaho monthly wage bill in management
id_e56	Idaho employment in administrative services
id_mwr56	Idaho monthly wage rates in administrative services
id_mwb56	Idaho monthly wage bill in administrative services
id_e61	Idaho employment in private education
id_mwr61	Idaho monthly wage rates in private education
id_mwb61	Idaho monthly wage bill in private education
id_e61gsed	Idaho employment in state eduction
id_mwr61gsed	Idaho monthly wage rates in state eduction
id_mwb61gsed	Idaho monthly wage bill in state eduction
id_e61gled	Idaho employment in local education
id_mwr61gled	Idaho monthly wage rates in local education
id_mwb61gled	Idaho monthly wage bill in local education

id_e62	Idaho employment in private healthcare
id_mwr62	Idaho monthly wage rates in private healthcare
id_mwb62	Idaho monthly wage bill in private healthcare
id_e62gshl	Idaho employment in state healthcare
id_mwr62gshl	Idaho monthly wage rates in state healthcare
id_mwb62gshl	Idaho monthly wage bill in state healthcare
id_e62glhl	Idaho employment in local healthcare
id_mwr62glhl	Idaho monthly wage rates in local healthcare
id_mwb62glhl	Idaho monthly wage bill in local healthcare
id_e62gvfhl	Idaho employment in federal healthcare
id_mwr62gvfhl	Idaho monthly wage rates in federal healthcare
id_mwb62gvfh	Idaho monthly wage bill in federal healthcare
id_e71	Idaho employment in hospitality
id_mwr71	Idaho monthly wage rates in hospitality
id_mwb71	Idaho monthly wage bill in hospitality
id_e72	Idaho employment in arts
id_mwr72	Idaho monthly wage rates in arts
id_mwb72	Idaho monthly wage bill in arts
id_e81	Idaho employment in other services
id_mwr81	Idaho monthly wage rates in other services
id_mwb81	Idaho monthly wage bill in other services
id_e92gsad	Idaho employment in state administration
id_mwr92gsad	Idaho monthly wage rates in state administration
id_mwb92gsad	Idaho monthly wage bill in state administration
id_e92glad	Idaho employment in local administration
id_mwr92glad	Idaho monthly wage rates in local administration
id_mwb92glad	Idaho monthly wage bill in local administration
id_e92gvf	Idaho employment in federal administration
id_mwr92gvf	Idaho monthly wage rates in federal administration
id_mwb92gvf	Idaho monthly wage bill in federal administration
id_etribes	Idaho tribal employment
id_mwrtribes	Idaho monthly wage rates for tribal employment
id_mwbtribes	Idaho monthly wage bill for tribal employment
idp_sf	Idaho single-family housing permits
idp_mf	Idaho multi-family housing permits
ids_sf	Idaho single-family housing starts
ids_mf	Idaho multi-family housing starts
idc_sf	Idaho single-family housing completions
idc_mf	Idaho multi-family housing completions

wp_sf	western single-family housing permits
wp_mf	western multi-family housing permits
ws_sf	western single-family housing starts
ws_mf	western multi-family housing starts
wc_sf	western single-family housing completions
wc_mf	western multi-family housing completions
m_idhstk	monthly Idaho housing stock
id0npt	Idaho population
id0nb	Idaho births
id0nd	Idaho deaths
id0nmg	Idaho net migration
id_cow	Idaho income from cattle
id_crop	Idaho income from crops
id_dairy	Idaho income from dairy
id_farm_chem	Idaho farm expenditures on chemicals
id_farm_exp	Idaho farm expenditures
id_farm_gvt	federal transfers to Idaho farms
id_farm_other	other farm income
id_farm_petro	Idaho farm expenditures on fuels
id_farm_prop	Idaho farm proprietors' income
id_farm_receipts	total Idaho farm receipts
id_feed	Idaho farm expenditures on feed
id_hay	Idaho income from hay and related feeds
id_lvstk	Idaho income from livestock
id_seed	Idaho farm expenditures on seed
id_veg	Idaho farm income from vegetables
id_wheat	Idaho farm income from wheat
id_farm_corp	corporate farm income in Idaho
id_farm_inv	Idaho farm inventory change
us_farm_corp	corporate farm income in the US
us_farm_inv	US farm inventory change
us_cow	US farm income from cattle
us_farm_exp	US farm expenditures
us_farm_other	other US farm income
us_farm_petro	US farm expenses on fuel
us_farm_prop	US farm proprietors' income
us_farm_receipts	total US farm reciepts
us_hay	US farm income from hay and related feeds
us_lvstk	US farm income from livestock
us_veg	US farm income from vegetables
us_wheat	US farm income from wheat

Exogenous variables: These are imported into the Idaho economic model from outside sources.

cpi	consumer price index
dum_id_e1133_a	employment dummy for wood products
dum_id_e21	employment dummy for mining
dum_id_e23	employment dummy for construction
dum_id_e44	employment dummy for retail trade
dum_id_e45	employment dummy for other retail trade
dum_id_e48	employment dummy for transportation
dum_id_e49	employment dummy for delivery and warehousing
dum_id_e53	employment dummy for real-estate
dum_id_e56	employment dummy for administration
dum_id_e61gled	employment dummy for local education
dum_id_e61gsed	employment dummy for state education
dum_id_e62gshl	employment dummy for state healthcare
dum_id_e71	employment dummy for hospitality
dum_id_e72	employment dummy for arts
dum_id_farm_other	employment dummy for other farm income
dum_id_farm_prop	employment dummy for farm proprietors' income
dum_id_farm_receipts	employment dummy for total farm receipts
dum_id_lvstk	employment dummy for farm income from livestock
dum_id_mwr1133	employment dummy for woods products wage rates
dum_id_mwr23	employment dummy for construction wage rates
dum_id_mwr33	employment dummy for durable manufacturing wage rates
dum_id_mwr62	employment dummy for healthcare wage rates
dum_shift_id_farm_corp	employment dummy for corporate farm income
dum_shift_id_farm_inv	employment dummy for farm inventories
dum_shift_us_farm_corp	employment dummy for corporat farm income
ffr	federal funds rate
gdp_farm	GDP from the US farm sector
gdpr	real US GDP
hhaf	household financial assets
hhao	other household assets
ip321	industrial production index for wood products
ip322	industrial production index for paper manufacturing
ip334	industrial production index for semi-conductor industry
ip335	industrial production index for electrical equipment
jpc	personal consumption expenditure inflation

lfpr	US labor force participation rate
mf_farm_pi_af	Moody's farm personal income from all products
mf_farm_pi_lp	Moody's farm personal income from livestock
mf_gdp_farm	Moody's farm GDP
mf_idp_sf	Moody's Idaho single-family permits
mf_idp_mf	Moody's Idaho multi-family permits
mf_ppi_farm	Moody's producer price index for farm products
mf_ppi_metals	Moody's producer price index for metals
mf_us_mwr23	Moody's monthly wage rates in construction
mf_us_mwr42	Moody's monthly wage rates in wholesale trade
mf_us_mwr44_45	Moody's monthly wage rates in retail trade
mf_us_mwr51	Moody's monthly wage rates in information
mf_us_mwr52	Moody's monthly wage rates in finance
mf_us_mwr53	Moody's monthly wage rates in real-estate
mf_us_mwr54	Moody's monthly wage rates in professional services
mf_us_mwr55	Moody's monthly wage rates in management
mf_us_mwr56	Moody's monthly wage rates in administration
mf_us_mwr61	Moody's monthly wage rates in private education
mf_us_mwr62	Moody's monthly wage rates in healthcare
mf_us_mwr71	Moody's monthly wage rates in hospitality
mf_us_mwr72	Moody's monthly wage rates in arts
mf_us_mwr81	Moody's monthly wage rates in other services
mf_us_mwrndmf	Moody's monthly wage rates in nondurable manufacturing
mf_us_mwrtw	Moody's monthly wage rates in transportation and warehousing
mf_us_mwrgvsl	Moody's monthly wage rates in state and local government
minwage	Moody's forecast for the minimum wage
month	1–12
pmms	average 30-year mortgage rates
productivity	Moody's index for productivity
trend	an increment increasing by 1 each month
u3_nsa	the US U-3 unemployment rate, not seasonally adjusted
us_crop	US crop income
us_dairy	US dairy income
us_div_int	US dividends, interest, and rent income
us_e1133	US employment in wood products
us_e22	US utilities employment
us_e23	US construction employment
us_e42	US wholesale trade employment
us_e44_45	US retail trade employment
us_e52	US finance employment
us_e53	US real-estate employment
us_e56	US management employment

us_e61	US private education employment
us_e62	US healthcare employment
us_edmf	US durable manufacturing employment
us_egvf	US federal government employment
us_egvsl	State and local government employment across the US
us_endmf	US non-durable manufacturing employment
us_etw	US employment in transportation and warehousing
us_farm_chem	US farm expenditures on chemicals
us_farm_gvt	government transfers to US farms
us_feed	US expenditures on farm feeds
us_nonfarm_prop_mf	Moody's forecast of US nonfarm proprietors' incomes
us_pop_tot	US population
us_rent	US income from rent
us_seed	US farm expenses for seed
us_si	US social insurance
us_supp	US supplementary income
us_transfer	federal transfer payments
us_wb_tot	total wages in the US