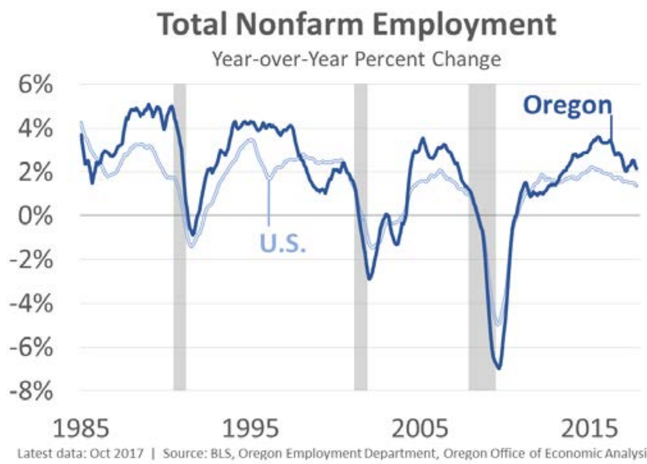
consists of policies like tax base broadening, health care reform, federal land policies including Canadian lumber tariffs, and international trade wars that are expected to have a larger impact on Oregon than seen in the typical state. What has changed in recent months is the fact that both the U.S. House and Senate have put forth tax reform legislation. See the Revenue Outlook section of this forecast for more information.

U.S. Bottom Line: All told the economic expansion is expected to continue. Economists see few worrisome signs in the data. That said, along with progress does come growing pains. As the economy approaches full employment and begins operating at capacity, which is likely to occur in the next year or so, it will begin to hit some of supply constraints. Should the constraints bind severely enough, or policymakers do not act to help correct the issues, they may tip the economy back into recession sooner than some expect. That said, the U.S. economy is beginning to hit the sweet spot like Oregon has in recent years. Employment and participation rates are rising some and wages continue to pick-up. As such household incomes are rising again and poverty rates are falling. These trends are largely expected to continue between now and the next recession.

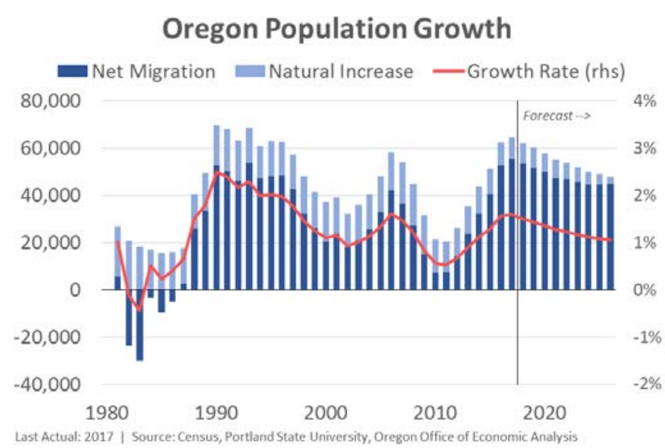
Oregon Economy

Oregon's expansion continues to outperform the typical state due to our industrial structure and ability to attract and retain young, working-age households. While local job growth has slowed since the full-throttle rates seen in 2014 and 2015, Oregon is still outpacing the nation overall.



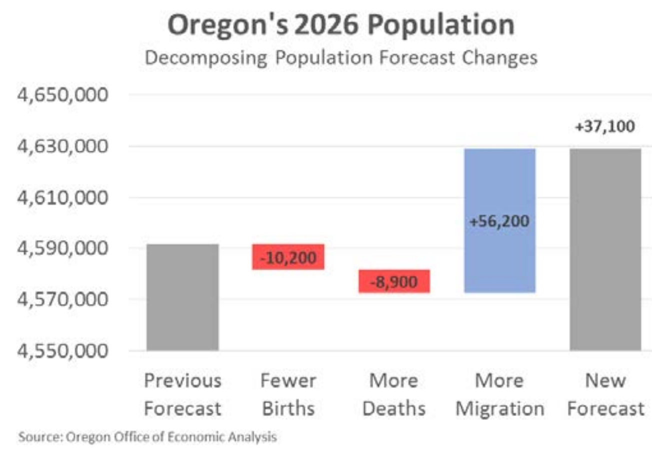
As the Oregon labor market is at, or near, full employment a few key trends emerge. The most important trend for Oregonians are the rising household incomes in recent years. These gains are the result of putting more Oregonians back to work, an even larger increase in those working full-time, and layering on wage gains as well. The result, based on the latest Census data, is Oregon's median household income is now essentially on par with the median U.S. income. More importantly household incomes today, after adjusting for inflation, are as high, if not higher than those first seen in the late 1990s and mid-2000s. Provided the economic expansion continues, incomes for the typical household are likely to finally break through the stagnation seen in recent decades. Whether or not the upcoming breakthrough is permanent, or temporary will not be known until after the next recession, whenever it comes.

Over time, Oregon's primary economic advantage comes from the state's ability to attract young, working-age households. These new residents provide an ample supply of labor for years to come. As such, the annual population estimates from Portland State's Population Research Center are among the most important economic numbers that are released each year. 2017 estimates were recently released, and will be finalized and certified in the coming weeks.



Our office's expectations were for population growth to slow slightly in 2017. Instead, the new data show a slight acceleration from 2016 gains. That said, population growth does appear to be topping out for this cycle. The state is now welcoming as many new residents per year as we have seen in recent decades, but these increases represent lower growth rates given the population base is increasing over time.

Besides the population number itself, the composition of the gains matter as well. Even as expectations are for lower birthrates and rising death rates as the population ages, recent years have indicated these trends both here in Oregon and across the U.S. are even more pronounced than anticipated. Overall, Oregon's population forecast has been raised due to the strong migration figures in our updated outlook. However our office now expects even fewer births moving forward and more deaths than we did in our previous outlooks. This is not out of line or out of character relative to previous forecasts. However it does indicate that the state's strong migration trends are even more important going forward than currently believed. Should the migration trends fail to materialize, the longer-term economic outlook for Oregon will be revised lower.

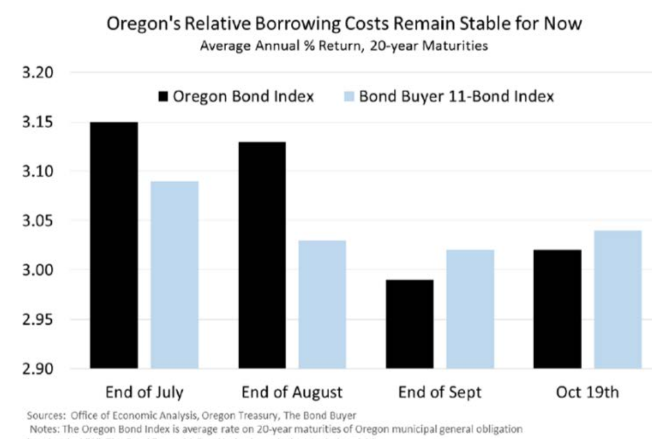


Wildfires: A Preliminary Economic Assessment

With a severe wildfire season just concluding in recent months, it is still too early to fully assess the damages. What follows is an overview of the potential channels in which some of the economic problems may materialize in the future.

From a long-term perspective, the scariest potential impact of Oregon's 2017 wildfire season is that fewer households and investments may be attracted to the region moving forward. Oregon's primary comparative advantage remains its ability to draw skilled workers away from other states. To the extent that local quality of life has been reduced, or if Oregon is perceived as a riskier or costlier place to live and do business, this advantage will be less pronounced. Our office's long-run economic outlook would need to be lowered, if this were true.

Increased risk lowers growth prospects. If investors and households view Oregon as a riskier place, businesses, property owners, and governments will face higher costs moving forward. While it is still early given wildfire season ended not too long ago, interest rates spreads between Oregon's municipal bonds and bonds in other states have not widened. However this may not only reflect a stable Oregon outlook, but also heightened risk in other states following a severe hurricane season.



In terms of the lost forests, how valuable are they? The market value of timber is a natural place to start. However for a place that was never going to be logged, like the Gorge scenic area, log prices are somewhat irrelevant. That said, when damages are argued and assessed through the legal system, like the 2007 Moonlight Fire in northern California, the end result tends to be the replacement value of the lost land/timber.

The transportation disruptions due to the wildfires did bring significant costs, although they were temporary. Westbound lanes of I-84 were closed for 8 days in the Gorge, and eastbound lanes for 19 days. Economists at the Oregon Department of Transportation estimated the daily costs to trucking firms due to higher operating costs and payroll to be $250,000 to $290,000 per day. Passenger traffic was diverted to Washington SR14. Rail traffic disruptions were similarly modest. Union Pacific noted that tracks were shut down for four days, with customers experienced up to 48 hour delays on shipments.

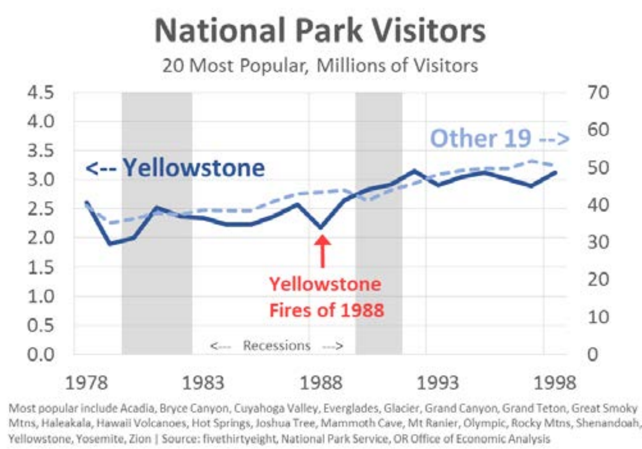
Assessing the net impact on Oregon businesses is difficult. While areas in the Gorge were shut down, other areas benefited from the diverted traffic. In particular, retailers on WA14, OR 35 and OR216 reported increased traffic and consumer demand. However the fact that some areas temporarily benefited comes as little consolation to many businesses that may have suffered permanent damage. Small businesses that were negatively hit by closures, particularly during their peak season when winter reserves are accumulated, will bear watching and could require public help over the next couple of years. In particular, access to capital is difficult for many small businesses. Cash flow issues for some may start to show up over the winter, and for others down the road when they face a major expense. In terms of specific industries, hospitality firms and retailers are the most likely to see the impacts. Agriculture firms and manufacturers were less likely to be impacted, however they did see increased shipping costs or delays. Additionally, many service firms that depend upon local customers were also likely spared long-term losses, even as they experienced a quiet few weeks.

As the Oregon Employment Department has been tracking, the impact of the fires on direct employment is minimal based on the initial, preliminary data available today. As more complete data becomes available, impacts are more likely to be seen in hours worked per employee, and wages, rather than whether an individual has a job or not.

For Oregon overall and the impacted regional economies within the state, the concern is slower growth moving forward as tourists, investments, and new firms or residents avoid the impacted areas. As such, looking for historical precedents may help to understand what Oregon has in store moving forward.

First, the Yellowstone fires of 1988 are a notorious example of a major fire event in a federally-owned tourist area. Surprisingly, looking at visitation to Yellowstone and the other major and popular national parks, there does not seem to be a noticeable impact outside of the year of the fires. Tourism and visitors returned the following year, and the year after, and the year after.

Yellowstone is huge. There are lots of trees, meadows, wildlife and the like. Just like the Gorge is big. There are myriad trails, waterfalls, and outdoor opportunities for people to enjoy right now and certainly next year.



Concerns in Ashland and possibly Brookings are more problematic. If cancellations of Shakespeare plays becomes a reoccurring pattern year over year that could hurt attendance over an extended period of time. For Brookings and surrounding areas that were impacted by the Chetco Bar fire, there could be larger local impacts to the extent it represents a smaller geographic area with a smaller population and tourism base.

Second, tourism around Mt. Saint Helens exhibited a similarly quick rebound following the eruption in 1980. Hotel occupancy one month after the eruption was down 15% in Portland relative to the previous year. Declines in areas with more ash problems like Spokane (-26%) and Yakima (-64%) were even more pronounced. However much of this decline could also be traced to high gas prices and the onset of a nationwide recession. That said, the eruption soon turned into a tourism asset. By August of 1980, just months after the eruption, U.S. Forest Service observation booths were welcoming 4,000 visitors per day.

Finally, there was a great deal of concern that heightened risks following the Mt. Saint Helens eruption would curb long-term regional economic activity. This is exactly the concerns today as well. The analysis performed at that time[2] is somewhat comforting, even amusing, given the benefit of hindsight. As the report says, a lot of the Portland area economic growth was in newer, "footloose" industries like electrical equipment, instrument, machinery, and transportation equipment manufacturing. These sectors located in the Portland area for "reasons other than accessibility to the local market or local natural resources. Instead most [located] for … high quality of life, including a clean environment and easy access to abundant recreational facilities." The Pacific Northwest continued to see stronger economic and population growth than the U.S. overall in the subsequent decades following Mt. Saint Helens. Expectations today remain this pattern will continue moving forward. However it is a risk to the outlook.

**** A Special Note on Retirements ****

The aging Baby Boomers are placing downward pressure on economic growth in recent years, and over the coming decade, possibly two. As they continue to enter retirement, net growth rates are and will be slower than we have become accustomed to. Take employment for example. For every retirement, a business must hire two workers to see net job growth. The first worker simply replaces the retiree, resulting in no job growth. A year ago, our office explored these issues a bit more in depth[3]. The upshot is there should be enough jobs in the future, but the topline, net job growth numbers mask the generational churn below the surface.

It should also be pointed out that these recent retirees are not just any old workers. They represent workers with a lifetime of experience and institutional knowledge for their industries and firms. Such workers cannot instantaneously be replaced. It creates challenges for businesses to adjust and adapt. However it also creates new opportunities for current and future workers to gain experience and grow into these roles.

While these trends are undoubtedly true across the economy, they hit especially close to home here in the small world of Oregon economics. This fall, we say farewell and happy retirement to both Paul Warner and Tom Potiowsky. Paul may be better known for his role as the Legislative Revenue Officer these past 18 years or so, however prior to that Paul was the State Economist throughout the 1990s. Tom was a professor of economics at Portland State University in the 1980s and 1990s before succeeding Paul as the State Economist for the 2000s. In recent years Tom returned to Portland State where he chaired the Economics Department and launched the Northwest Economic Research Center (NERC). Tom has officially retired from the faculty but will continue working at NERC. Paul's retirement is set for next week. However both promise to be around to offer us guidance and counseling.

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[2] "Economic Effects of the Eruption of Mt. Saint Helens," USITC, June 1980
[3] https://oregoneconomicanalysis.com/2016/12/07/will-there-be-enough-jobs/
https://oregoneconomicanalysis.com/2016/12/09/retiring-oregonians/

With the simultaneous retirements of Oregon's two longest serving State Economists, now is as good of time as ever to examine their careers and forecasting records. Our office after all is tasked with forecasting state tax collections. To this end our office has created a few State Economist statistics.

Given Oregon's unique kicker laws, there is a very tiny window for which our office's forecasts can hit the sweet spot. That happens when actual tax collections come in right at our forecast or slightly above it and yet below the kicker's two percent threshold. Over the decades this has occurred just twice, one indication of how hard it is to hit the sweet spot. Paul did hit the sweet spot once, for his very first Close of Session personal income tax forecast ahead of the 1991-93 biennium. It was not for another 20 years that our office produced as accurate of a forecast.

Now, when it comes to forecasting, one major factor in accuracy is the pesky business cycle and the turning points of when the economy heads into or out of recession. Paul, luckily, never experienced a recession under his State Economist watch. Besides being a great economist, this lack of a recession greatly aided his median forecast error over time. Paul's forecast errors are the lowest of any State Economist in Oregon's history. That said, Paul's Earned Kicker Average, or EKA, was high at .700. What this means is that Paul underestimated revenues by more than 2% (the kicker threshold) on 7 of his 10 Close of Session forecasts (5 each for the personal kicker, and the corporate kicker).

State Economist Statistics

	Sweet Spot /	EKA /	Median Error /	Recessions
Chang Sohn	0 /	.500 /	9.1% /	1
Ann Hanus	0 /	.833 /	6.0% /	1
Paul Warner	1 /	.700 /	2.1% /	0
Tom Potiowsky	0 /	.375 /	10.1% /	1
Dae Baek	0 /	.000 /	9.8% /	1
Mark McMullen	1 /	.667 /	3.2% /	0
OEA History	**2 /**	**.583 /**	**5.1% /**	**4**

Sweet Spot: Biennial General Fund Forecast lands 0-2% above COS
EKA: Earned Kicker Average (share of COS resulting in kicker, PIT and CORP)
Median Error: Median absolute biennial General Fund forecast error

Source: Oregon Office of Economic Analysis

Tom on the other hand dealt with a significantly more challenging economy over his tenure and it shows in his State Economist statistics, which take nothing away from the economist and mentor he has proved himself to be. Tom's first Close of Session forecast was ahead of the 2001-03 biennium, which turned out to be a forecaster's worst nightmare. Economic growth had slowed, but it was not entirely apparent the economy was in a full blown recession at the time of the May 2001 forecast. The recession is now judged to have begun in March 2001. The result of predicting positive, but slower economic and revenue growth when in fact revenues plunged, was a large forecast error. Not to be outdone, the economy soon turned up and on the back of the housing bubble, the 2005-07 biennium yielded the largest personal income tax kicker in Oregon's history. What Tom's State Economist statistics show is that forecasting during a volatile economic period results in larger forecast errors. Additionally Tom has a very low EKA – just 3 kickers in 8 opportunities – but when his forecasts did kick, boy did they ever.

Every current member of our office and of the Legislative Revenue Office owe a great deal of the opportunities we have had to Paul and/or Tom. We are forever grateful for their willingness to share their time, insights and expertise. Our office and the entire State of Oregon's analytical functions are better off for their years of service. Their daily presence in the office will be missed personally and professionally. May Paul and Tom enjoy their retirements and come back now and again to help us ~~sort out the mess they made~~ continue in their footsteps.

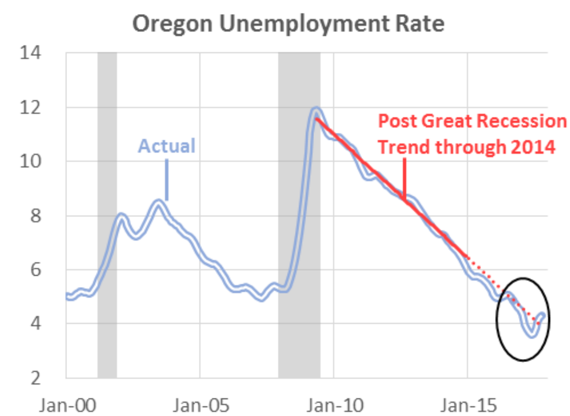
<u>Oregon Bottom Line</u>: All told, the current outlook for Oregon remains positive. The economy is expected to continue to improve. Even as Oregon is transitioning down to a more sustainable rate of growth, something closer to gains in the working-age population, job growth may still surprise to the upside. Between now and the next recession, all of the good dynamics that are finally happening, like rising household incomes and falling poverty rates, should continue.

Oregon's Labor Market

The Office of Economic Analysis examines four main sources for jobs data: the monthly payroll employment survey, the monthly household survey, monthly withholding tax receipts and the quarterly census of employment and wages. Right now all four measures of the labor market are improving. Jobs are being added, albeit at a slower rate. Wages are rising, both in aggregate and for each worker, however wages slowed to end 2016 and early in 2017. The unemployment is under what can be considered full employment for Oregon.

As our office has been discussing, or more accurately, warning over the past few years, the pattern of unemployment rate changes does not likely reflect the overall pattern of growth in the Oregon economy.

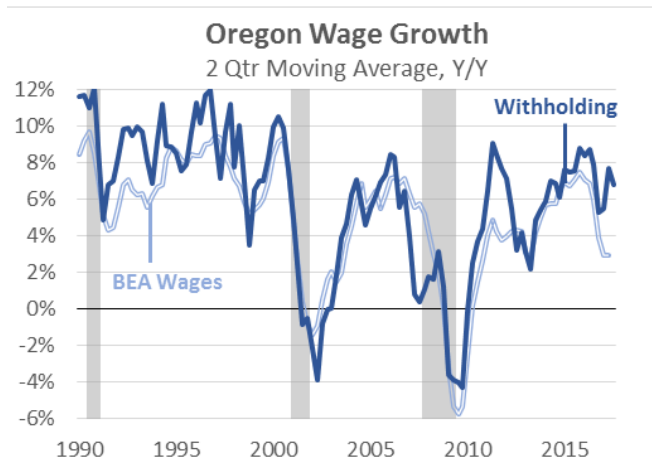
The preliminary data for both 2015 and 2016 showed the Oregon unemployment rate going on a roller coaster ride. A few months of extreme declines to start each year were followed by huge increases over the next few months. These types of increases in the unemployment rate have only been seen during recessions. These wild swings have largely been revised away each year during the annual benchmarking process (i.e. revisions). The overall pattern of Oregon's unemployment rate has been a fairly steady decline since the depths of the Great Recession.



Source: Oregon Employment Department, Oregon Office of Economic Analysis

However, it must be noted that once again Oregon's unemployment rate has plunged in early 2017 followed by increases in recent months. If the recent past is any guide, expect the month to month changes to be moderated once the data is revised in early 2018. Similarly, should the unemployment rate increase a handful of tenths of a percentage point over the rest of the year, it is unlikely a tell-tale sign of pending doom.

More importantly, wages in Oregon remain relatively strong. Withholding collections slowed to end 2016 and begin 2017. However growth has picked up and stabilizated in recent months, although somewhat slower than a few years ago. This pattern keeps with what the employment figures show as well.

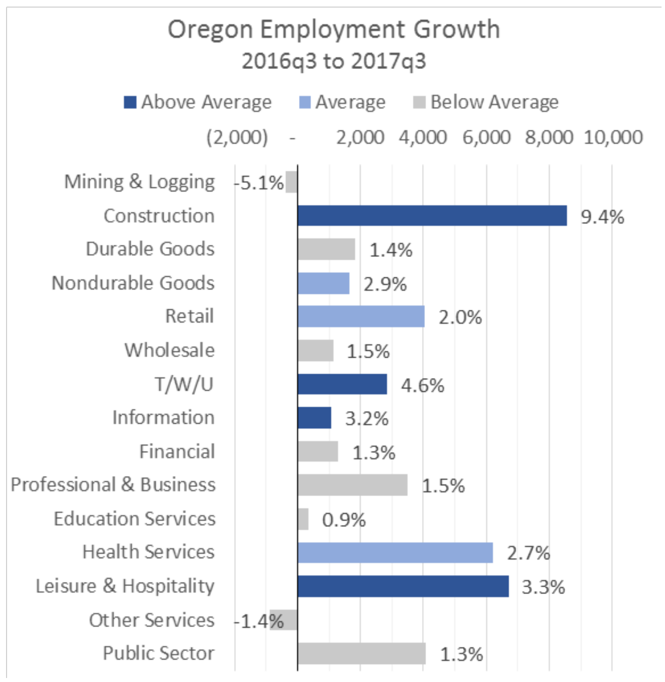


Differences in 2007 and 2011 due to withholding table changes by Oregon Dept of Rev.
Source: BEA, Oregon Dept of Revenue, Oregon Office of Economic Analysis

While national wage trends have just begun to accelerate in the past 12-18 months, Oregon's have been stronger for a few years now. Even Oregon's average hourly earnings have accelerated in the past year. Previously this measure, which only began in 2007 and thus is still new to the data world, had been growing near 0 percent in inflation-adjusted terms. Given all other Oregon-specific wage data was strong, average hourly earnings was an outlier. This is no longer the case. That said, one measure of Oregon wages that lags today are the wage and salary estimates from the U.S. Bureau of Economic Analysis (BEA). Revisions in recent quarters have been downward. However other data sources like actual withholdings out of Oregonian paychecks, and wages as measured in the unemployment insurance records indicate a growth rebound in 2017. Expectations are for the BEA wages to be revised higher in the coming quarters as these more timely measures of wages are incorporated into the BEA estimates.

Overall, getting a handle of the health of Oregon's labor market is being somewhat complicated by technical issues within the underlying payroll jobs data. For this reason the employment data in our office's forecast is adjusted for two important technical purposes: seasonality at the detailed industry level and the upcoming benchmark revisions[4]. Specifically, our office uses the benchmarked, or revised employment data through 2017q2 and imputes the 2017q3 employment data based upon the available preliminary Oregon estimates, national data, and our office's economic forecast model. As such, for this quarterly forecast, the first pure forecast period is 2017q4.

In the third quarter, total nonfarm employment increased 2.3 percent over the past year with the private sector growing at 2.5 percent and the public sector at 1.3 percent. These rates of growth are a clear step down from the full-throttle rates seen in recent years, however still remain faster than needed to keep pace with population gains so far.



The nearby graph illustrates the number of job gains by major industry by the length of the bar. The percentage increase these changes represent is noted as well. The bars are color coded by growth rate relative to total employment growth. Industries with dark blue colored bars are growing at rates much faster than total employment, light blue bars represent industries which are growing approximately in line with the average, while grey bar industries are growing at rates significantly less than the average.

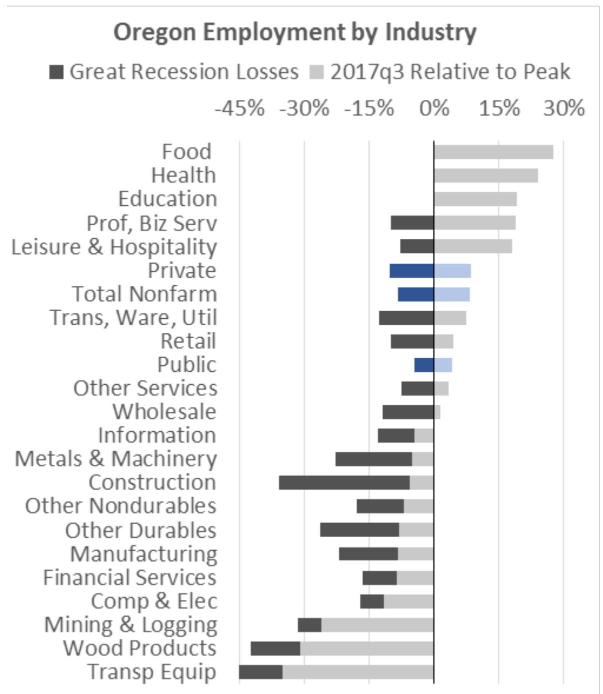
So far in recovery, the large service sector industries have generally led job growth in terms of the number of jobs added and with above-average growth rates. These include jobs in professional and business services, health services, and leisure and hospitality industries. These three industries have gained 16,400 jobs in the past year and account for 39 percent of all job gains across the state. The good news is that this share

[4] Each year the U.S. Bureau of Labor Statistics revise the employment data – a process known as benchmarking. The current establishment survey (CES), also known as the monthly payroll survey, is benchmarked against the quarterly census of employment and wages (QCEW), a series that contains all employees covered by unemployment insurance. The monthly CES is based on a sample of firms, whereas the QCEW contains approximately 96 percent of all employees, or nearly a complete count of employment in Oregon. The greatest benefit of the CES is the timeliness – monthly employment estimates are available with only a one month lag – and these estimates are reasonably accurate. However the further removed from the latest benchmark, the larger the errors. The QCEW is less timely as the data is released approximately 3-4 months following the end of the quarter. The greatest benefit of the QCEW is that is a near 100 percent count of statewide employment. For these reasons, the CES is usually used to discuss recent monthly employment trends, however once a year the data is revised to match the historical QCEW employment trends. The last month of official benchmark data is September 2016. The QCEW is currently available through June 2017, thus the preliminary benchmark used here covers the October 2016 – June 2017 period.

has generally been shrinking in recent years as other industries continue to add jobs as well, which was not the case earlier in the expansion.

In terms of illustrating how each industry has fared over the Great Recession and so far in recovery, the second graph shows both the depths of recessionary losses[5] and where each industry stands today relative to pre-recession peak levels.

Currently, ten major industries are at all-time highs. Private sector food manufacturing, education, and health never really suffered recessionary losses – although their growth did slow during the recession. Professional and business services and leisure and hospitality have each regained all of their losses and are leading growth today. In recent months retail emploment, other services, wholesale, and transportation, warehousing and utilities, in addition to the public sector have surpassed their pre-recession levels and are at all-time highs. The nine private sector industries at all-time highs account for 62 percent of all statewide jobs. The public sector accounts for an additional 17 percent of all jobs.



With the Great Recession being characterized by a housing bubble, it is no surprise to see wood products, construction, mining and logging and financial services (losses are mostly real estate agents) among the hardest hit industries. These housing and related sectors are now recovery, although they still have much ground to make up. Transportation equipment manufacturing suffered the worst job cuts and is likely a structural decline due to the RV industry's collapse[6]. With that being said, the subsectors tied to aerospace are doing better and the ship and boat building subsector is growing again. Metals and machinery manufacturing, along with mining and logging, have shown the largest improvements since the depths of the recession.

Coming off such a deep recession, goods-producing industries exhibited stronger growth than in past cycles. While all manufacturing subsectors have seen some growth, they are unlikely to fully regain all of their lost jobs. The good news, certainly in the short-term, is that much of the manufacturing sector has returned to growth in recent months following declines a quarter or two ago. All told, Oregon manufacturers typically outperform those in other states, in large part due to the local industry make-up. Oregon does not rely upon old auto makers or textile mills. The state's manufacturing industry is comprised of newer technologies like aerospace and semiconductors. Similarly Oregon's food processing industry continues to boom.

All told, each of Oregon's major industries has experienced some growth in recovery, albeit uneven. As the economy continues to recover there will be net winners and net losers when it comes to jobs, income and sales. Business cycles have a way of restructuring the economy.

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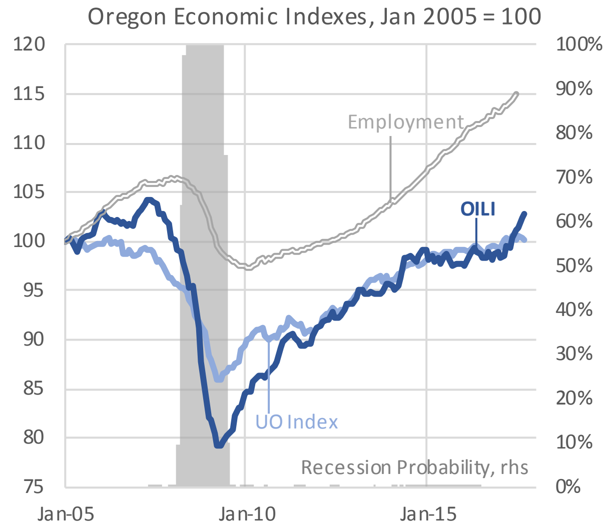
[5] Each industry's pre-recession peak was allowed to vary as, for example, construction and housing-related industries began losing jobs earlier than other industries or the recession's official start date per NBER.

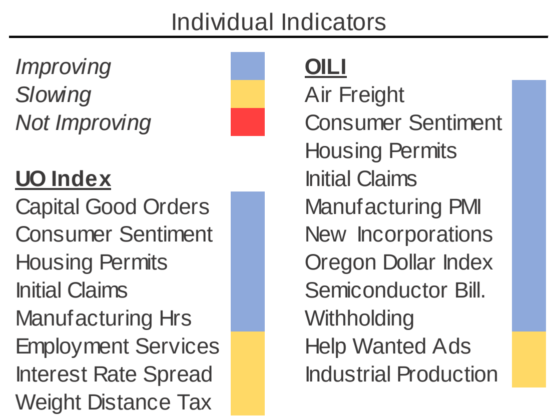
[6] http://oregoneconomicanalysis.com/2012/07/10/rv-workers-and-reemployment/

For additional information on the most recent quarter's employment forecast errors, please refer to Table A.1 in Appendix A.

Leading Indicators

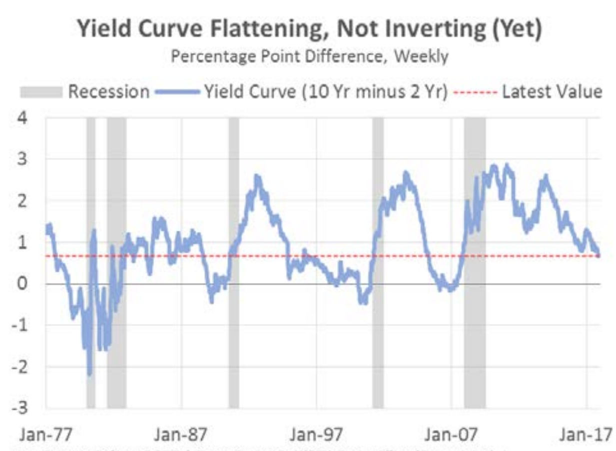
After more than two years of no real sustained movement up or down, both of the Oregon-specific composite leading indicators may be breaking through the malaise to the upside. In keeping with the general pattern of economic growth, the mixed bag of indicators in both our office's Oregon Index of Leading Indicators (OILI) and the University of Oregon's Index of Economic Indicators, showed many of the manufacturing, or goods-producing indicators languishing while all others pointed toward growth. As discussed in recent quarters, the manufacturing indicators began picking up, leading to gains in the overall index. This pattern continued in recent months.





As of today no individual indicators are showing no growth. In recent quarters both Help Wanted Ads and the Oregon Dollar Index were flashing warning signs for those indicator series. However businesses are posting more job openings and the dollar is depreciating. Among the indicators that are currently slowing, none are particularly worrisome from an economic growth perspective. The fact that housing permits and new construction continues to increase slowly in fits and starts is worrisome from an affordability point of view, but it also suggests the housing expansion still has legs to run.

Across both aggregate leading indicators there are no real signs for concerns at the moment.



The one indicator that some national analysts and forecasters are pointing to is the yield curve, or the spread between long-term interest rates and short-term interest rates. The yield curve inverts – where long-term rates are actually lower than short-term rates – about 1-2 years prior to an economic recession. In recent years the yield curve has flattened, which means it is moving closer to inverting. While this may "look bad" it is actually typical behavior during an economic cycle and a Federal Reserve tightening cycle. It is the actual inversion of rates and what it says about future economic growth that matters. That said, the flattening yield curve may indicate that the U.S. is locked into this low growth scenario. It may also indicate that the Federal Reserve needs to move cautiously with future rate increases, lest the Fed invert the yield curve itself by continuing to hike into an economy that is not strong enough to withstand the increases.

Right now the U.S. economy is not in recession. University of Oregon professor Jeremy Piger has created a real time probability of recession[7] model, and finds there is just 2.5 percent chance the U.S. has entered into a recession. However, another recession will come, of that we can be sure. IHS Global Insight puts the probability of recession over the next year at 20 percent, and the Wall Street Journal consensus is at 15 percent.

Hopefully Oregon's leading indicators will give a signal in advance of the next recession, which neither is doing today. While past experience is no guarantee of future performance, Oregon's leading indicator series do have a good track record in their relatively brief history. Both series flattened out in 2006 and began their decline in advance of the Great Recession. Similarly both Oregon series reached their nadir in March 2009, a few months before the technical end of the recession (June 2009 per NBER) and about 9 months in advance of job growth returning to Oregon.

Short-term Outlook

While Oregon's economic expansion continues, growth has slowed and stabilized. In recent years, the state has enjoyed robust, full-throttle rates of job gains in the 3-3.5 percent range, or nearly 5,000 jobs per month. No longer is this the case. Oregon is expected to continue to see healthy job gains – a bit more than 3,000 per month or about 2 percent over the course of the 2017-19 biennium – but the state is now past its peak growth rates for this expansion. Importantly, such gains remain strong enough to hold unemployment down and account for ongoing population growth.

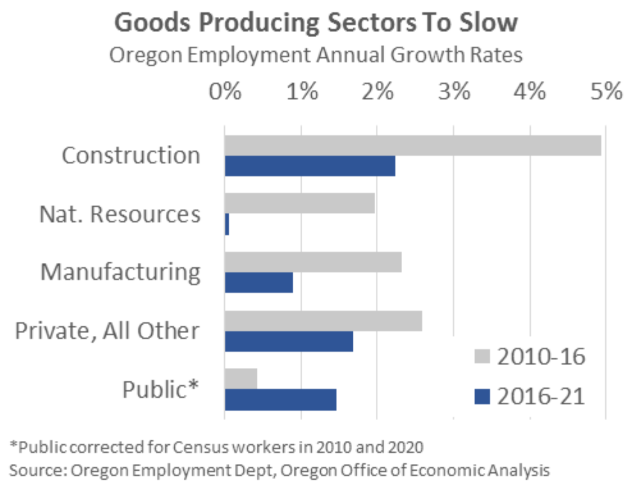
After these near-term job gains, longer-run demographic trends weigh on growth to a larger degree. While consistent with the general character of recent forecasts, there are a few minor revisions. Employment is revised upward by a few thousand jobs year in the future. However personal income is revised down somewhat. Total personal income is lowered by less than half a percent, primarily due to a slightly slower wage outlook. Much of these changes are due to the historical revisions made by the BEA as discussed previously. The expectation of future growth rates remains largely unchanged, however the base has been revised a little lower.

The state's new minimum wage law, passed during the 2016 legislative session, will also impact the Oregon economy over the forecast horizon. Using estimates provided by the Oregon Legislative Revenue Office, along with the academic literature, our office's outlook includes a slowdown in job growth due to the higher minimum wage moving forward. While the impact is small when compared to the size of the Oregon economy, it does result in approximately 40,000 fewer jobs in 2025 than would have been the case absent the legislation. Our office is not predicting outright job losses due to the higher minimum wage, however we are expecting future growth to be slower as a result. In the near term, the higher minimum wage boosts overall state income as low-wage workers receive raises. Over the medium term, employers are expected to adjust to the higher wages and increase worker productivity, possibly via capital for labor substitutions. Our office has incorporated these overall effects into the outlook for wages and in the industries which employ the largest numbers of low-wage workers. These include the obvious like leisure and hospitality, and retail trade, but also health care and food processing manufacturing, among others.

[7] http://pages.uoregon.edu/jpiger/us_recession_probs.htm/

Should this overall economic outlook come to pass, it will have matched the equivalent of previous expansions in Oregon. Given demographic trends today, particularly the aging Baby Boomer cohort, job growth of 3 percent is considered full throttle. In decades past, growth of 4 or 5 percent was common during expansions in Oregon, however that time period also coincided with the Baby Boomers entering their prime working years. Today the opposite is occurring. Even so, demographic trends are not all bad, as the even larger cohort of Millennials are currently entering their prime working years. The net effect is overall lower rates of labor force and economic growth, due to demographics.

Private sector growth, measured by the number of jobs created, will be dominated by the large, service sector industries like professional and business services, leisure and hospitality and health.



Nevertheless, goods-producing industries, while smaller, had previously been growing at above-average rates. Expectations in recent forecasts have been that these goods-producing industries would slow. Growth over the next few years would be considerably less than that seen in the past few years. Even construction is expected to add jobs at a slower pace even as the housing rebound continues. This is in part due to the fact that growth must cool off after the exceptionally strong gains in construction in recent years.

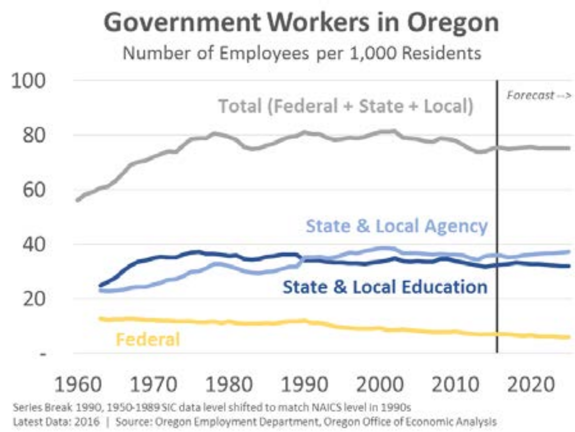
Manufacturing in particular was expected to see minimal gains in the coming years. The good news is that after sustaining losses during the middle of 2016, manufacturing employment in Oregon has started to add jobs again. As the manufacturing cycle continues to strengthen some, additional gains are expected. This growth is expected to be strongest among the state's food processors, and beverage manufacturers, predominantly breweries. That said, any global weakening or further strengthening of the dollar will weigh further on growth.

Economic Forecast Summary

		Quarterly					Annual				
		2017:3	2017:4	2018:1	2018:2	2018:3	2016	2017	2018	2019	2020
Personal Income, Nominal	U.S.	2.6	3.6	5.0	4.0	4.3	2.4	3.1	4.0	4.8	5.0
% change	Oregon	7.1	5.0	5.7	5.2	5.0	4.2	3.8	5.4	5.4	5.5
Wages and Salaries, Nominal	U.S.	3.8	4.4	5.2	4.7	4.8	2.9	3.4	4.7	4.9	4.8
% change	Oregon	11.4	6.0	6.6	6.1	6.0	5.4	4.5	6.8	5.8	5.3
Population	U.S.	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.8	0.8	0.8
% change	Oregon	1.8	1.4	1.3	1.5	1.7	1.5	1.6	1.5	1.4	1.3
Housing Starts	U.S.	1.16	1.21	1.25	1.28	1.33	1.18	1.19	1.30	1.40	1.44
U.S. millions, Oregon thousands	Oregon	21.3	20.1	21.7	22.4	23.0	19.1	19.2	22.4	23.0	23.9
Unemployment Rate	U.S.	4.3	4.3	4.3	4.3	4.3	4.9	4.4	4.3	4.3	4.3
	Oregon	4.0	4.2	4.3	4.4	4.5	4.9	4.0	4.4	4.5	4.7
Total Nonfarm Employment	U.S.	1.2	1.8	1.1	1.3	1.1	1.8	1.5	1.3	1.1	0.9
% change	Oregon	2.1	2.8	2.0	2.0	2.1	2.9	2.3	2.2	1.6	1.0
Private Sector Employment	U.S.	1.4	2.1	1.2	1.5	1.3	1.9	1.7	1.5	1.2	0.9
% change	Oregon	1.4	3.0	2.0	2.0	2.2	3.1	2.5	2.2	1.6	0.9

Public sector employment at the local, county and state level for both education and non-education workers is growing in Oregon, as state and local revenues continue to improve along with the economy. Over the forecast horizon, government employment is expected to grow roughly in line with population growth and the increased demand for public services, albeit just a hair faster than population growth alone. One risk to the outlook is the recent Oregon Supreme Court decision which reversed earlier Public Employees Retirement System (PERS) changes enacted by the Legislature. The extent to which the court decision will impact hiring by local and state public entities is unknown, but it is a risk to the outlook.

Along with an improving labor market, stronger personal income gains are here. 2013 personal income is estimated to have increased by just 1.7 percent. This largely reflects the pulling forward of investment-type income into 2012 in anticipation of increased federal tax rates in 2013. Since then, personal income has rebounded strongly with robust gains seen in both 2014 (6.9%) and 2015 (7.6%). Continued gains are expected moving forward, albeit at slower rates particularly in 2016 due to revisions and 2017 as well. Income growth is estimated to be just 3.8 percent in 2016 and forecasted to be 5.4 percent in 2017 and in 2018.



As the economy continues to improve, household formation is increasing too, which will help drive up demand for new houses. Household formation was suppressed earlier in the recovery, however the improving economy and increase in migration have returned in full force. Even as more young Oregonians are living at home, as the Millennials continue to age beyond their early 20s, demand for housing will increase as well.

Housing starts in the third quarter totaled 21,300 at an annual pace. This marks the highest rate of new construction since the second quarter of 2007. Some of this increase is likely a seasonal issue, as the second quarter of 2017 was exceptionally weak compared to the prior few quarters. Overall a level of about 21,000 housing starts is the long-run average for the state prior to the housing bubble. The forecast calls for relatively strong growth in the coming few years with starts reaching just over 19,200 in 2017 and 22,400 in 2018. Over the extended horizon, starts are expected to average around 24,000 per year to meet demand for a larger population and also, partially, to catch-up for the underbuilding that has occurred in recent years. As of today, new home construction is cumulatively about one year behind the stable growth levels of prior decades even after accounting for the overbuilding during the boom.

A more complete summary of the Oregon economic outlook and forecast changes relative to the previous outlook are available as Table A.2 and A.3 in Appendix A.

Forecast Risks

The economic and revenue outlook is never certain. Our office will continue to monitor and recognize the potential impacts of risk factors on the Oregon economy. Although far from comprehensive, we have identified several major risks now facing the Oregon economy in the list below:

- U.S. Economy. While Oregon is more volatile than the nation overall, the state has never missed a U.S. recession or a U.S. expansion. In fact, Oregon's business cycle is perfectly aligned with the nation's, at least when measuring peak and trough dates for total nonfarm employment. If anything, Oregon actually leads the U.S. by a month or two. The fact that there are a few worrisome trends at the U.S. level and the slowdown has hit Oregon means there should be some concerns about the outlook. Should the U.S. fall into recession, Oregon will too. That said, should the U.S. economy accelerate following the lifting of headwinds, Oregon's economy should receive a similar boost as well.

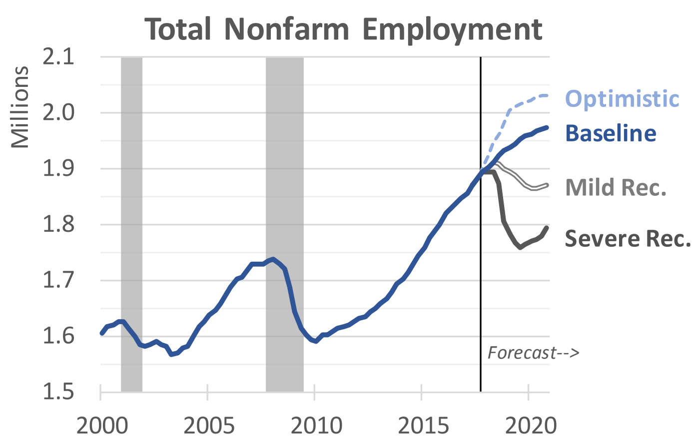
- Housing affordability. Even as the housing market recovers, new supply entering the market has not kept up with demand (both from new households and investor activity). This applies to both the rental and ownership sides of the market. As such, prices have risen considerably and housing (in)affordability is becoming a larger risk to the outlook. Expectations are that new construction will pick up in the next year or three, to match the increase in demand, which will alleviate price pressures. However to the extent that supply does not match demand, home prices and rents increasing significantly faster than income or wages for the typical household is a major concern. While not included in the baseline outlook, significantly worse housing affordability may dampen future growth given Oregon's reliance on net in-migration.
- Global Spillovers Both Up and Down. The international list of risks seems to change by the day: sovereign debt problems in Europe, equity and property bubbles in places like Canada, South America and Asia, political unrest in the Middle East and Ukraine, and commodity price spikes and inflationary pressures in emerging markets. In particular, with China now a top destination for Oregon exports, the state of the Chinese economy – and its real estate market, or public debt burden – has spillover effects to the Oregon economy. Any economic slowing in Asia is a potential threat to the Pacific Northwest.
- Federal fiscal policy. The uncertainty regarding federal fiscal policy remains a risk. Some policies are likely to impact Oregon than the typical state, while others maybe not as much. The good news for Oregon is that outside of outright land ownership, the federal government has a relatively small physical presence in the state. This means that direct spending reductions are less likely to hurt Oregon. Of course, it also limits the local benefit from any potential increases in federal spending. In terms of federal grants as a share of state revenue, Oregon ranks 29th highest. For federal procurement as a share of the economy, Oregon ranks 48th highest. Oregon ranks below average in terms of military-dependent industries as well. The one area that Oregon ranks above average is in terms of direct federal employment, ranking 19th highest among all states. Oregon also is exposed to an above-average share of federal transfer payments to households. Transportation funding is also a major local concern. Overall, the direct impact may be less than in other states but the impact will be felt nevertheless, particularly as our closest neighboring states have large federal and military workforces.
- Climate. Weather forecasting is even more difficult than economic forecasting a year or two into the future. While the severity, duration and timing of catastrophic events like earthquakes, wildfires and droughts are difficult to predict, we do know they impact regional economies. Fires damage forests and tourism. Droughts in particular impact our agricultural sector and rural economies to a larger degree. Longer-term issues like the potential impact of climate change on domestic migration patterns are likewise hard to predict and outside our office's forecast horizon. There is a reasonable expectation that migration flows will continue to be strong as the rest of the country becomes less habitable over time.

- Commodity price inflation. Always worrisome is the possibility of higher oil (and gasoline) prices. While consumer spending has held up pretty consistently in this recovery, anytime there is a surge in gas prices, it eats away at consumers' disposable income, leaving less income to spend on all other, non-energy related goods and services.
- Federal timber policy. Even with a temporary reinstatement of payments, it has been and it is clear that federal policymakers will not reinstate the program the same as before, however negotiations are ongoing for more sustainable timber harvests and related revenue. In the meantime, reductions in public employment and services are being felt in the impacted counties. For more information from a historical perspective, see two recent blog posts, here and here[8].
- Initiatives, referendums, and referrals. Generally, the ballot box and legislative changes bring a number of unknowns that could have sweeping impacts on the Oregon economy and revenue picture.

Alternative Scenarios

The baseline forecast is our outlook of the most likely path for the Oregon economy. As with any forecast, however, many other scenarios are possible. In conjunction with the Legislative Revenue Office, this forecast provides three alternative scenarios, which are modeled on growth patterns over previous business cycles.

Alternative Scenarios **Dec 2017**



	2017	2018	2019	2020
Employment				
Baseline	2.3%	2.2%	1.6%	1.0%
Optimistic	2.5%	4.0%	3.0%	0.8%
Mild Recession	2.3%	1.6%	-1.3%	-0.8%
Severe Recession	2.3%	-0.5%	-5.3%	0.6%
Personal Income				
Baseline	3.8%	5.4%	5.4%	5.5%
Optimistic	4.4%	8.8%	6.8%	5.3%
Mild Recession	3.8%	4.8%	2.5%	4.4%
Severe Recession	3.8%	2.9%	-2.5%	5.8%

Optimistic Scenario:

The recovery gathers steam and pulls the economy into a stronger cyclical expansion. The relatively lackluster economic growth seen in the earlier stages of recovery, the manufacturing weakness in 2015 and 2016 and the recent slowing in U.S. personal income all recede into the rearview mirror of history and the U.S. economy builds momentum through the end of 2017 and into 2018. The economy is soon firing on all cylinders. Economic growth is above potential in 2018, resulting in stronger job and income gains. This stronger growth leads to more consumer spending and more business investment.

[8] http://oregoneconomicanalysis.wordpress.com/2012/01/23/historical-look-at-oregons-wood-product-industry
http://oregoneconomicanalysis.wordpress.com/2013/05/28/timber-counties/

In Oregon, job gains are broad based with strong growth in all private sector industries. The unemployment rate remains lower than under the baseline scenario as individuals are able to find employment more readily and income growth accelerates. The labor force participation gap closes. The increase in employment and income support a self-sustaining economic expansion in which new income fuels increased consumer spending (and debt reduction) which begets further increases in employment. Such an expansion increases housing demand as newly employed households (and increasing income for existing households) find their own homes after doubling-up with family and friends during the recession. This results in new construction returns to normal levels about a year earlier than the baseline.

<u>Mild Recession Scenario</u>:

The slowdown seen in the past year is even more pronounced. Oregon employment and GDP grow slowly to end 2017 and into 2018. The housing market stalls (again), removing one driver of growth. Strained trade relations result in falling exports, business confidence tumbles and so does capital spending. The U.S. dollar strengthens, chocking off the manufacturing cycle. These factors are enough weight on the recovery that by mid-2018 the economy slides back into recession. Job losses ensue and while not severe – about 45,000 jobs in Oregon when it is all said and done – it takes a toll on business income, housing starts and personal income. The unemployment rate returns to nearly 7 percent. The net effect of the mild recession is an extended period of prolonged economic weakness, not unlike Japan's so-called Lost Decade(s). Although inflation is expected to remain positive, a key difference.

<u>Severe Recession Scenario</u>:

After expanding for 8+ years at lackluster growth rates, the U.S. economy falls back into recession. Industrial production declines and the slower personal income growth in the U.S. worsens. Strained trade relations develop into an all-out trade war. The Fed, already lacking in traditional monetary policy ammunition, is not able to stave off the impact. While the catalyst may be different, the economic effect is similar to late 2008 and early 2009, although not quite as severe when the dust settles. This is little comfort when the unemployment spikes back to near 10 percent and nearly 135,000 Oregonians lose their jobs by mid-2019. Besides the domestic economic headwinds and Federal Reserve tightening, the likely culprit in this scenario is a meltdown of the financial markets sparked by some geopolitical shock. Economic growth in the U.S., while fairly steady as of late, is not nearly strong enough to withstand an external financial shock of this magnitude. Further economic effects of a recession this size are personal income losses of around 4 percent, about three-quarters the size of the Great Recession losses in Oregon. Housing starts plummet to near historical low levels of construction and home prices decline further. On the bright side, when construction does rebound, it will result in a surge of new home building that will rise above the state's long term average level of building due to pent-up demand for housing and that the state will have under built housing during this time period.

Extended Outlook

IHS Economics projects Oregon's economy to fare well relative to the rest of the country in the coming years. The state's Real Gross State Product is projected to be the fifth fastest among all states across the country in terms of growth with gains averaging 2.8 percent through 2022. Total employment is expected to be the eighth strongest among all states at an annualized 1.4 percent, while manufacturing employment will be the second fastest in the country at 2.0 percent. Total personal income growth is expected to be 4.6 percent per year, the twelfth fastest among all states, according to IHS Economics.

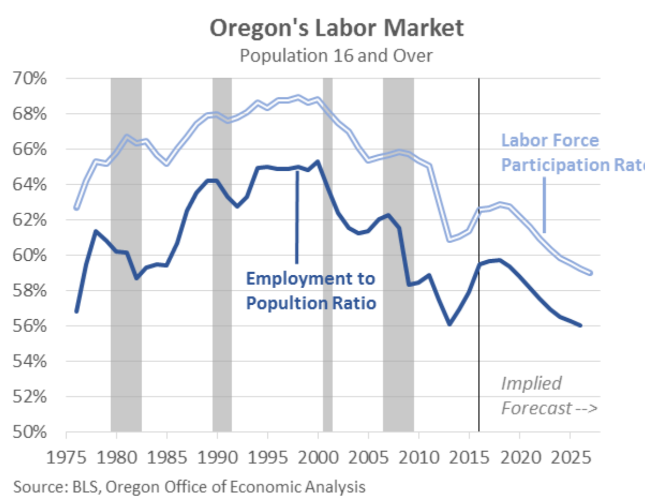
Our office is equally bullish in terms of Oregon's relative growth prospects. Much of Oregon's advantage comes from population growth, specifically the ability to attract and retain young, working-age households. In recent years, IHS had been forecasting Oregon population growth of around 1 percent annually. Our office expects it to average 1.3 per year over the next handful of years. In recent months, IHS has raised their Oregon population forecast to 1.24 percent annually, which is very close to our office's expectations. As such, our overall economic outlooks are now similar.

OEA has identified three main avenues of economic growth that are important to continue to monitor over the extended horizon: the state's dynamic labor supply, the state's industrial structure and the current number of start-ups, or new businesses.

Oregon has typically benefited from an influx of households from other states, including an ample supply of skilled workers. Households continue to move to Oregon even when local jobs are scarce, as long as the economy is equally bad elsewhere, particularly in California. Relative housing prices also contribute to migration flows in and out of the state. For Oregon's recent history – data available from 1976 – the labor force in the state has both grown faster than the nation overall and the labor force participation rate has been higher. However while the past two years have brought considerable improvements there remain potentially worrisome signs, particularly when the next recession comes.

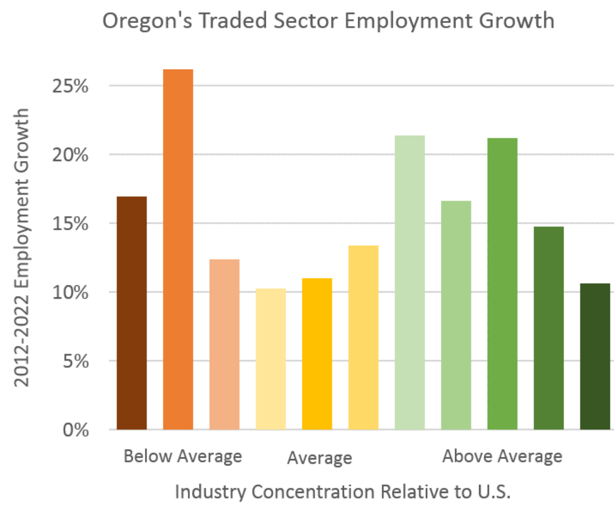
First, on the bright side, all of the recessionary-induced declines in the labor force itself have been reversed in the recent years. Oregon's labor force has never been larger. However, the participation rate remains somewhat lower than expected, when adjusting for the size of the population and the aging demographics. Oregon's participation rate is rebounding today, which is great news, however the participation gap is still cause for concern. While much of the past decade's patterns can be attributed to the severe nature of the Great Recession, and even the lackluster housing boom itself, some of the damage is likely to be permanent. The longer the expansion continues, the more likely the permanent damage will be small.

All told, our office's baseline outlook calls for some continued improvement in the near-term for both the labor force participation rate and the employment to population ratio. These gains are due to the shorter run cyclical rebound in the economy, before longer-run demographic trends will weigh on these measures. Focusing just on the prime working age cohorts reveals stronger improvements and a better outlook.



Oregon's industrial structure is very similar to the U.S. overall, even moreso than nearly all other states. That said, Oregon's manufacturing industry is larger and weighted toward semiconductors and wood products, relative to the nation which is much more concentrated in transportation equipment (autos and aerospace). However, these industries which have been Oregon's strength in both the recent past and historically, are now expected to grow the slowest moving forward. Productivity and output from the state's technology producers is expected to continue growing quickly, however employment is not likely to follow suit. Similarly, the timber industry remains under pressure from both market based conditions and federal regulations. Barring major changes to either, the slow growth to downward trajectory of the industry in Oregon is likely to continue.

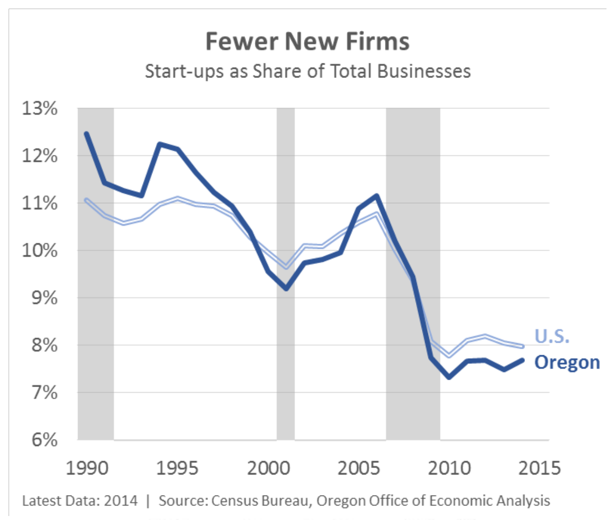
With that being said, certainly not all hope is lost. Many industries in which Oregon has a larger concentration that then typical state are expected to perform well over the coming decade. These industries include management of companies, food and beverage manufacturing, published software along with gains in crop production and nurseries.



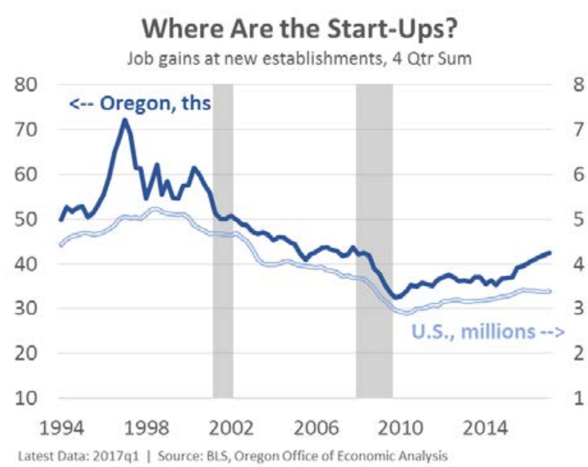
Industry concentration = 2012 employment location quotient at 4 digit NAICS level
Each column represents approximately 1/11 of Oregon traded sector employment
Source: BLS, Oregon Employment Department, Oregon Office of Economic Analysis calculations

The state's real challenges and opportunities will come in industries in which Oregon does not have a relatively large concentration (the orange bars in the graph). These industries, like consulting, computer system design, financial investment, and scientific R&D, are expected to grow quickly in the decade ahead. To the extent that Oregon is behind the curve, then the state may not fully realize these gains if they rely more on clusters and concentrations of similar firms that may already exist elsewhere in the country.

Another area of potential concern that may impact longer term economic growth is that of new business formation. Over the past year or two, the number of new business license applications with the Oregon Secretary of State have begun to grow again and even accelerate. However data available from the U.S. Census Bureau and Bureau of Labor Statistics clearly indicate that entrepreneurship and business formation remain at subdued levels and rates.



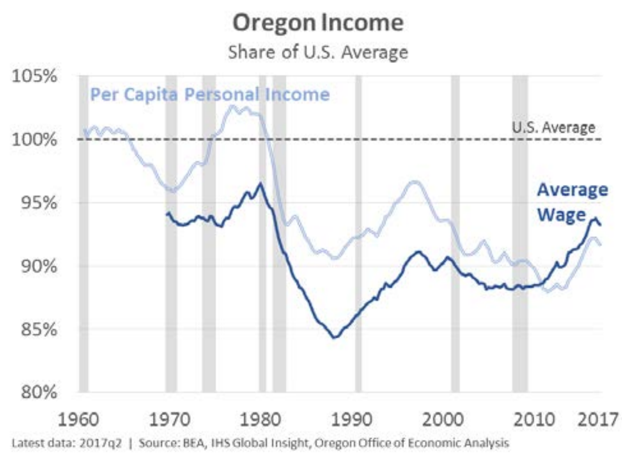
The share of all businesses that are start-ups, either in Oregon or across the nation, is effectively at an all-time low, with data starting in the late 1970s. Associated start-up employment follows a similar pattern. The concern is that new businesses are generally considered the source of innovation and new ideas, products and services that help propel economic growth. To the extent that fewer start-ups indicate that R&D more broadly is not being undertaken, slower growth is to be expected moving forward. However, if the larger firms that have won out in today's marketplace are investing in R&D and making those innovations themselves, then the worries about the number of start-ups today is overstated. It can be hard to say which is the correct view. However seeing these longer run, downward trends in



new business formation warrants, at the very least, concern about future growth prospects.

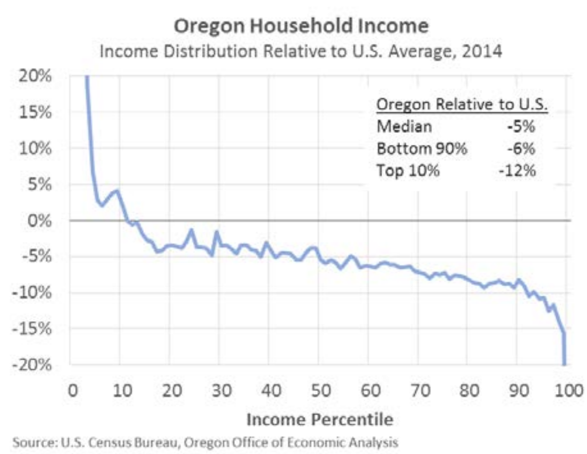
Finally, Oregon also enjoys the long-term advantages of low electricity costs; a central location between the large markets of California, Vancouver and Asia; clean water; low business rents and living costs when compared to other Left Coast locations; and an increasingly diverse industrial base.

One long-run concern for policymakers, think tanks and Oregon's economy is that very little progress on raising per capita income is projected out to 2027. In and of itself, a higher per capita income level would better fund public services for citizens. The benefit side of the state's relatively low income figures is that local firms do not have to pay higher wages, thus helping support the firms' balance sheets as well. It is not purely a lose-lose proposition. The Oregon Employment Department has published[9] a detailed look at Oregon's per capita personal income.



While the state's per capita income remains low, the state's average wage does not. Today, Oregon's average wage relative to the nation, is at its highest point since the mills closed in the 1980s. While some industries are seeing stronger growth, these gains are broad-based across regions and industries in Oregon.

In terms of the outlook, expectations are that wages will remain at this high watermark but not increase much further, at least relative to the nation. The primary reason for this is that Oregon's average wages have already accelerated in recent years, even as U.S. wages are just now picking up. Our office expects Oregon's average wage to continue to increase 3-4 percent per year. However as the U.S. accelerates closer to Oregon's annual rate, Oregon's growth advantage in recent years will lessen.



As for the per capita personal income outlook, expectations are that some progress will continue to be made. One major factor influencing the per capita income trends is the relative incomes at the very top of the distribution. Make no mistake, Oregon's highest-income households have done well financially. However incomes at the top of the national distribution have increased even further. Additionally, Oregon's highest-income households have considerably less income than their national counterparts. The further up in the distribution you go, the less income Oregonians have relative to the entire country. The concentration among the richest households is large enough to weigh on Oregon's overall per capita income figures.

[9] http://olmis.emp.state.or.us/olmisj/PubReader?itemid=00007366

The good news is that median incomes in Oregon have not eroded over time relative to the nation. That means the typical household in Oregon is not continually becoming worse off relative to the typical American household. This difference of trends at various points along the income distribution indicates a more complicated economic story is unfolding. Yes, Oregon's per capita personal income has eroded over the past generation. However that erosion is not seen among the typical household or for the typical worker. Given the distribution issues and the economic outlook, Oregon's per capita personal income is not expected to catch the national average.

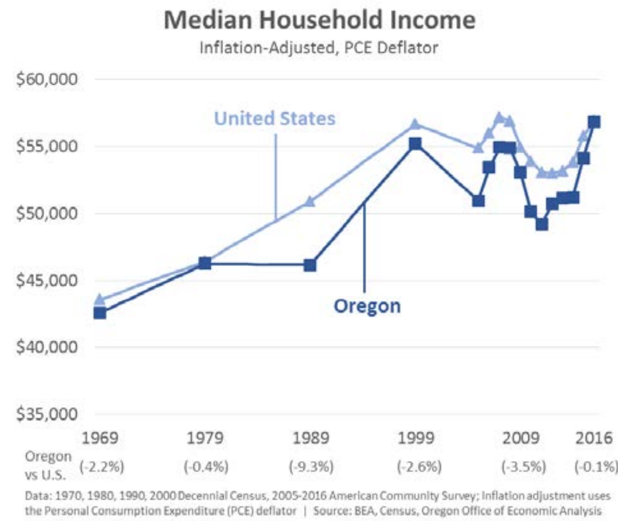
Regional Comparisons

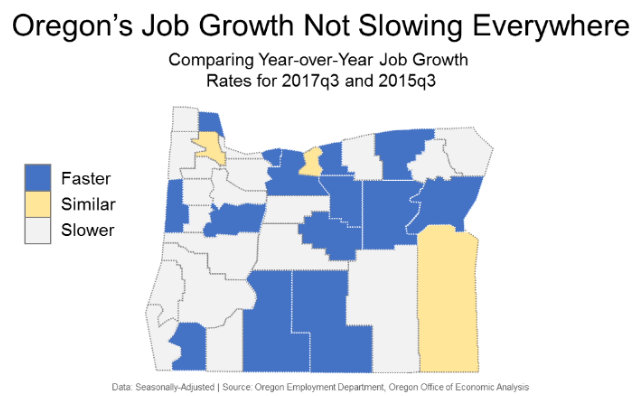
Oregon overall is transitioning down from peak growth rates seen in 2014 and 2015 to a more sustainable, long-term rate. However this deceleration is primarily seen in the state's large urban areas which are closer to full employment. Rural Oregon overall is seeing relatively steady job growth of around 2 percent annually since the spring of 2015. These gains in rural Oregon outpace what the nation has seen over this time period. Encouragingly, as seen in the nearby map, a number of the hardest hit counties and areas of the state are actually experiencing a pick-up in employment growth in recent years.

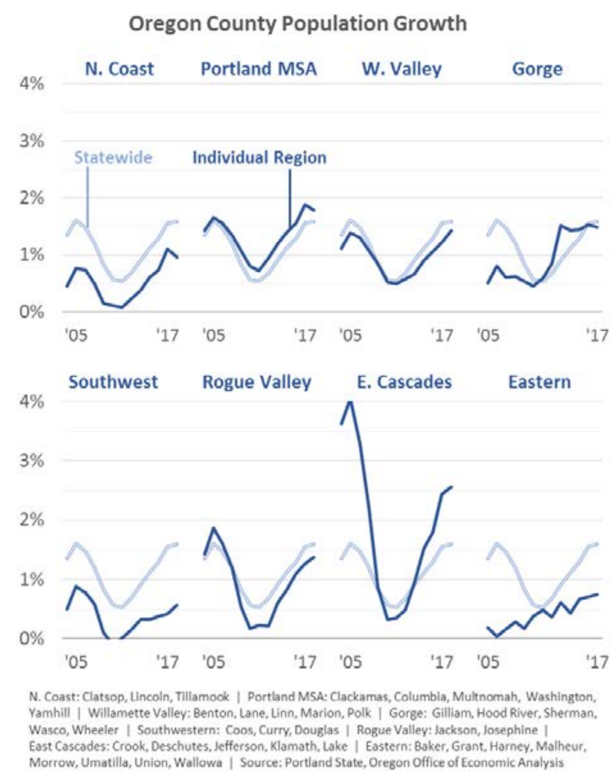
Now, every county is not fully recovered from the Great Recession. However 35 of 36 counties are adding jobs over the past year, while 21 of 36 counties have more jobs today than prior to the Great Recessions.

Similarly, every single region and every single county in Oregon added population in 2017. In fact for the past 4 years, every county in Oregon has added population except for Grant (John Day) which has seen 2 gains and 2 losses.

Given the importance of population growth, and migration in particular, for Oregon's economy, seeing these positive trends across the state is encouraging for the regional outlook as well.

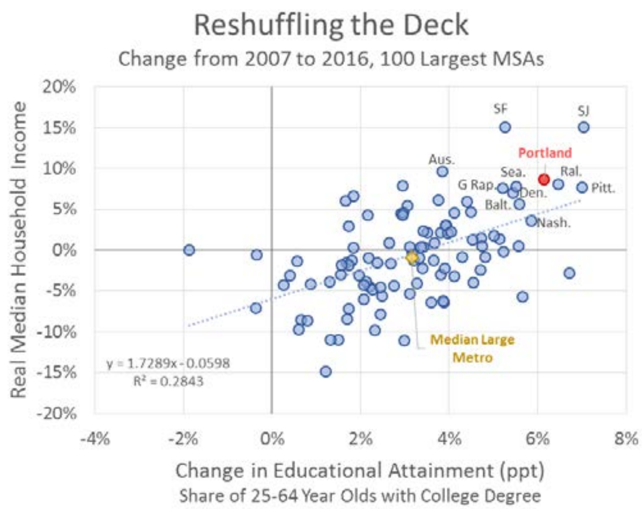






Metro Comparisons

Recessions have a way of reorienting or even restructuring an economy. Some industries fall back, others step forward. Such changes propel entire regional economies ahead of others depending upon the nature of the business cycle.



Source: BEA, Census, Oregon Office of Economic Analysis

Across the nation's 100 largest metro areas, Portland has experienced Top 5 gains for high-wage job growth, rising levels of educational attainment, and household income growth. See our office's *Portland in Transition*[10] report for more. However, Portland is not alone when it comes to seeing big gains.

Many of the other metro areas experiencing similar growth to Portland are no surprise. These include Austin, the Bay Area, Denver, and Seattle, among others. However there are a few surprises.

In terms of relative rankings, the only other metros besides Portland to see such sizable jumps were Grand Rapids, MI and Pittsburgh, PA. While similar in percentage changes to Portland, these other two metro areas were starting from a different base. Arguably the changes in Grand Rapids and Pittsburgh have been even more transformational than those seen locally. Portland went from the top third to the top fifth of metros for these measures. Grand Rapids went from 61st to 43rd for income, and 73rd to 51st for educational attainment. Pittsburgh, already a highly-educated region, went from 38th to 22nd for educational attainment, but from 81st to 58th for household income. These are massive gains and great news for their regional economies. However they are different in nature than those seen here in Oregon, and in Portland in particular.

[10] https://oregoneconomicanalysis.com/2017/09/28/report-portland-in-transition/