ANALYZING CHANGES IN MONTANA'S GENERAL FUND REVENUE USING A SHIFT-SHARE ANALYSIS

A Report Prepared for the
Revenue and Transportation Interim Committee

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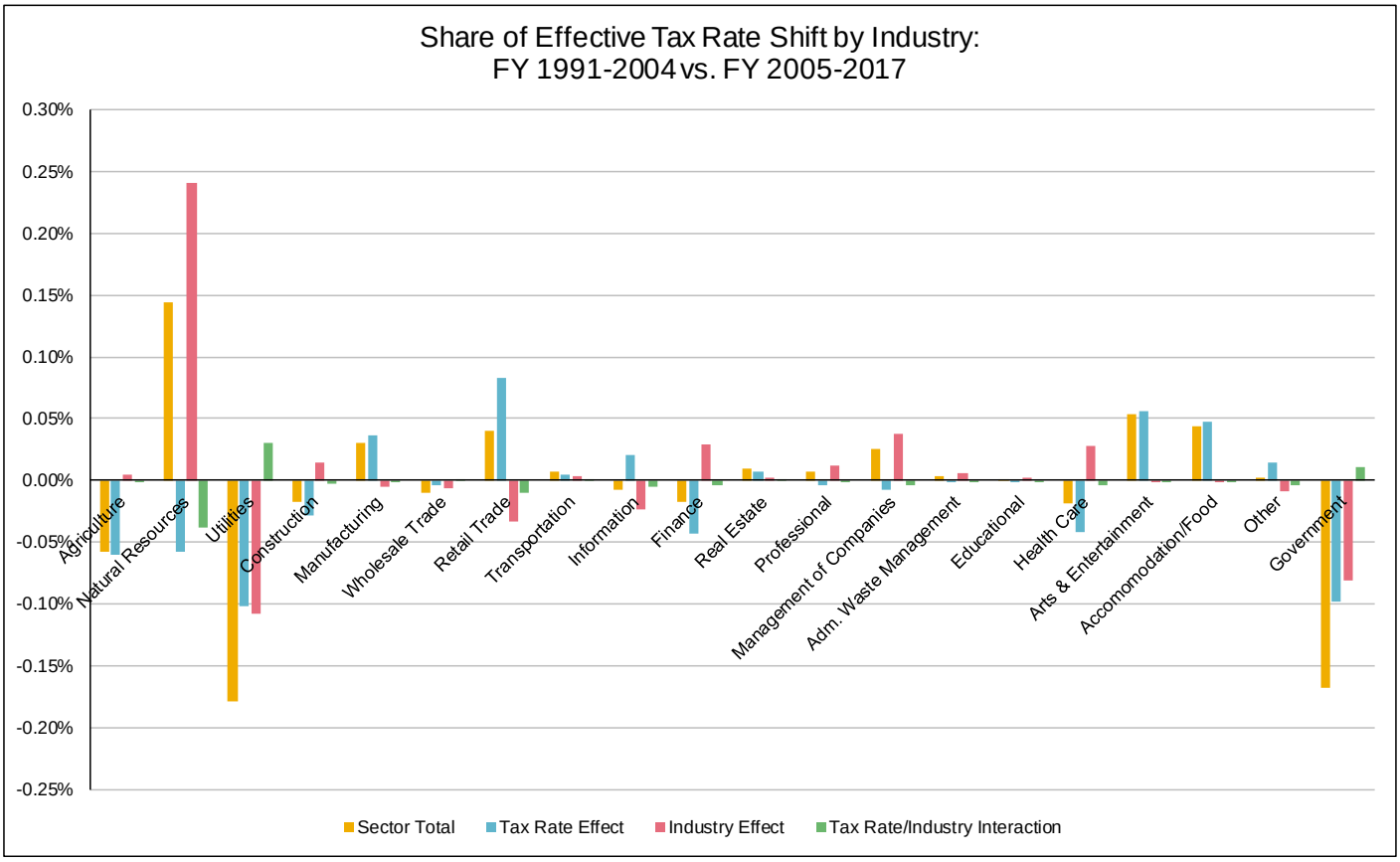
Purpose

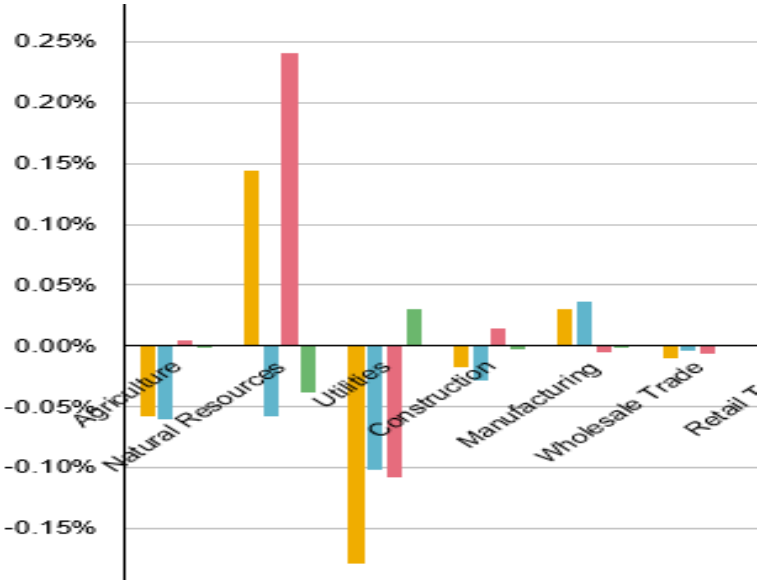
This analysis expands on the Legislative Fiscal Division (LFD) report to the Joint Subcommittee on Montana's changing economy "Montana's Industry Sectors: Comparing Jobs, Personal Income, Gross State Product, and General Fund Revenue Share". In that report, historical general fund revenues were categorized into various industry sectors using the North American Industry Classification System (NAICS). Each sector was then analyzed individually, studying its share of gross state product (GSP), personal income, jobs, and tax revenue and their shifts over time. As was expected, those sectors with industry-specific taxes (such as natural resources, insurance, and utilities) had the highest effective rates.

As a follow-up to this report the LFD was requested to further study the drop in general fund revenues (GFR) as a percent of Gross State Product (GSP) that Montana has experienced. This quantity is ultimately the state's effective tax rate, defined as GFR/GSP. It is possible that legislation has reduced tax rates, or certain industries with high effective tax rates have decreased in size relative to the overall economy, or have been replaced by industries with lower tax rates, or a combination of the three. A tool in economics known as a shift-share analysis can be used to quantitatively assess these changes. The shift-share analysis can partition the decrease in revenue directly to changes in tax rates, while holding industry growth constant, and vice versa.

This report utilizes the shift-share analysis for four different time frame comparisons. The first examines the average effective tax rate of fiscal years 1991-2004 to fiscal years 2005-2017. Note that up until FY 2002 money earned on state school trust lands was deposited into the general fund. Beginning in FY 2003, these school trust land revenues were deposited into the state special guarantee fund. School trust revenues were removed from this analysis, because if they are included, it shows a more drastic drop in the government sector revenues than what truly materialized. The figure below illustrates the results of the analysis for these time periods.



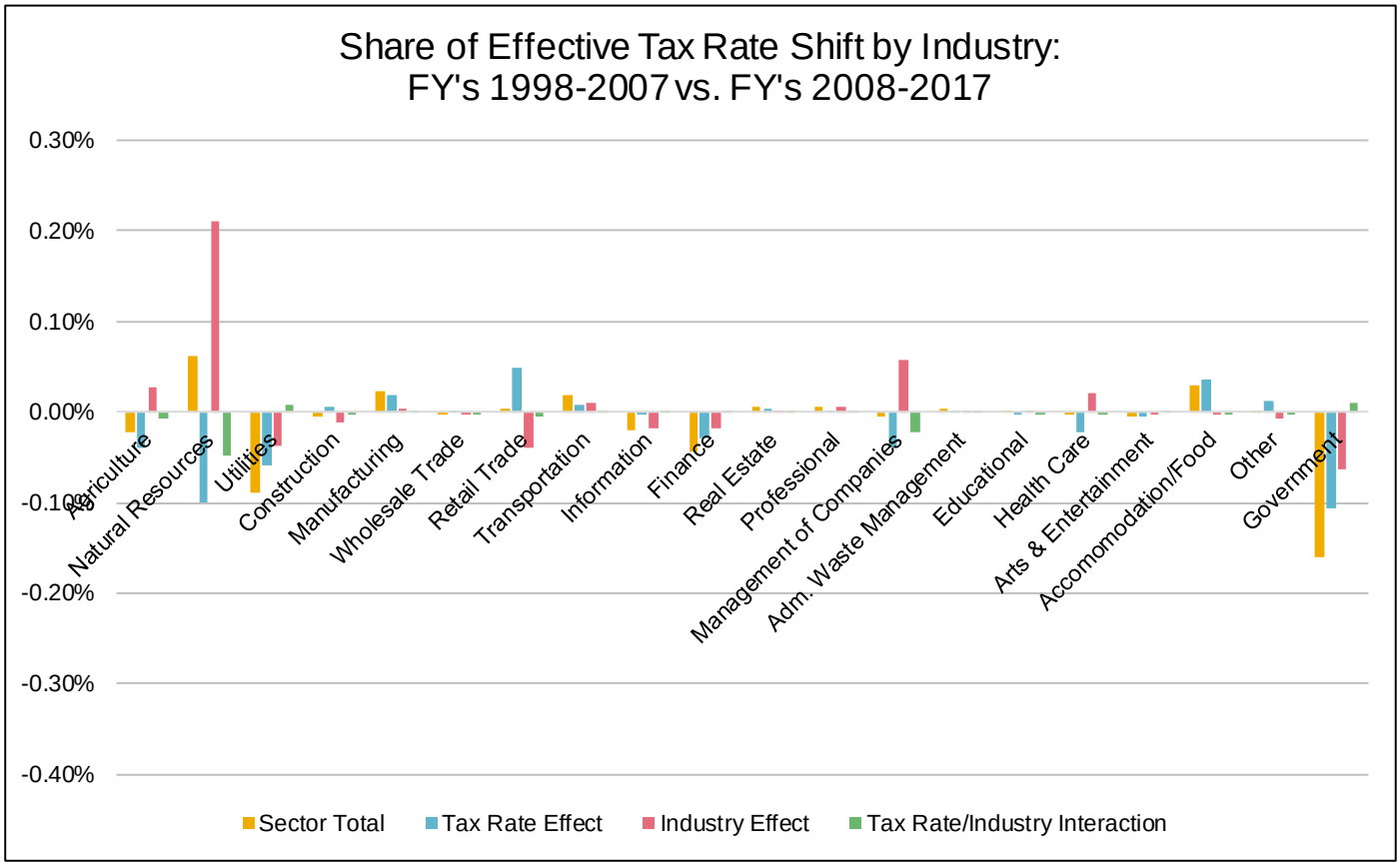
The average effective tax rate dropped by 0.11% of Montana's GSP between the two time periods shown above. This number is equivalent to the "Sector Total" bar summed across all industries. The decrease is not surprising however, as it is precisely the result that spurred this particular analysis. To better understand each share of the change in the effective tax rate, the above results will be fully explained for the natural resources sector.



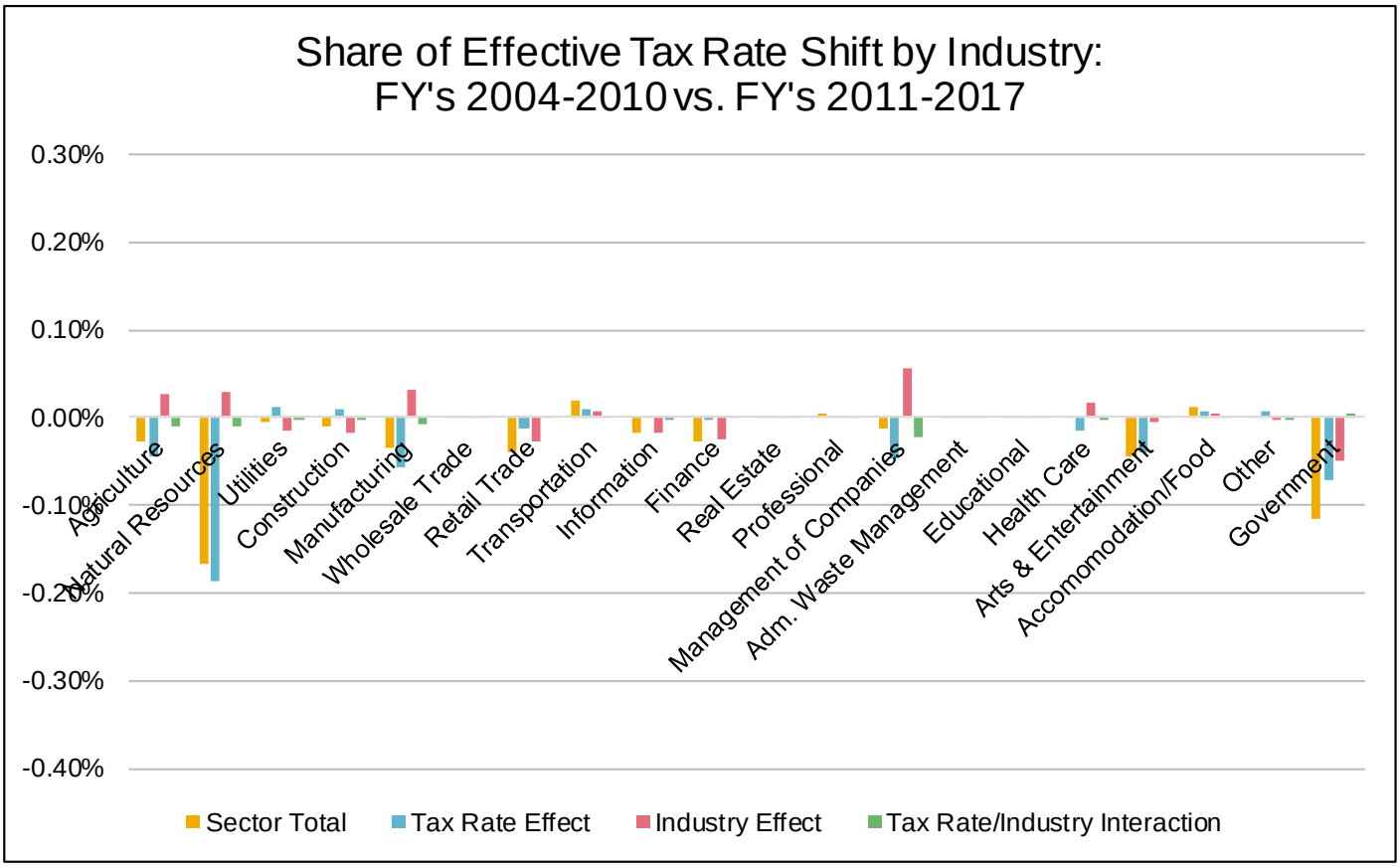
The image above is a snapshot of the figure on the previous page. As the yellow bar shows, the effective tax rate in the natural resources sector increased by nearly 0.15% of GSP across the two time periods. The blue, red, and green bars illustrate where the changes took place, and sum to 0.15%. The tax rate effect (blue bar) shows a decrease of 0.06% of GSP. This can be explained by a change in tax rates based on when the well was drilled. Those drilled prior to 1999 are taxed at 12.5% while those drilled after are taxed at 9.0%. When examining the industry effect (red bar) while holding tax rates constant the effect is strongly positive. To be specific, growth in the natural resources industry increased Montana's overall effective tax rate by 0.24% of GSP. Oil activity in Elm Coulee throughout the 2000's was responsible for this increase. Finally, the interaction between the tax rate effect and industry effect (green bar) decreased Montana's effective tax rate by 0.04% of GSP.

While the natural resources sector had a positive effect on the state's total effective tax rate, this was offset by decreases in other sectors, specifically the utilities and government sector. Deregulation of the utility sector in the late 1990's explains the decrease in this sector. Decreased interest earnings, specifically from the Treasury Cash Account and Coal Permanent Trust are responsible for the decreases attributable to the government sector. A material, though smaller, decrease occurred in the agriculture sector, and was driven by a decrease in the tax rate.

To gain an understanding in how these shifts have occurred across different time periods this analysis was performed multiple times. The first compared the last two decades, that is, the 1998-2007 decade compared to the 2008 to 2017 decade. This time period also shows a decrease in the state's effective tax rate, this time of 0.20% of GSP. The most pronounced decrease was in the government sector, once again due to a decrease in interest earnings. Residual effects from the deregulation of utilities can still be observed. The figure below shows each sector's component.

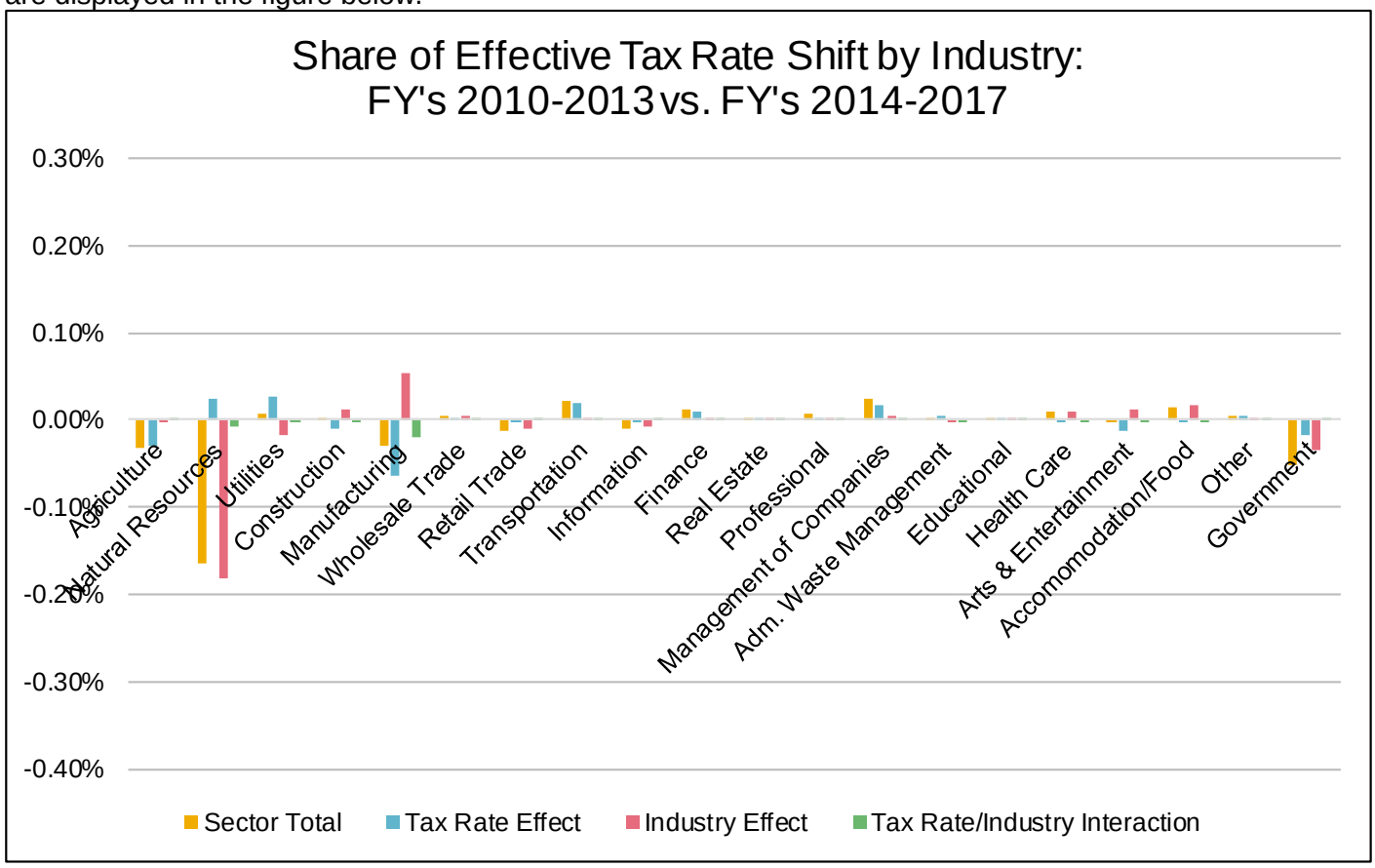


Next, the seven years prior to the recession were compared to the seven post-recession years. The results are displayed in the figure below.



The effective tax rate dropped by 0.45% of GSP across the two time periods, and was primarily due to a drop in the natural resources and government sector. While the natural resources industry effect grew, the tax rate effect dropped substantially. Once again, this is likely due to an 18-month tax holiday period for newly completed wells as well as a reduced tax rate for producing wells drilled after 1999. From the figure above, most sectors saw a net decrease across those two time periods. The decrease was primarily driven by a negative tax rate effect, as many sectors actually saw growth in the industry effect.

One final analysis was performed comparing fiscal years 2010-2013 to fiscal years 2014-2017. The results are displayed in the figure below.



The average effective tax rate dropped by 0.19% of GSP across the two time periods shown above. Of this drop, -0.16% was attributable to the natural resource sector, specifically its industry effect. This illustrates the decline in oil activity in Eastern Montana as prices dropped in FY 2015. The remaining decreases were seen in the agriculture and government sectors.

The shifts in the makeup of Montana's industries coupled with changes in various sectors' effective tax rates have produced a material drop in Montana's combined effective tax rate. The magnitude of the drop depends on the timeframes used in the analysis. The following table summarizes the findings from the analyses above.

Beginning Timeframe	Ending Timeframe	Change in Effective Tax Rate	Primary Reasons for Change
1991-2004	2005-2017	-0.11%	Policy change in the utility sector, low interest rates
1998-2007	2008-2017	-0.20%	Residual effects from utility policy change, low interest rates
2004-2010	2011-2017	-0.45%	Decreased tax rates in natural resources, low interest rates
2010-2013	2014-2017	-0.19%	Decreased natural resources industry