POLICY brief

Washington Research Council

PB 07-06 February 27, 2007

BUILDING US UP FOR A FALL? CONSTRUCTION AND STATE TAX REVENUE

BRIEFLY

Construction earnings as a share of Personal Income is at a 25-year high in Washington State. A reduction in the share back to normal levels would restrain the growth in state tax revenues, even if the overall economy were to remain strong.

In an earlier brief on Governor Gregoire's proposed budget for 2007–09, we warned that the state may experience below average revenue growth over the next four years (WRC 2007). This brief provides more detail on that point.

The reason to expect below average growth going forward is that state revenue (particularly from the sales tax) is sensitive to the share of construction in economic activity. Construction's share is at a 25-year high; a reduction in the share back to normal levels would restrain the growth in tax revenues, even if the overall economy were to remain strong.

SALES AND USE TAX BASE GROWTH VERSUS PERSONAL INCOME

The retail sales tax and its companion use tax together provided $7.3 billion to the state general fund in fiscal year 2006. This represented 56 percent of the $13.3 billion general fund-state revenues for the year. In contrast, for fiscal year 1975, sales and use taxes totaled $662.3 million.

Over time, tax revenues change both because of changes in the level of economic activity and because of changes in tax laws. For example, between fiscal years 1975 and 2006 Washington personal income, a measure of economic activity in the state, grew from $22.4 billion to $229.4 billion; certain goods were exempted from the sales tax, notably food purchased for off premises consumption (groceries, for short), manufacturing machinery and used cars, while the state sales and use tax rate increased from 4.5 percent to 6.5 percent.

When studying the performance of tax systems, careful analysts distinguish between these two sources of change. Important tools to this end are constant tax base series, which hold fixed the definition of what is subject to tax. Washington State's Office of the Forecast Council (OFC) maintains constant base series for the state's major taxes. The OFC base reflects state tax law as of 1973.

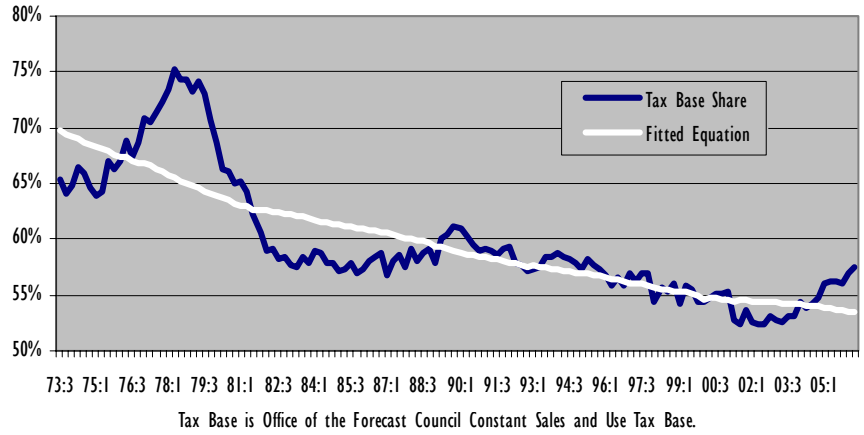
Chart 1 makes use of the OFC constant base series for Washington's sales and use taxes. Shown is the ratio of the general fund sales and use tax base to state personal income (the tax base share, for short) over 34 years, beginning with the third quarter of 1973 and ending with the second quarter of 2006.

Over the 1975–1978 period, the sales and use tax base share grew from 65 percent of personal income to 75 percent. This dramatic growth allowed the general fund to easily weather Initiative 345, approved by voters in November 1977, which exempted groceries from the sales and use taxes, reducing the sales tax base by more than 10 percent. (By construc-

Washington Research Council
108 S Washington St., Suite 406
Seattle WA 98104-3408
voice: 206-467-7088
fax: 206-467-6957
www.researchcouncil.org

tion, this change is not reflected in the constant sales and use tax base series and, therefore, does not appear on Chart 1.) Even with the loss of this much base, legislators were able to reduce the sales tax rate from 4.6 percent to 4.5 percent in 1979.

Chart 1: Sales and Use Tax Base Share of Personal Income, 73:3–06:2



The subsequent fall in the tax base share was even more dramatic, however. By 1983 the sales and use tax base was 57 percent of personal income. This drop was largely the source of the rolling fiscal crisis that defined the John Spellman governorship.

In the latter half of the 1980s the tax base share grew modestly, reaching a cyclical peak of 61 percent of personal income in the last quarter of 1989. During the1990s, the share declined, so that by 2000 it was 55 percent. It fell to 52 percent during the 2001–03 recession. From that low, it has grown to 58 percent of personal income.

Personal income is a key variable in the standard models used by economists to explain the growth in the sales and use tax base (Holcombe and Sobel 1997, Chapter 5; WSTSSC 2002). The simple intuition for this choice interprets the sales tax as a tax on consumption. As personal income rises, consumption expenditures rise, and some of the incremental purchases are of goods and services that are subject to the sales tax. The situation is actually a bit more complex than this, however, as the sales tax base includes business purchases as well as consumer purchases. (The Washington State Department of Revenue estimates that 36 percent of retail sales and use taxes come from purchases by businesses.) Personal income is better thought of as a proxy for the general level of economic activity, which determines both consumer and business purchases of taxable goods and services.

The appendix to this brief presents a simple model relating the ratio between the sales and use tax base and personal income to the level of personal income and least squares estimates of the parameters of that model. The "r^2" of this regression is 0.705, meaning that personal income alone "explains" 70.5 percent of the variation of the sales and use tax base share.

We plot fitted values from this regression on Chart 1. The fitted values curve slopes downward indicating that the sales and use tax base share has tended to decline as personal income has grown. (It is important to remember, however, that the base used in constructing the curves on Chart 1 includes groceries, which are now exempt in Washington. Without groceries, the decline in the tax base share of personal income would be much less severe. See the discussion in the appendix.)

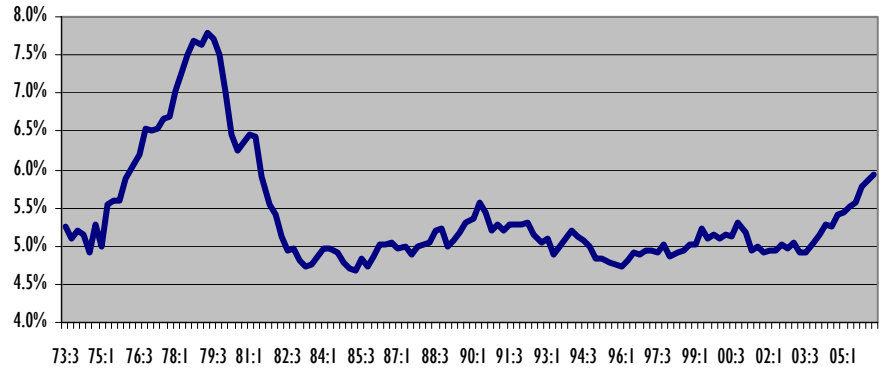
Personal income by itself does not explain the spike in the ratio between the tax base and personal income experienced in the late 1970s. Nor does it explain the run up in recent years.

CONSTRUCTION

Construction largely explains these deviations.

The level of construction activity has a powerful impact on sales tax revenues. The simple story focuses on the fact that the state collects sales tax on construction labor. (Washington is one of the few states to do so.) Thus a dollar of earnings in the construction sector is fully taxed when it is earned as well as partially taxed when it is spent. This suggests that earnings from the construction sector should have a larger impact on sales and use tax revenue than other earnings. But the direct impact of construction activity on sales and use tax revenues extends beyond construction labor. The state collects sales and use taxes on construction materials as well as on complementary furnishings such as furniture and appliances.

Chart 2: Construction Earnings Share of Personal Income, 73:3–06:2



Source: Bureau of Economic Analysis

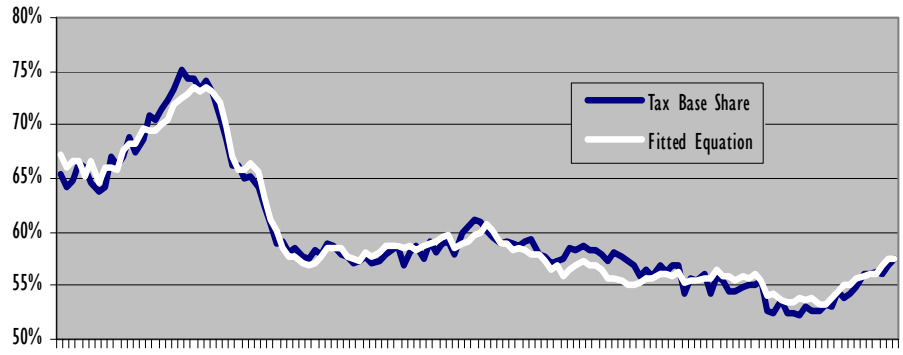
Construction earnings can serve as a proxy for all of the taxable activity associated with construction.

Chart 2 shows the ratio of construction earnings to personal income (construction earnings share). The congruence between the construction earnings share and the sales and use tax base share is striking.

Construction activity was very strong in the state in the late 1970s. Construction earnings, which had averaged 5.1 percent of personal income in 1974, peaked at 7.8 percent of personal income in the second quarter of 1979 and then declined to 4.8 percent in 1983. Home construction is part of the story. Housing permits hit a peak of 71,200 (annualized) in the fourth quarter of 1977. (Contrast this with the peak of the most recent cycle, 57,700 in the fourth quarter of 2005, for an economy with twice the employment.). These were also the years when the "Whoops" nuclear plants were under construction.

Chart 3: Sales and Use Tax Base Share of Personal Income, 73:03–06:2

Independent variables in fitted equation are personal income, construction earnings share and the unemployment rate



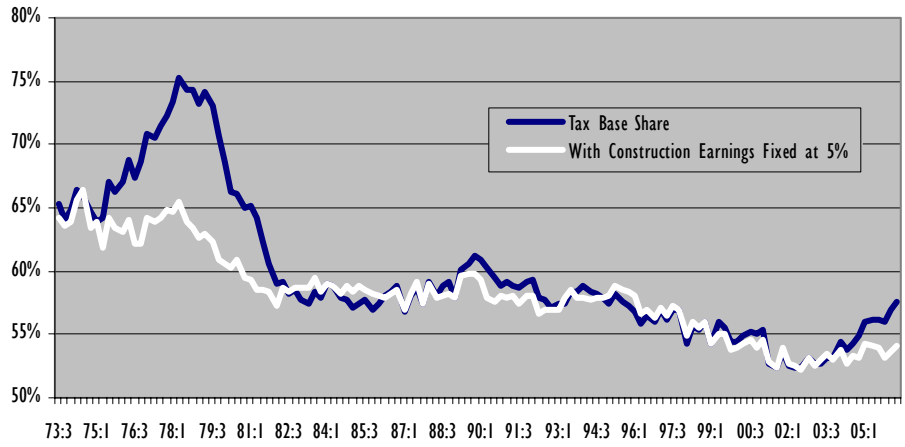
Tax Base is Office of the Forecast Council Constant Sale and Use Tax Base

More recently, construction earnings have grown from 4.9 percent of personal income in the second quarter of 2003 to 5.9 percent in the second quarter of 2006.

The technical appendix presents a model relating the ratio of the sales and use tax base and personal income to three variables: personal income, the ratio of construction earnings to personal income, and the unemployment rate. We estimate the model statically and find that it explains 96 percent of the variation in the sales and use tax base share.

As Chart 3 shows, the model tracks the spike in the tax base share during the late 1970s and the collapse in the early 1980s. It picks up the increase in the late 1980s, the decline in the 1990s, the recessionary dip and the current upswing.

Chart 4: Sales and Use Tax Base Share of Personal Income, 73:03–06:2



Tax Base is Office of the Forecast Council Constant Sales and Use Base

To isolate the impact of construction on the sales and use tax base share, we use the estimated coefficient for construction earnings share to calculate what the sales and use tax base share would have been had the construction earning share remained fixed at 5 percent (its value in the fourth quarter of 2003) over the whole period. That hypothetical is graphed along with the basic sales and use tax base series on Chart 4.

The vertical distance between the curves is the effect of deviation of the construction earnings share from 5 percent.

The construction earnings share stood at a bit more than 5.9 percent in the second quarter of 2006. Applying the current 6.5 percent state tax rate, the tax base difference shown on Chart 4 from the first quarter of 2004 through the second quarter of 2006 is worth $722 million. The difference in the second quarter of 2006 alone is worth $533 million when annualized.

DISCUSSION

Construction activity has a powerful impact on state revenues. And changes in state policy that reduce the level of construction activity will, therefore, have an impact on the general fund. Legislators should keep this fact in mind as they consider bills such as SB 5046, which, by increasing the liability exposure of contractors, could reduce the level of residential construction activity in the state.

The state's deep fiscal crisis of the early 1980s stemmed from the unwinding of a historic construction boom. This experience left a widely held belief that the heavy reliance on the sales tax makes Washington's tax system more volatile than most. This is not the case, as the last recession clearly demonstrated. The Washington State Tax Structure Study Committee—commonly known as the Gates Committee—concluded: "The sales tax, though volatile, is less volatile than a graduated personal income tax. There is no evidence that a flat rate personal income tax would be less volatile than the sales tax" (WSTSSC 2002, Vol. 1 pp. 25-26).

The last few years have been kind to state budget writers, as upward revisions to the state revenue forecast have followed one after another with numbing regularity. Many have come to believe that this is normal. This is a dangerous belief.

While state revenue forecasts may have a conservative bias, a large contributor to the revisions was the failure by forecasters to anticipate the strength of the construction in the state. Construction has been a key driver of economic growth over the last several years, and as we have demonstrated, the level of

construction activity has a powerful impact on state revenues, even when the overall level of economic activity in the state is held fixed.

The share of construction earnings in personal income was 5.925 percent in the second quarter of 2006. This is the highest level in 25 years, and could well mark the peak of this cycle. (The preliminary numbers released by the Bureau of Economic Analysis show the construction earnings share at 5.813 percent in the third quarter, but given the typical revisions to personal income and earnings numbers, we should not make too much of this yet.)

The state's November Economic Forecast shows construction employment as a share of total employment peaking in the first quarter of 2007. From that point, construction's share of employment declines continuously through the end of the forecast period (the fourth quarter of 2009).Consequently, the associated November Revenue Forecast has revenue growth decelerating significantly in the 2007–09 biennium from the pace set in 2005–07 (OFC 2006).

The recently released Preliminary February Economic Forecast contains an ominous piece of news:

> The number of housing units authorized by building permit plummeted 11,100 in the fourth quarter of 2006 to 42,200 from 53,300 in the third quarter. Single-family permits declined 5,600 to 29,700 and multi-family permits fell 5,500 to 12,500. Total permits in the fourth quarter were the lowest since the fourth quarter of 2003 and single-family permits were the lowest since the first quarter of 2002. (OFC 2007)

Economic and Revenue Forecast Council Executive Director ChangMook Sohn notes that this unanticipated drop "could be a sign of a significant down turn in housing," or, alternately, it could just be a "temporary aberration." The new economic forecast assumes that the drop is a temporary aberration, that housing permits will rebound later in 2007 so that the relative decline in construction will be gentle. This assumption of a rebound in permits will underpin the upcoming March Revenue Forecast. If permits do not rebound, that revenue forecast will need to be adjusted downward eventually.

The last downswing in construction earnings' share lasted for nearly 6 years (from the second quarter of 1990 to the first quarter of 1996) and the next downswing could last well into the 2009–11 biennium. The result would be a long period over which state revenues grew at less than their long-term trend.

Legislators should exercise caution as they write a budget for the 2007–09 biennium. Unlike the experience of recent years, above trend growth is unlikely to erase any structural budget deficit.

APPENDIX: DETAILS OF THE ANALYSIS

The standard model used to estimate the relationship between tax base (B) and personal income (Y) is linear in the natural logarithm (ln) of the two variables:

$$\ln(B_t) = \alpha + \gamma \cdot \ln(Y_t) + \varepsilon_t \quad (1)$$

Subscripts on variables indicate dates. (Our data are quarterly.) The "error" term in the equation, ε, captures all the factors other than personal income that influence tax revenue. With this functional form, the slope coefficient, γ, directly measures the "elasticity" of revenue with respect to personal income: A 1 percent increase in personal income results in a γ percent increase in tax revenue (Holcombe and Sobel 1997, Ch.5; WSTSSC 2002, Appendix C-21).

Subtracting the natural logarithm of personal income from both sides of equation (1) and applying the property that the difference between the logarithms of two numbers is the logarithm of their ratio yields the equation:

$$\ln(B_t / Y_t) = \alpha + \beta \cdot \ln(Y_t) + \varepsilon_t \quad (2)$$

The constant α and the error term ε in (2) are identical to the constant and error in (1). The slopes β and γ are related by

$$\beta = \gamma - 1$$

Least squares estimates of equation (2) over the period 1973:3 to 2006:2 appear in column (a) of Table A-1 (on page 8). Fitted values are plotted on Chart 1 (page 2). The estimated coefficient on the log of personal income is –0.105, implying that the elasticity of the sales and use tax base with respect to personal income is 0.895. The downward slope in the fitted equation on Chart 1 manifests the fact that the estimated elasticity is less than 1.

Recall, however, that the sales and use tax base we are using reflects Washington tax law circa 1973, at which time food for off premises consumption was subject to tax. Holcombe and Sobel demonstrate that including food in the sales tax base significantly lowers the elasticity (Holcombe and Sobel 1997; see also Tannenwald 2004, p. 14). Nationally, the Bureau of Economic Analysis National Income and Product Accounts show that personal consumption expenditures fell from 16.4 percent of personal income in 1975 to 11.7 percent of personal income in 2005. The current state sales and use tax would show a somewhat greater personal income elasticity.

Next we expand equation (2) to include the ratio of earnings in the construction sector (E^C) to personal income and the unemployment rate (U) as explanatory variables:

$$\ln(B_t / Y_t) = \alpha + \beta_1 \cdot \ln(Y_t) + \beta_2 \cdot \ln(E_t^C / Y_t) + \beta_3 \cdot U_t + \varepsilon_t \quad (3)$$

The results of estimating this equation for the 1973:3 to 2006:2 period are shown in column (b) of Table A-1, with fitted values plotted on Chart 3 (page 3). With these two variables included, the r^2 is considerably higher (0.961 vs. 0.705) and the elasticity with respect to personal income is somewhat higher (0.991 vs. 0.895).

Six additional regressions are reported in Table 1.

Columns (c) and (d) show the effect of omitting either construction earnings share or the unemployment rate from equation (2). Inclusion of the unemployment rate reduces the personal income's coefficient (compare [d] to [a] and [b] to [c]), while it also reduces construction earnings' coefficient (compare [b] to [c]). Adding the construction earnings share raises personal income's coefficient (compare [b] to [d] and [c] to [a]).

Columns (e), (f) and (g) repeat the specifications in (a), (b) and (c), but estimate over a time period (1982:3 to 2006:2) that excludes the big spike in the construction earnings share of personal income. Coefficient estimates (f) and (g) are not that much different from (b) and (c), indicating that the results for the impact of construction on sales and use tax revenue are not driven solely by the 1973:3 to 1982:2 data.

Note, however, that in the case of the simple specification where the tax base share is a function of personal income alone, the time period does matter. The implied elasticity of the sales and use tax base in column (e) is 0.940, as compared to 0.895 for column (a). The lower elasticity in the latter case appears to be an artifact of the construction boom of the late 1970s.

Finally, column (g) shows the result of including an auto regressive error in the specification. Again, the effect on the coefficient estimates is not large.

On Chart 4, the curve labeled "With Construction Earnings Fixed at 5%" plots the equation

$$Z = \left(B_t / Y_t\right) \cdot 0.05^{\,b} \Big/ \left(Y_t / E_t^{\,C}\right)^{b}$$

where *b* is the coefficient on the natural log of construction earnings from regression (b). This adjusts sales and use tax base as a share of personal income to a constant 5 percent construction earnings share of personal income.

Table A-1: Regression Results

The Dependent Variable is the Natural Log of the Sales and Use Tax Base Divided By Personal Income

(Standard Errors of Coefficients in Parentheses)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Constant	0.671371	1.627225	1.499322	1.093316	0.136811	1.607754	1.537924	1.571397
	(0.06730)	(0.04217)	(0.04537)	(0.08469)	(0.07206)	(0.15073)	0.182122	(0.09074)
Natural Log of Personal Income	-0.104978	-0.088609	-0.073354	-0.130963	-0.060067	-0.098428	-0.077046	-0.095825
	(0.00593)	(0.00322)	(0.00289)	(0.00636)	(0.00616)	(0.00535)	(0.00519)	(0.00736)
Natural Log of Construction Earnings		0.368965	0.405147			0.320685	0.403158	0.320446
Share		(0.01522)	(0.01703)			(0.04302)	(0.04991)	(0.03114)
Unemployment Rate		-0.008541		-0.017854		-0.009812		-0.00901
		(0.00118)		(0.00262)		(0.00147)		(0.00231)
AR(1)								0.67705
								(0.06804)
Adjusted r-squared	0.704899	0.96062	0.945636	0.784882	0.497809	0.803084	0.701708	0.977666
Sample	73:3-06:2	73:3-06:2	73:3-06:2	73:3-06:2	82:3-06:2	82:3-06:2	82:3-06:2	73:4-06:2

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