

An Analysis of Withheld Income & Employment Tax Receipts

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Introduction

Growth in the number of jobs and in wage levels are among the most closely watched economic indicators of the U.S. economy, with the Bureau of Labor Statistics' (BLS) payroll survey the mostly widely followed source of information.

Although still a work in progress, we present here a new analysis of a less widely tracked statistic: federal receipts of payroll withholding taxes. This statistic has two advantages over the BLS payroll survey:

- The data become available one day after taxes are deposited to the U.S. Treasury.
- The series covers *all* {WHAT ABOUT FEDERAL?} employers. It is not a sample, and filing accuracy by employers is mandatory.

Unfortunately, though, working backwards from the data to get a clear picture of what is happening in the labor market is unusually complex, but much of that complexity can be overcome. At present, we can get some useful quantitative signals and checks against other statistics; ultimately we hope to be able to provide a more timely and accurate indication of changes in the employment picture than currently can be provided by the BLS.

Accordingly, we publish this detail for comment and suggestions from subscribers and the viewing public. To offer a comment, click use our website [Contact Form](#).

Background: Daily Withholding Tax Receipts

Every employer in the U.S. is required to deposit taxes withheld from employees' pay, together with employer's payroll taxes on a timely basis ⁽¹⁾. Payment deadlines vary depending on the date and size of the payroll.

Tax deposits are made to the U.S. Department of the Treasury, and the Treasury – as part of its daily reporting of its cash-flows – publishes a single daily number showing the previous day's total tax receipts from employers.

The raw data, however, are difficult to analyze: Deposits are concentrated on days arising from interacting payroll calendar cycles and deposit schedules. This makes the significance of daily or weekly totals, and even their comparison with prior years, difficult to quantify.

Further, since withholding tax is a non-linear function of wages, and there is a distribution of wages and personal tax situations across the population, conclusions about overall job and wage levels or growth cannot be reached easily.

The Data

As a preface to the charts which follow, it must be explained that the daily Treasury number yields a "noisy" time-series with deposit amounts varying from day to day by up to a factor of ten, or more. As such, graphs of daily deposits are next to useless in helping to analyze trends.

The pattern of deposits is not random, but the interaction of calendar effects on pay dates and tax deposit dates, make it very difficult to derive aggregate measures on a weekly or even monthly basis. In fact, it can be misleading to look at monthly figures. For example, tax deposits in July 2010 were less than those in July 2009, but this was due to the way that different tax collection dates fell in each month. From our analysis, payroll tax revenue rates in the summer of 2010 were in fact well up over the previous year.

What we have been able to construct is our own model of payroll distributions, and from this construct a series of data points representing the total deposits within standardized, four-week periods. Our standard periods are chosen to capture the same amount of payroll collection potential.

The chart in Fig.1 shows our standardized tax receipts over the past eleven years.

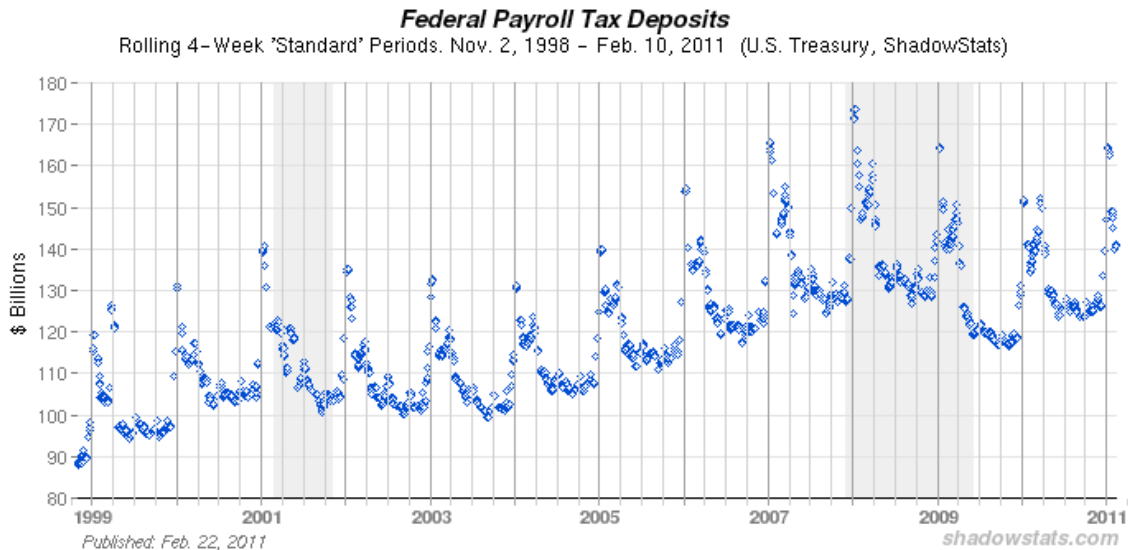


Figure 1.

Official recessions are shown in gray. Note also three major tax law changes (in addition to usual cost-of-living adjustments to tax-bands).

- Mid 2001: The “Bush Tax Cuts” take effect.
- Early 2009. Introduction of the “Making Work Pay Act” which ran until the end of 2010.
- January 2011: Reduction in Social Security tax rate.

Our derived series display the interaction of three features which we will look to separate out:

- Seasonal patterns clearly exist within each calendar year. The peaks of December and March are due to end-of-year bonus and (in the case of March) tax accounting strategies. Smaller peaks and spikes are due to seasonal patterns of employment, changes in holiday dates, a reduction in FICA receipts as the year progresses and high-earners reach the cut-off point for these taxes, and no doubt other interesting features.
- Since the IRS tax bands, exemptions and allowances change each calendar year, the overall level – even with a constant level of earnings – can be expected to change. This is particularly striking with the “Making Work Pay” change in 2009, but even without such a major revision to the tax schedules, we shall see below that percentage changes in tax bands interact with percentage changes in pay in an interesting and predictable way.
- The other main driver is, of course, the decline or growth in jobs and wages. This is of prime interest to us.

To separate those three features and get some picture of the underlying changes in employment earnings we look to the year-over-year change in the level of tax receipts.

Year-to-Year Changes

The chart in Fig. 2 shows the percentage change between one of our 4-week periods and the comparable period one year earlier.

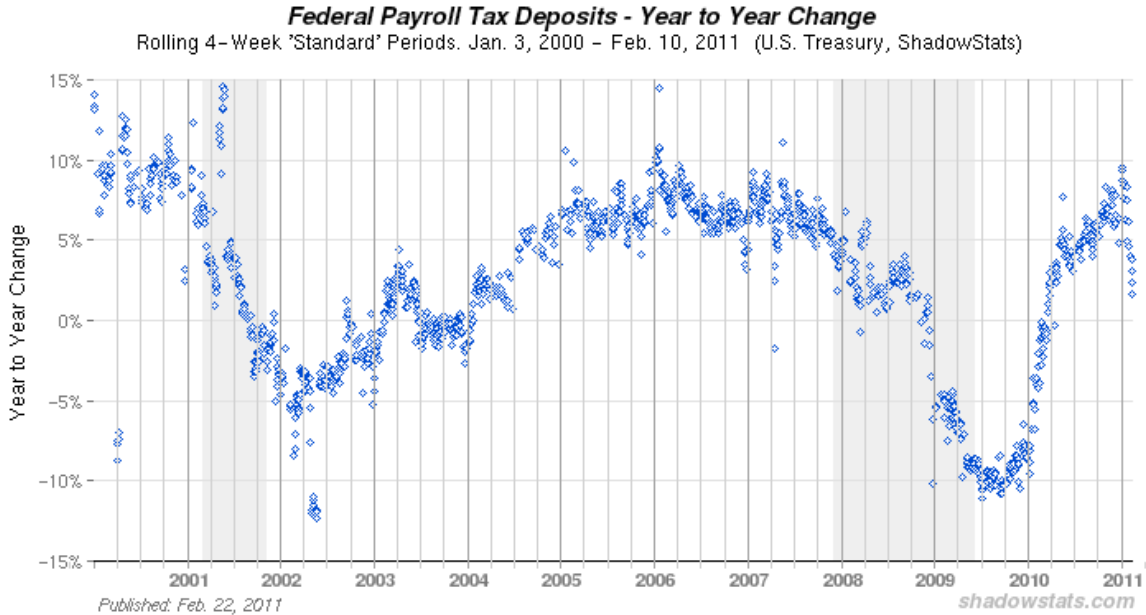


Figure 2.

There are certain striking trends and turning points in this chart. Before interpreting them, let us compare them with those of the year-to-year change in another series: The total weekly earnings estimated by the BLS. This purportedly represents the total gross pay to all private, non-farm employees, as estimated from the BLS surveys. These data are available only from March 2007 onward, but, in theory, they should be adequate for our purposes here.

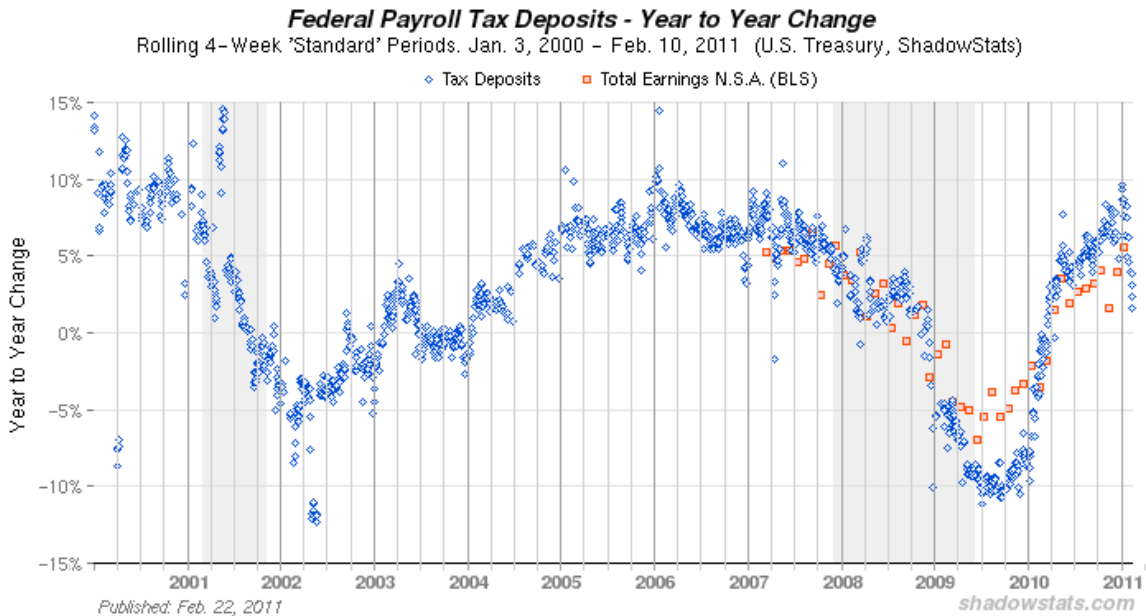


Figure 3.

When plotted together in the Fig.3, the correlation between the two series is immediately obvious. The question arises as to why they do not match more exactly. Aside from possible sampling errors by the BLS consider the following.

- The tax deposit series shows various spikes. Fundamental issues include:
 - Between December and March the year-to-year change is subject to very large variations due to comparison of bonus seasons across years, which are themselves spikes.
 - During the rest of the year most spikes appear to be related mainly to holiday effects, where a holiday falls on a different day of the week (e.g. Independence Day) or even a different week (Easter) than the year before. Even where the day of the week is fixed, as with Thanksgiving, we believe we can see payroll departments rearranging their normal schedules. (Note that the 4-week moving sum creates an artifact of echoing, negative spikes.)
- At many times, one growth rate is significantly different from the other. The answer to this likely lies in the IRS tax schedules, which can explain the differences.
 - Taxable earnings depend on many allowances and deductions which vary from individual to individual (married/single, children, mortgage payments, etc.) The IRS income tax bands are progressive: Tax rates change as taxable earnings increase. A 1% increase in an individual's pay might give rise to a much greater percentage increase in his or her total payroll tax.
 - When total earnings rise or fall, this is due to two factors: Changes in the number of jobs and changes in what each job-holder earns. We need to separate those two out to see how the total tax revenue might be affected.
 - The IRS changes its tax schedules at the beginning of each year. Thus even with no change in earnings, we can expect a change in tax receipts.

Quantitative Comparison of Treasury Department Revenue and Bureau of Labor Statistics Estimates.

Looking at July of each of the years 2007 through 2010 (in order to avoid the December through March bonus seasons), and at the year-to-year change in the *total* tax for the whole population, our estimates of the year-to-year change are shown in Column A of the table below.

Year (July)	A: Tax Yr-Yr % Change	B: Implied Average Individual Tax %Change
2007	+6.0%	+4.8%
2008	+2.5%	+3.4%
2009	-9.5%	-3.8%
2010	+4.5%	+4.5%

Now, tax receipts change for two reasons:

- The number of tax payers has changed, and
- The amount each worker earns, and thus the respective tax withholding, have changed.

Taking the BLS estimates of the number of jobs (a number that tends to get revised significantly on an annual basis), and adjust our tax series by the year-to-year change in those job numbers, we get the figures in Column B.

The Column B number gives the *average percentage change in tax per worker*. We have – to an approximation – stripped out the effect of job losses or gains. For example, If we look at the change to July 2010, we see that the total tax revenue dropped by 9.5%, but since the number of jobs dropped by 5.9% in

that period, it is as if everyone in work generated 3.8% less tax each, *on average*. [$(1 - 9.5\%) = (1 - 5.9\%) \times (1 - 3.8\%)$]

Comparison with Census Data on Household Incomes

Now, is this figure of 3.8%, and those for other years, reasonable? If we calculate the expected change in tax for a variety of individual, tax-payer circumstances, we find that they appear to be.

We take the IRS tax schedules for the years in question, and we calculate the change in payroll taxes for a range of different, theoretical households and then produce a weighted average, admittedly "guesstimated" from U.S. Census reports on household income quintiles and family type (married, children, etc.)

For each of the four years, we find that our figure in Column B falls in the range expected. In the first two years, the Column B number fell at a level commensurate with an average household earning in the \$50k - \$100k range, but in the latter two years it lies above the \$100k income level. This may be telling us that income growth has been higher among high-income households, but further work would be needed to reach any firm conclusions.

In Conclusion

There is a wealth of information hidden in the tax data, some of it harder to extract than others, and much of it with imprecise numerical values.

The information we have so far derived does fit qualitatively and quantitatively with other information, such as BLS, IRS and Census Bureau data, but adds its own new insights too.

In the immediate future we at ShadowStats hope to focus on the evolving 4-week period time-series, and to make continuing comparisons with what we are seeing from the BLS employment and other surveys.

Note:

(1) Some proportion of government employees' social security taxes is not part of these deposits, but this is a small component of the overall picture.