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Another springtime rope-a-dope?

US economic data have been relatively upbeat over the past few months. Of course, the same statement could have been made at this point last year, and at this point the year before that. In both cases the chipper mood on the economy melted away in the spring and summer months. One reason that has been put forward for this pattern is the "echo effects" in the seasonal adjustment caused by the Great Recession. Seasonal adjustment routines -- in the US almost always the Census' X-12 program -- use a variety of filters to remove what is considered to be normal seasonal variation in the data.

However, the routine could look at the deep decline in economic activity that occurred in late 2008 and early 2009 and ascribe some of that decline to normal seasonal variation. This would imply that in subsequent years the seasonal adjustment partly expects a decline in activity in the winter months, and when that doesn't materialize will conclude that the seasonally-adjusted data is performing well. The opposite pattern should play out in the summer months, when the Great Recession wasn't as severe, thus making subsequent summer data look weak. Below we examine this in more detail but first we list our three main take-aways:

- The seasonal adjustment has indeed imparted an upward bias to the data in the winter months, which has subsequently reversed in the summer months. This has occurred even though X-12 (and X-11 before it) are supposed to downweight the influence of outlier observations. It appears that in most cases the Great Recession was not treated as an outlier.
- This seasonal bias has not been the dominant reason for the summertime disappointments over the past two years. Even when judgmentally removing the Great Recession from the seasonal adjustment there still appears to have been a softening in the data in the summers of 2010 and 2011.
- This bias fades over time, and it appears that fading of the bias going from the second year after the event (in this case the winter of 2010/2011) to the third year (winter 2011/2012) is fairly steep, so the echo effects should have a much smaller influence on the data currently -- and in this coming summer -- than in the prior two years.

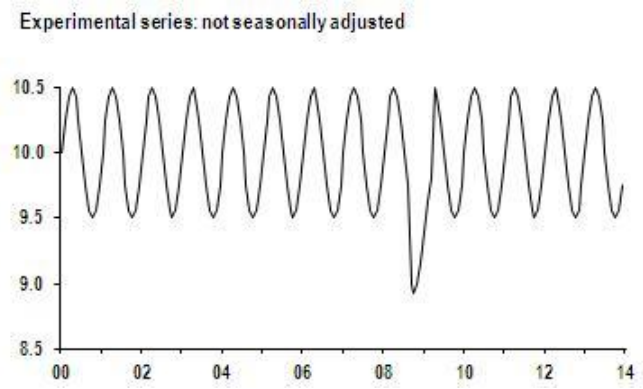
Below are the details behind these conclusions.

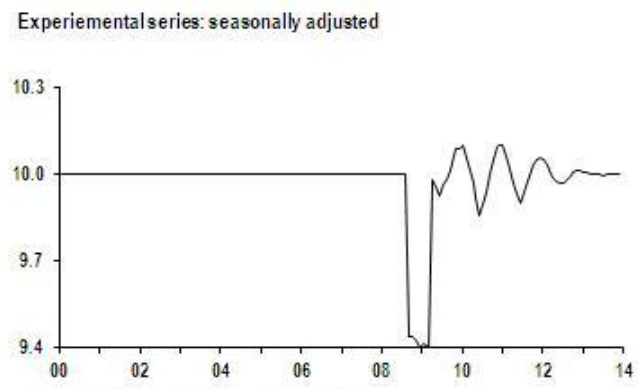
First, to demonstrate the existence of these echo effects, we construct an experimental series, with regular seasonality and an event of a magnitude similar to the Great Recession. We then run X-12 over this series, using most of the standard default parameters (and in particular, we use gamma equal to 3.3 in the additive outlier step). Since the seasonal factors will be revised, we run the seasonal adjustment routine iteratively, in order to examine the "real-time" performance.

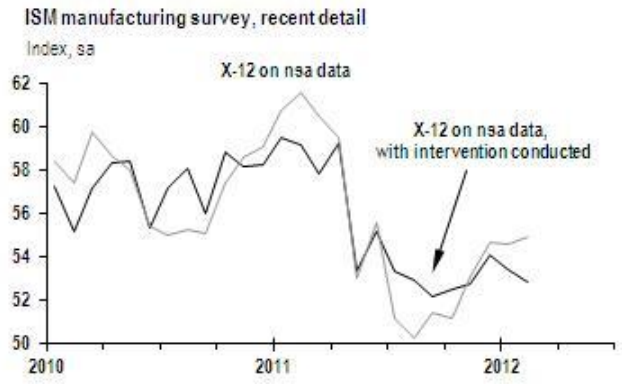
The two charts below show our unadjusted experimental series -- where the seasonality is a sine wave of frequency 2*pi/12, and our "Great Recession" is a 6% dip in the 4Q08 and 1Q09 -- and the iterated seasonally adjusted series. As can be seen, even though the only variation in the 2010 and 2011 data is, by construction, the seasonal pattern, there are echo effects in those two years. From January to June our seasonally adjusted series falls 2.4% in 2010 and 2.0% in 2011, even though we know by construction that there is no non-seasonal variation in the series in those years. In 2012, the fall is quite a bit less, down only 0.8% between January and June. Note that on revision -- that is, not looking at real time data -- the bias is less than half of what it is in real time.

The second way we examine this issue is to manually remove the Great Recession observations and re-run X-12 to determine the magnitude of the echo effect. For example, in the ISM we replace the 2008 and 2009 observations with the average monthly values in the 1998-2007 period, and run X-12 on this series and on the series without such an intervention. In this case in 2010 and 2011 we see declines in the ISM even in the series where we removed the Great Recession influence. However, the declines are not as pronounced as in the series where we don't conduct an intervention.

Finally, X-12 (and X-11) are supposed to downweight influential outliers, through the additive outlier (AO) step. However, when we run these routines over a variety of data series, the diagnostics rarely point to Great Recession observations being selected in the AO step. Apparently the federal statistical agencies are convening this summer to discuss just this issue, and to decide if the sensitivity of the outlier detection procedure is appropriate, though our third point above would suggest this may be closing the barn door after the horses have left.







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