

# On the interpretation of % changes

*“lies, damn lies and statistics”*

Reporting on a current indicator in terms of % change from prior year (12 months ago, 4 quarters, or whatever the frequency) is generally a bad idea, often deeply misleading. The problem is that a purportedly new piece of information is in fact mostly old data; in the case of monthly data, only 1/12 of the % change from a year ago is news, leading to all kinds of convoluted discussion of “base effects” and other obfuscations.

The trick with new data is to figure out exactly what information it contains – signal vs. noise. Sometimes this is hard because of seasonality, as with retail sales around the holidays or housing starts in winter. But that doesn’t justify looking back across 11 months of history when you’re trying to figure out whether things are heading up or down *right now*. This is what seasonal adjustment is for; it isn’t perfect, and it does get revised, but it does give us a provisional handle on whether a given monthly number represents a new trend, an acceleration, or just more of the same. The 12-month change tells us virtually nothing reliable.

This is not to say that historical data can’t be important. Some series are so volatile that a moving average is the only way to see any pattern at all. And sometimes what matters is how far we are below or above a previous peak. But even then the 12-month change is relevant only by accident, and the change in the 12-month % change from one month to the next is almost guaranteed to be completely uninformative. It doesn’t tell you if the indicator (e.g. inflation) is speeding up, slowing down or passing an inflection point.

A simple way to think about the uselessness of these measures is to look at the advance write-ups about what number is expected on a year-ago basis. There is a lot of verbiage about what was happening from one month to the next last year, and about the range of possible outcomes based on all the intervening data. In other words, most of it just isn’t news. We already know fairly accurately where we stand relative to a year ago – the interesting question is where we’re going now.

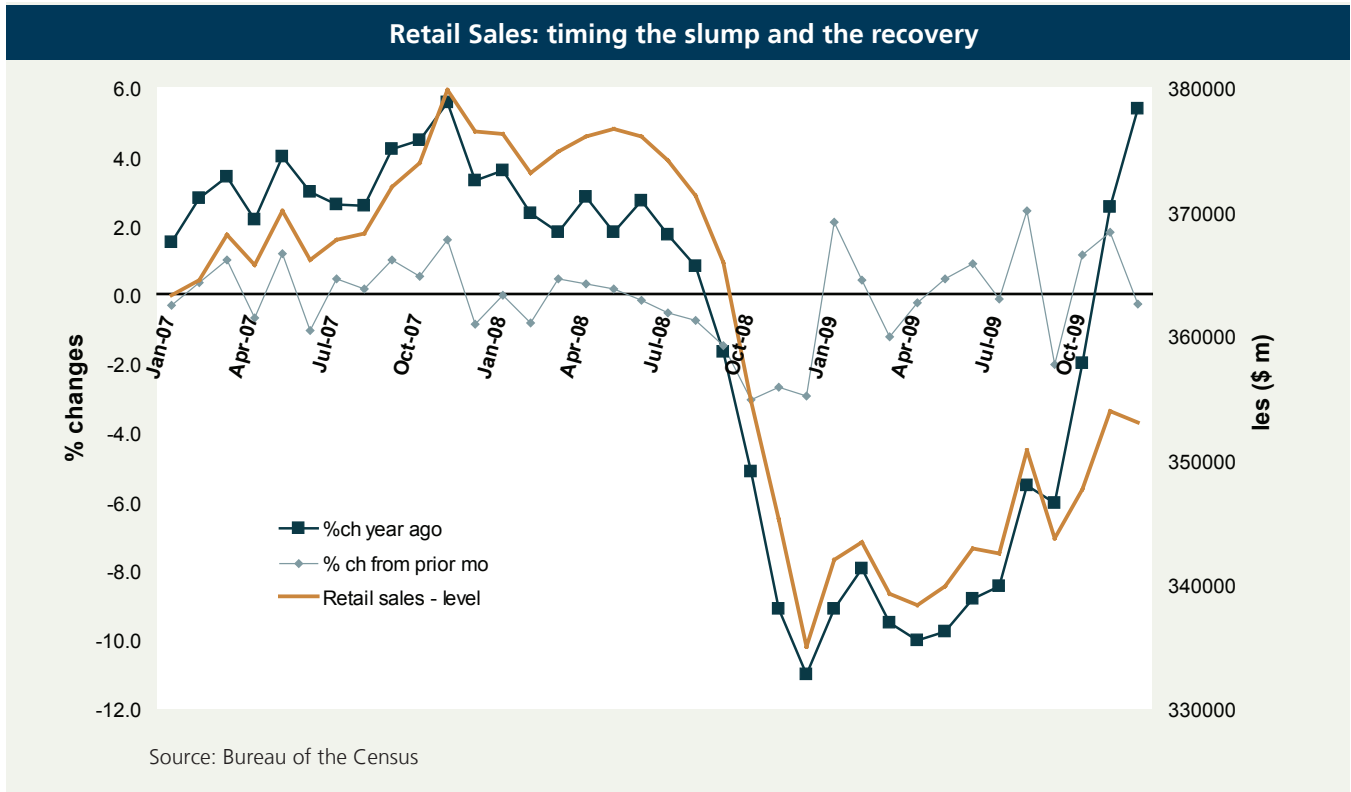
Incidentally, this is a major reason why Chinese statistics are so problematic. In many cases, most notably GDP, they provide only changes from a year ago, obscuring the true picture of what is happening right now. Rapid structural change and the difficulty of seasonal adjustment may be excuses, but there is no reason not to release the underlying data and let others dig into what it means. You can be sure the authorities use it themselves, but they evidently don’t want outside analysts to be on the same informational footing.

The graph below illustrates the point for U.S. retail sales – possibly one of the strongest candidates for thinking in 12-month changes, and certainly one where the habit is well entrenched in the financial media.

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The question is, which lines actually tell us something useful? – the % change from a year ago, the % change from last month, or the level:

- The level of sales, reported directly in millions of dollars, shows clearly how sales turned down after a secondary peak in May, 2008, bottomed out early in 2009, and struggled upward during the year. They are still in a deep hole, but climbing.
- The monthly % changes show the same reality: a string of seven negative numbers since May, 2008, followed by positive and negative months since January, telling us clearly each month whether the latest data is up or down.
- The 12-month changes continued to be positive until September, 2008, conveying a false image of resilience for at least three months into the slump. They then track the levels fairly closely until October 2009, when they start to show a dramatic recovery. Of course, this reflects comparisons to the disaster taking place a year earlier, and in no way indicates that things are even approaching normal. The fact that in November the 12-month

change was finally positive may be of psychological importance to retailers, but it wasn't news, and it didn't really mean anything – in December it was even more dramatically positive, despite the fact that sales actually declined from November on a seasonally adjusted basis.

The bottom line is that 12-month growth rates are useful only if other people fixate on them and behave irrationally as if they were news. Sometimes the truth is that a new piece of data contains very little real information, but even then the change from a year ago is virtually always inferior to other metrics.

- Bill Cheney

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