



Economics Group

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Is There Residual Seasonality in the Nonfarm Payrolls Data?

Our analysis suggests residual seasonality in the initial estimate of first quarter nonfarm payrolls since 2010. We attribute this seasonal disruption to the 2.3 million drop in payrolls in Q1-2009, the largest drop since 1945.

Residual Seasonality in the First Quarter

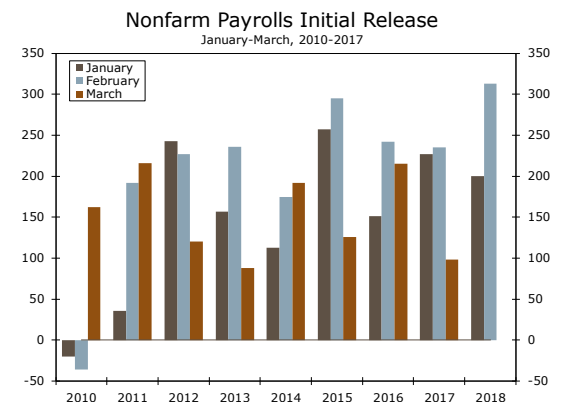
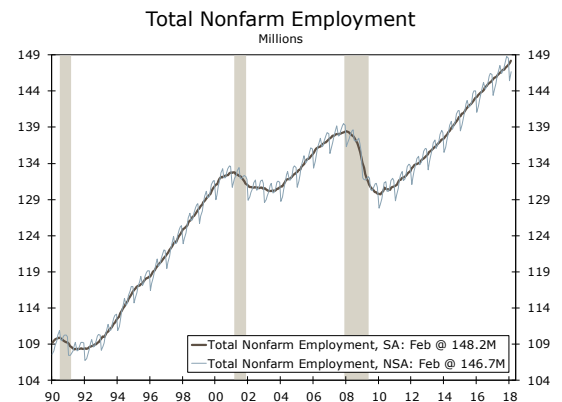
Most macroeconomic data are seasonally adjusted to remove fluctuations, or seasonal components, which can often confuse the reading of a time series. Seasonal adjustments are made to provide a clearer picture of the respective sector the data are attempting to characterize. For example, employment data are seasonally adjusted in order to reveal underlying trends and cycles in the labor market (top chart).

However, if seasonally adjusted data continue to exhibit a seasonal pattern within its data set, it could be due to residual seasonality. Although the commonly reported nonfarm payrolls numbers are seasonally adjusted, it seems that the seasonal adjustment process is unable, in our view, to completely remove all seasonal factors. Specifically, our analysis suggests residual seasonality in the initial release of Q1 data for the 2010-2017 period. In reviewing the middle chart, one will see three months (January-March) represented for each year in our sample period. A quick review of the chart reveals a pattern, which demonstrates two of the three months to be closely related, while the remaining month to be an outlier, or 'rouge' month.

The bottom table quantifies the rouge month for each year. We calculate the rogue month by measuring the absolute difference between the three months. The two months that have the lowest absolute difference signify their close relation in value, and result in the remaining month as the outlier, or rogue month. We find that a rogue month is traditionally *lower* than the average of the other two months by at least 34 percent.¹ March was the rogue month for four years in our sample period, while January was the rogue month for three years and February was the rogue month for only one year.

We attribute the key potential reason for the residual seasonality in the Q1 nonfarm payrolls data to the Great Recession. In the first three months of 2009, payrolls dropped by 2.3 million (according to revised release).² This was the largest drop in a single quarter since the third quarter of 1945. In our view, this major shift in employment could be causing seasonal disruptions. Our analysis demonstrates that although each year brings us further from the Great Recession, the residual seasonality does not appear to fade from the data set. For example, despite 2015 being six years past 2009, the difference in the first release of nonfarm payrolls from February to March was 169K. Lingering seasonal factors, therefore, remain within the nonfarm payrolls data, as outliers continue to persist within Q1.

Our initial findings lead us to believe February will likely be the rogue month in 2018. In a forthcoming report, we plan to discuss the potential outlier in 2018, as well as examine residual seasonality among the remaining quarters in our sample period. One thing remains certain from our analysis; residual seasonality exists in the initial estimate of first quarter nonfarm payrolls data.



Residual Seasonality in Nonfarm Payrolls				
Year	Absolute Difference			Outlier
	J&F	F&M	J&M	
2010	16K	198K	182K	Mar
2011	156K	24K	180K	Jan
2012	16K	107K	123K	Mar
2013	79K	148K	69K	Feb
2014	62K	17K	79K	Jan
2015	38K	169K	131K	Mar
2016	91K	27K	64K	Jan
2017	8K	137K	129K	Mar
2018	113K			

Source: U.S. Department of Labor and Wells Fargo Securities

¹ Only 2010 (rouge=March) and 2013 (rouge=February) was the outlier *greater* than the average of the other two months, by 679% and 93% respectively.
² Payrolls dropped by 1.9 million according to the first release, which was the largest drop since such data is available.

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