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Economic Pulse

Seasonal Employment

by Jim Lee

HIGHLIGHTS:

Monthly employment and unemployment data for Corpus Christi show remarkable seasonal patterns. In addition to employment in the agricultural sector, local government employment displays a distinct regular pattern within a year. Those seasonal factors could potentially bias interpretations of changes in local economic activity based on official data without seasonal adjustment.

Read this article online at stedc.atavist.com. This article benefits from conversations with CCREDC officials.



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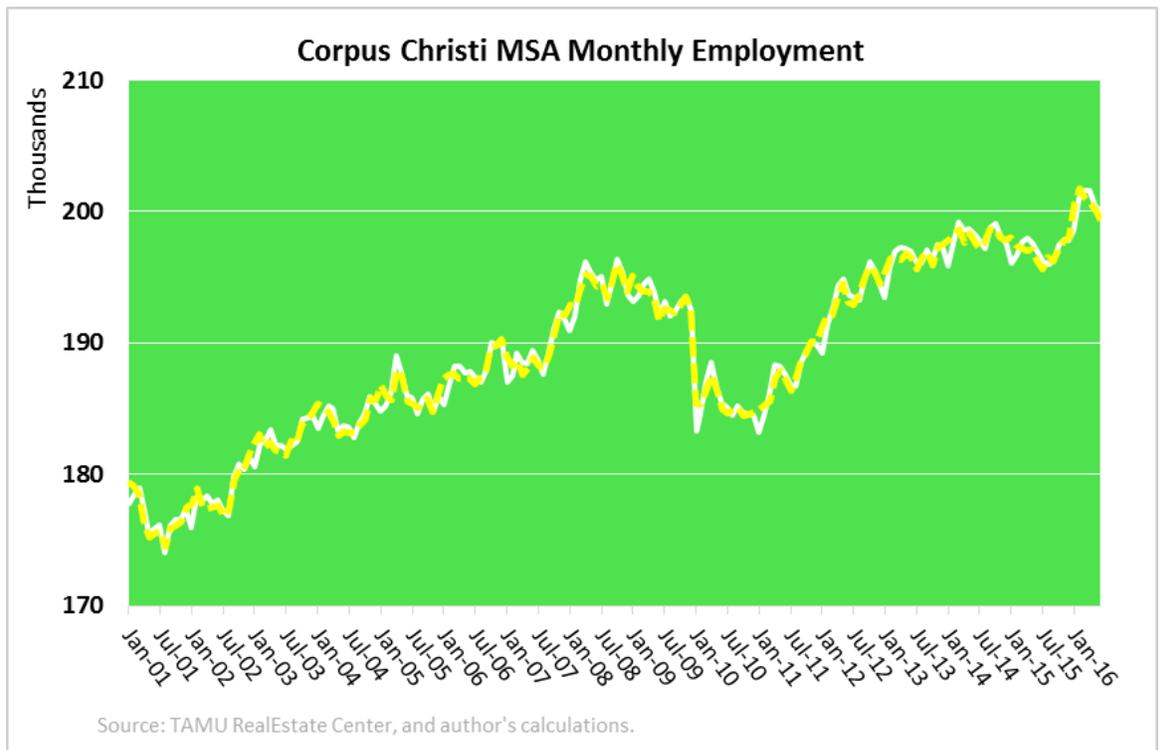
Economic activity fluctuates over time for a number of reasons. First, a typical economy tends to grow persistently over long periods of time as its population expands or its workforce becomes more productive.

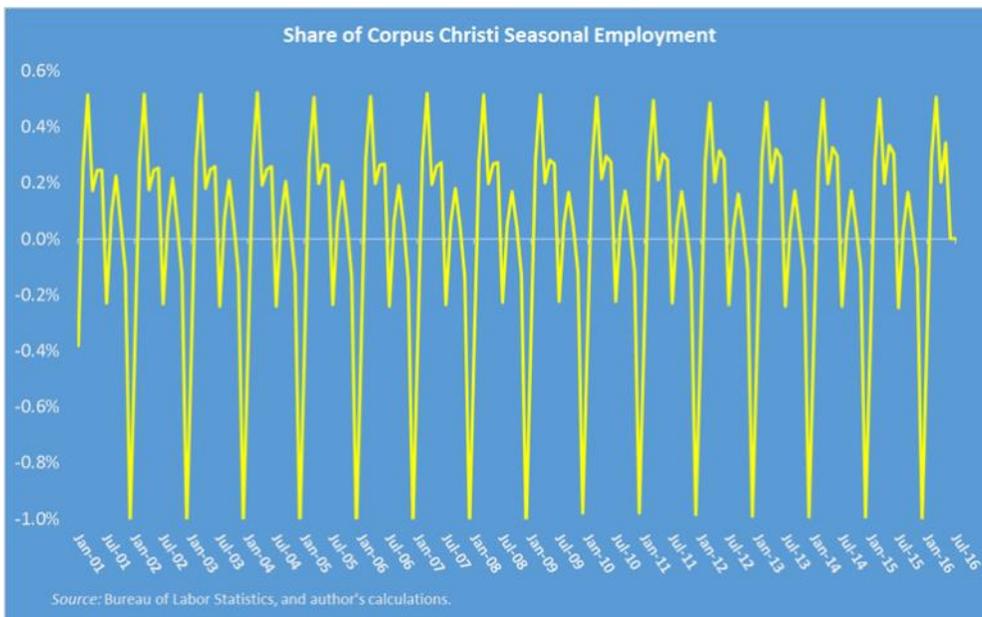
Around this long-term growth trend are ebbs and flows of economic activity that are commonly referred to as business cycles. Such fluctuations over time reflect irregular changes in overall business conditions that typically last for several years. At the national level, the U.S. has been on a gradual but modest expansion phase following the 2007-2009 Great Recession—the most severe contraction since the

Great Depression of the 1930s.

This newsletter instead focuses on yet another type of variation in economic activity, which reflects seasonal factors that tend to repeat during the same time within a year. It is natural to expect activity in the agricultural sector to speed up during harvest seasons. The level of farm employment indeed shows considerable seasonal variations.

For the United States as a whole, the peak months for farm employment are March and September. Another regular seasonally pattern occurs in retail sales, which tend to peak during the holiday season in November and December.





Official Statistics

Each month Texas Workforce Commission (TWC) releases the previous month's employment and unemployment estimates for each metro area and county within the state. The figure on the previous page plots the monthly total employment levels of the Corpus Christi metro area since 2001. The white line indicates the official data without seasonal adjustment. The yellow dashed line indicates the same data that have been subjected to seasonal adjustment.

As TWC does not report seasonally adjusted data for local areas, we computed such data using a standard statistical procedure called X-11. The pattern of the seasonally adjusted line is smoother over time than the original data. Despite this disparity, the two lines consistently display an overall

upward trend over the past 15 years as well as a major deviation from that trend at the depths of the last recession in 2009.

Seasonal Regularity

The above figure plots the shares of net seasonal employment in Corpus Christi, which are calculated by first taking the difference between the data with and without seasonal adjustment, and then dividing that difference by the level of employment without seasonal adjustment.

It is obvious that the pattern of month-to-month variations repeated every year, and the sizes of the changes were very similar over the past 15 years. A positive ratio means a higher employment level during a particular month than the average of all months within the year, and vice versa.

It is, nevertheless, instructive to know that most monthly net changes of seasonal employment were no more than 1 percent. Employment typically peaks in April, and dips the most in January with New Year holidays.

The significance of seasonal factors also shows up in the monthly unemployment statistics. The second chart on this page compares the patterns of Corpus Christi's unemployment rate with and without seasonal adjustment. Data of seasonal adjusted unemployment are obtained from the Federal Reserve Bank of St. Louis's FRED database. As for the employment data, the seasonally adjusted unemployment data are considerably more stable over time than data without seasonal adjustment.

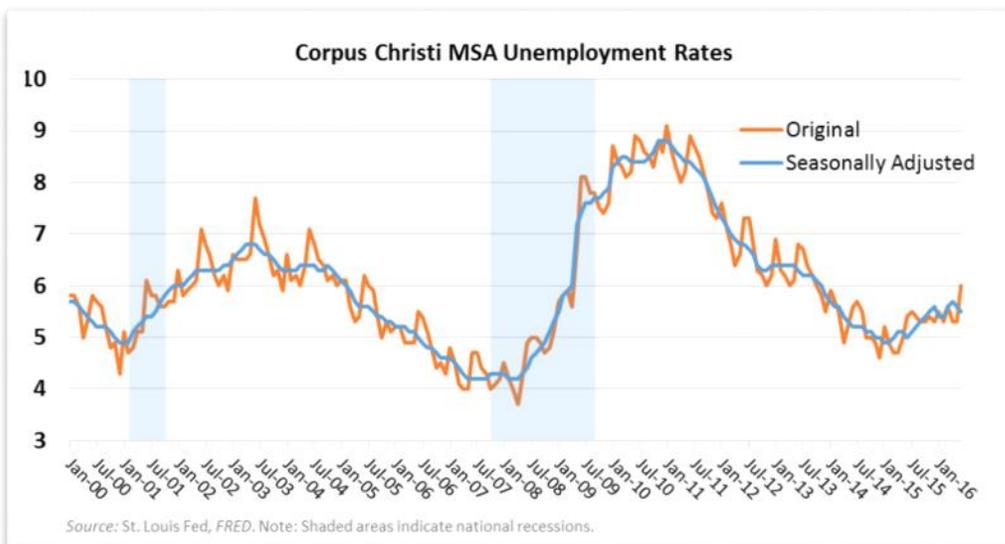
Farm and Nonfarm Employment

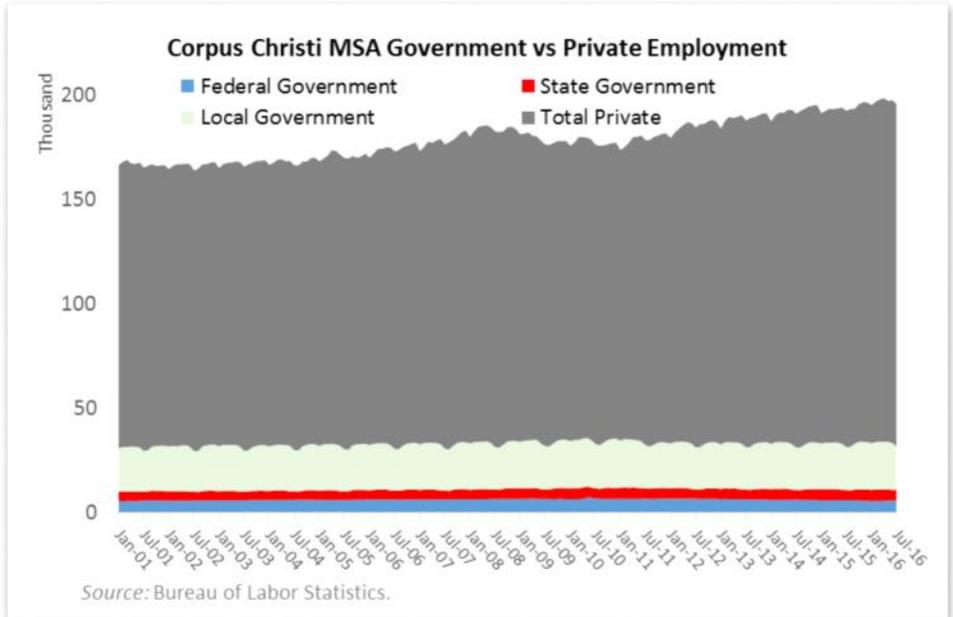
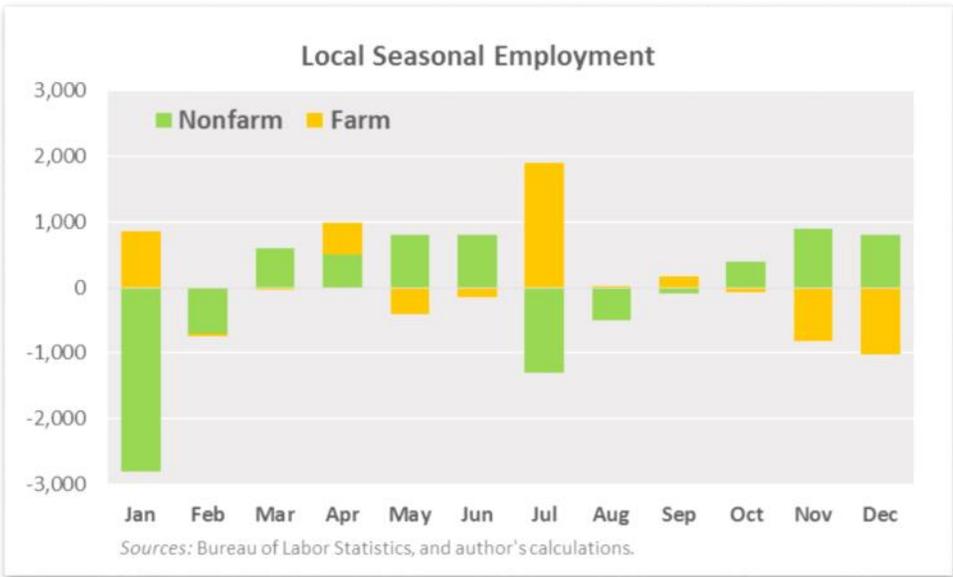
So how much does the agricultural sector account for the observed seasonal patterns in Corpus Christi employment? The column chart on the next page shows a breakdown of seasonal employment between the farm and nonfarm sectors on average for each of the twelve months between 2001 and 2015.

The amounts of seasonal employment are derived from the difference between the official (not seasonally adjusted) data and the seasonally adjusted data using the X-11 method discussed above. The agricultural sector appears to have played a major role in the seasonal variation of employment in the metro area, besides being an urban area as a whole. The month of July marks the peak harvest season for cotton, generating an upsurge of nearly 1,900 farm workers.

That column chart, however, also reveals a considerable seasonal factor in employment within the metro area other than the agricultural sector. In particular, the number of jobs typically falls below the annual average in January and February, and then again in July and August.

The existence of seasonal employment could potentially affect our interpretations of official employment statistics in real time. For example, TWC





time in part because government agencies' hiring decisions are less affected by changes in overall economic conditions than hiring decisions made by businesses. As the plot suggests, this perception about the relative stability of government employment is particularly true for the state and federal governments. By comparison, local government employment exhibits relatively more month-to-month variations.

So how does local government employment change over the year? The column chart below shows the monthly data for each of the four years between 2013 and 2016. Compared to the average for the first half of the year, employment in the local government sector fell about 1,500 positions on average in July and about 1,200 position in August. This regular pattern was attributable to the summer break taken by some of those 2,500 local grade school teachers. The public sector typically recovered most of the jobs lost from those two summer months in the latter part of the year beginning in September.

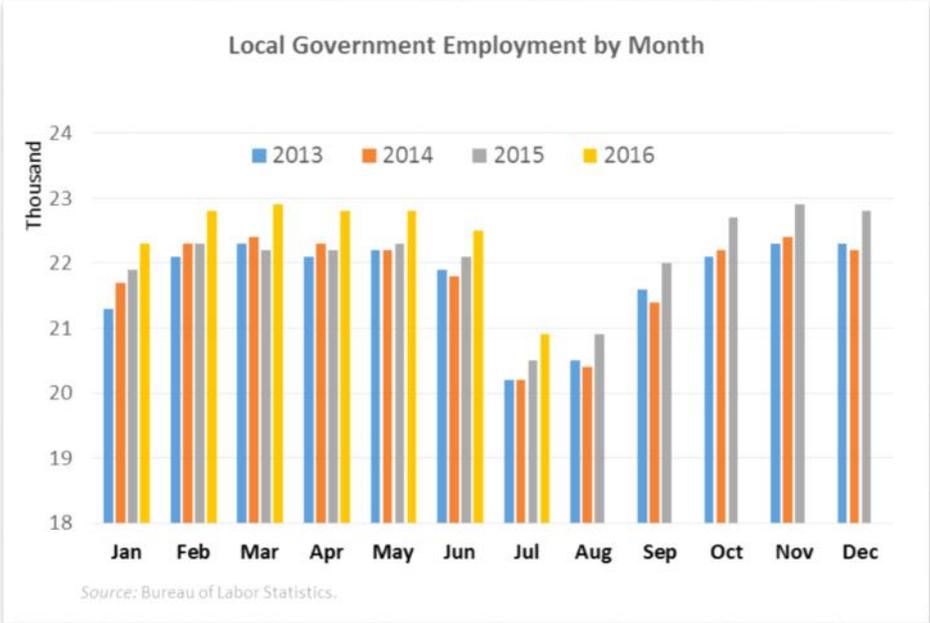
When interpreting changes in Corpus Christi's economic conditions, it is therefore instructive to take such seasonal factors into consideration. Other than applying seasonal adjustment, we can measure year-over-year changes in economic statistics, meaning that we look at the reading of a given month relative to the reading of the same month in the previous year.

has reported that Corpus Christi's total nonfarm employment in last July fell by 1,700, or nearly 1 percent. Without the consideration of seasonal changes in employment, the reduction in nonfarm employment would have signaled a substantial deterioration of the Corpus Christi economy.

That was in fact not the case though. The Commission also reported that rather than the private sector, the government sector cut 1,600 jobs in July, which accounted for almost 95 percent of the job losses in the metro area.

Private versus Government Sectors
The above area chart compares the patterns of private employment with those of the different government divisions since 2001. According to the con-

ventional wisdom, government employment tends to be more stable over





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