Since oil prices collapsed in late 2014, the upstream oil and gas industry has shed over 3,000 jobs locally, more than the total amount added during the shale oil boom between 2010 and 2014. Yet Corpus Christi has sustained a relatively modest downturn in employment due to a variety of factors, including industry-wide and nationwide growth, and self-employment across different sectors, particularly professional and business services.

How did such a gradual rise of the oil and gas industry and subsequently a dramatic fall of that industry affect Corpus Christi?

**Oil Impacts**

One popular method to estimate the impact of a change in one industry on the rest of the regional economy is to apply so-called input-output modeling analysis. Between 2010 and 2014, Corpus Christi gained a total of 2,934 jobs in oil and gas extraction and support activities.

According to an input-output model called IMPLAN, such gains in the oil and gas industry would generate a total of 1,708 more jobs across other industries within the metro area. This ripple, or multiplier, effect essentially means that every 100 additional oil and gas jobs contributed another 58 jobs in the region.

The first bar chart shows the breakdown of regional job impacts by industry. Obviously, the mining sector, with about 92 percent of its employment in oil and gas extraction and support activities, added...
ed the most jobs due to growth in oil and gas production. Other industries that were impacted the most are lodging and restaurants (246 jobs), health care (242 jobs), and retail trade (203 jobs).

However, during that 2010-14 period, the majority of local industries in fact added more jobs than those forecasts based solely on oil and gas developments. The green portion of each bar represents the amount of jobs not explained by the growth in the oil and gas industry. In addition to the relatively large impact of oil and gas on the hospitality sector (accommodation and food services), this sector added nearly 4,000 jobs during that period. Similarly, the construction sector added a total of 2,658 jobs. The shale oil boom contributed only 3 percent of the actual employment expansion. These two sectors benefited largely from the industrial capital developments around the Port of Corpus Christi.

Oil Bust
In early 2015, oil and gas drilling and production slowed down dramatically. By the end of 2016, the local upstream oil and gas industry had lost as many jobs as it added during the last boom period. The IMPLAN model predicts a total reduction of 4,917 jobs, or 2.5 percent of total employment, within the metro area as a result of the actual loss of 3,111 oil and gas jobs.

The estimated employment impacts of the falling oil and gas industry on the Corpus Christi metro area total 4,917 jobs. This number equals the sum of impact estimates across all local industries. Instead, the area actually lost a total of 3,008 jobs over that two-year period. In health care, rather than losing 256 jobs due to the falling oil and gas industry, that sector added 851 jobs.

Likewise, the professional service sector created 836 more jobs versus an estimated oil and gas impact of losing 145 jobs, and the hospitality sector added 730 jobs versus the estimate of 262 fewer jobs. In other words, exceptionally strong growth in the professional services, health care, and hospitality industries have outstripped the adverse impacts of the falling oil and gas industry on those industries.

The difference between the actual change in industry employment and the expected employment change due to the change in oil and gas employment reflects other developments that have also affected the local economy (the green portions of the bar charts). The sum of those “other” components across all industries equals a gain of 1,909 jobs.

Isolating Effects
What contributed to the strengths of the local labor market? We address this question using industry shift-share analysis. Shift-share analysis is a tool that isolates historical employment changes of specific industries into three separate factors: industry-specific developments, national-level trends, and factors unique to this region.

The first two factors are simply estimated local employment changes in line with the respective industry-wide and nationwide employment changes, and the regional factor is the difference between the actual local employment change and the total of former two employment changes.

The above two bar charts show the estimated employment changes in the shift-share analysis for the respective 2010-14 and 2014-16 periods. During the oil boom period of 2010-14, each of those three factors contributed to growth in the majority of industries. Along with the government, the health care and administrative support sectors lost jobs due to factors specific to the South Texas region, whereas employment in those industries nationwide as well as in the whole U.S. economy expanded during that period.

Since oil prices collapsed after mid-2014, regional factors have appeared to play a greater role in the local labor market. The following bar chart shows the results of applying the same shift-share analysis to changes in employment by sector between 2014 and 2016. Nationwide, employment grew a total of 2.9 percent over that period. For each industry, the national effect simply represents a 2.9 percent growth rate.

The estimates for industry-specific effects reflect the growth rates of the individual industries in the nation less the growth rate of the overall national econo-
my (national effects). Except the mining, government, manufacturing and trade sectors, the majority of sectors experienced industry-specific growth. Much of the relatively rapid employment growth in the health care, and accommodation and food services sectors was associated with both industry-wide and national growth.

**Regional Factors**

The last component (in red) of each bar in the chart represents the employment change related to factors unique to this region. The estimates equal the differences between the actual employment changes of specific sectors and the sum of the nationwide and industry-wide effects.

For the mining sector, in particular, the sum of industry and regional effects equals a reduction of 3,330 jobs, close to a loss of 3,129 jobs derived from the IMPLAN model.

For the local economy as a whole, estimates of the regional effects across all sectors total a net loss of 7,660 jobs. The falling oil and gas industry alone accounts for about 65 percent of those lost jobs.

The regional effects are negative for most sectors, including hospitality and health care that added jobs in that period. The exceptions are the utilities, professional services, and management sectors, which experienced positive regional effects, in addition to growth in line with their own industries and the nation as a whole.

**Shadow Economy**

In addition to growth tied to the overall U.S. economic conditions and specific industry trends, self-employment has also served as a stabilizing factor for the local economy.

The following column chart shows the annual percentage change of Corpus Christi’s employment beginning 2002. In addition to the pattern of the number of employed (yellow columns), this chart shows the corresponding pattern of the sum between the number of employed and the number of self-employed individuals (blue columns).

By comparison, the latter is consistently smaller in its absolute size than the former. In other words, employment changes over time are more stable if self-employment is taken into consideration. During an economic downturn, for instance, some unemployed individuals might have become self-employed or decided to run their own businesses.

In Corpus Christi, nearly one in four (23%) self-employed individuals can be found in the construction sector. Other than construction, the services industries account for the vast majority of self-employment in the area.

Self-employment is more common in certain industries. In the farming sector, nearly 30 percent of workers are self-employed instead of being hired by others. The construction sector not only accounts for the most self-employed, those workers also make up nearly 15 percent of the total workforce in that sector. Similarly, the proportion of self-employed individuals is remarkably large among services industries, especially recreation.

**Small Firms**

Other than disparities across industries, employment dynamics vary among firms in the same industry. The following chart shows the percent change of employment by firm size since 2014. For a variety of reasons, medium-size firms with a payroll between 10 and 99 employees added jobs despite an overall downturn in the local economy. Together those businesses make up about 85 percent of all firms in Corpus Christi. Meanwhile, firms in other size classes collectively lost jobs.

Disregarding the smallest (1 – 9 employees) and the largest (500+ employees) size classes, then it is clear that local hiring tended to deteriorate for larger firms. This observation underscores the stabilizing role of relatively small businesses, particularly in professional and management services.
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