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Do changes in oil prices affect welfare programs? Evidence from Kern County

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ABSTRACT

In this paper, the intertemporal causal relationship between oil prices and welfare programs in Kern County is studied using monthly data between 1999:7 and 2016:8. Results from the autoregressive distributed lag (ARDL)-bounds testing approach show that there is stable long run equilibrium relationship between CalFresh caseloads, oil prices and unemployment. They also show that adjustment in CalFresh participation due to changes in oil prices and unemployment is slow, and a 10% increase in unemployment led to a 3.3% increase in CalFresh enrollment. Results from a modified Granger Causality method indicated causality running from unemployment to CalWORKs, and no causality from oil prices to CalWORKs participation. The GIRF confirmed that CalWORKs is more responsive to changes in unemployment than to oil price shocks. The FEVDC results demonstrated that contributions of the oil price shocks in explaining variations in CalWORKs were negligible.

1. Introduction

Protracted oil-price decreases are generally accompanied by economic regression, and may have far reaching consequences on the economy. Analytically, a host of studies have shown that changes in oil prices affect unemployment (Rasche and Tatom, 1981; Hamilton, 1983; Kim and Loungani, 1992; Rotemberg and Woodford, 1996; Davis and Haltiwanger, 2001). Marchand (2012) noted that for every 10 energy extraction jobs created during a boom period, three construction jobs, two retail jobs, and 4.5 service jobs were also created, while Weber (2014) found that each mining job created during a boom period led to creation of 1.4 non-mining jobs. Black et al. (2005) noted that one mining job created during the boom period generated a total of 0.174 local sector jobs. However, during the bust period, there were significant negative spillovers over the whole economy, likely increasing unemployment dramatically. Black et al. (2005) noted that one mining job lost during the bust destroyed 0.349 local sector jobs, a much bigger loss than the employment gains during the boom period. This implies that job losses experienced in the oil industry due to low prices, have far reaching consequences in the labor market, where the unemployment rate in other sectors could be much bigger than that in the oil industry alone. These changes have consequences on welfare programs, which provide a safety net for the unemployed or those with low income.

Low oil prices may increase enrollment in welfare programs either directly or indirectly, through increased poverty and unemployment resulting from prolonged decreases in oil prices. Although there have been a number of studies looking into oil prices and labor markets, there have been very few attempts to determine the relationship between oil prices and welfare programs. This question appears to be of primary importance to policy. For example, if oil prices were to move together with welfare programs' caseloads, then regions employing a large percentage of workers in oil related industries ought to formulate policy that would dampen the adverse effects of reduced oil prices resulting from exacerbated enrollment in welfare programs. In this paper, I take advantage of this paucity and study the oil price–welfare nexus in a region where a large population works in energy related industries. The objective of the study is to analyze the relationship between oil prices, unemployment and participation in CalFresh and CalWORKs in Kern County California (CA). CalFresh is California's version of the SNAP program (Supplemental Nutrition Assistance Program, formerly food stamp), while CalWORKs is the states' version of the TANF program. The TANF program (Temporary Assistance for Needy Families) is designed to provide aid to needy families. Results will reveal whether oil prices do move together with welfare programs, and if so, how long it takes for welfare programs to "shake off" shocks from changing oil prices.

The rest of the paper is organized as follows. Section 2 discusses the oil price welfare relationship while Section 3 covers the estimation techniques and empirical analysis. Section 4 concludes the study.

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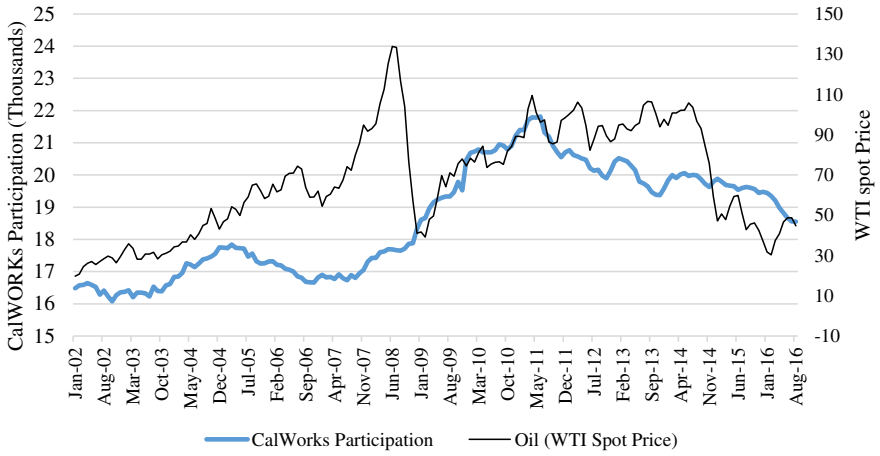

Fig. 1. CalWORKs participation and oil prices in Kern County.

2. Oil prices and welfare programs

This paper will study the relationship between oil prices and two welfare programs in Kern County, CalFresh and CalWORKs. CalFresh, also known as the California Food Assistance Program (CFAP), is a welfare program which offers nutrition assistance to eligible low income individuals and households. Benefits are issued monthly, with food purchased at markets and food stores using an Electronic Benefit Transfer (EBT) card. Federally, the program is referred to as the Supplemental Nutrition Assistance Program (SNAP) (California Department of Social Services, 2016a). CalWORKs is a welfare program that gives cash aid and services to eligible California families in need. Those eligible to receive help are families with little or no cash needing food, housing, or clothing. Recipients receive money each month to pay for the services (California Department of Social Services, 2016b).

Kern County is California's top oil producing county. In 2015, it possessed 78% of the wells in the state and produced 72% of the oil (California Department of Conservation, 2015). Roughly 7% of employees in the county work in oil related industries making employment sensitive to changes in oil prices (Holsonbake and Evans, 2012). Despite this abundance in oil, the poverty rate is substantially higher than other counties in the state. The U.S. Census Bureau (2017) reports that roughly 23% of people in Kern County live below the poverty level, the sixth highest in the state. These unique characteristics make an interesting case for testing the effects of changes in oil prices on CalFresh and CalWORKs in a county whose economy relies on oil.

In June 2016, there were 470,121 cases receiving cash grants in California and 18,666 in Kern County. Los Angeles County had the most recipients at 147,755 while Alpine County only reported 2 cases. In August 2016, there were 2,089,008 CalFresh recipients in California, where as 70,997, or 3.4%, were from Kern County. Again, Los Angeles County had the most participants at 555,559. The movements between oil prices and welfare programs are illustrated in Figs. (1) and (2).

The period between December 2004 and September 2006 show that CalWORKs participation declined when oil prices increased. The two series increase concomitantly between January 2009 and May 2011 then diverge between May 2011 and November 2014. The spread widens between February 2013 and November 2014. Recently, oil prices and CalWORKs participation have been declining. This decrease in caseloads may be taking place due to improved economic conditions despite the low oil prices.

Fig. 2 illustrates that CalFresh participation has been on an upward trend since September 2000, despite swings in oil prices. Table 1 illustrates the average rate of growth, 12 months before, 12 months during, and 12 months after a significant oil price decline. Two periods are assessed in this analysis.

Between June 2008 and July 2009, oil prices dropped by $64.24 or 47.98%, during which the rate of growth in CalFresh and CalWORKs participation increased. The year before oil prices declined (May 2007–May 2008), growth in CalFresh participation grew at an average of 1.03% before increasing at an average rate of 1.69% between June 2008 and June 2009 as oil prices declined. Subsequently, CalFresh participation growth rate increased at a slower rate between July 2009 and July 2010. A similar scenario was observed in CalWORKs participation with the growth rate increasing at an average of 0.67% during the oil price decline and uptake slowing down following the slump. During the second oil price decline which began in June 2014, participation in the CalFresh program increased while participation in CalWORKs declined. The rate of CalFresh participation increased during the oil price decline at an average rate of 0.73%.

The periods before and after experienced a growth rate of 0.24% and 0.36% respectively. Surprisingly, CalWORKs participation declined during that period. Even more, the rate at which it declined increased during the slump in oil prices. It is important to note that the first period was a recession period which implies that there was a significant decline in economic activity which suppressed employment in other areas. Overall, changes in oil prices exacerbate the rate at which participation is increasing or decreasing in welfare programs. Secondly, the CalFresh participation growth rate in Kern County is more sensitive to changing oil prices than CalWORKs. Fig. 1 also illustrates that the participation growth rate in CalWORKs has been on a steady decline since May 2011, indicating that it tends to move with the overall economy.

3. Estimation techniques and empirical analysis

3.1. Cointegration – ARDL bounds testing procedure

The autoregressive distributed lag ARDL-bounds testing approach and the error correction method (ECM) are used to examine the long-run cointegration relationship between oil prices, unemployment and two welfare programs – CalFresh and CalWORKs. The ARDL modeling approach was introduced by Pesaran and Shin (1998) and extended by Pesaran et al. (2001). The ARDL cointegration approach has the advantage over other cointegrating methods in that it does not require that all variables be integrated of the same order. The ARDL is also applicable to small sample sizes compared to other cointegration tests which are sensitive to sample size. It can also accommodate a greater number of variables in comparison to other VAR models (Hasan and Nasir, 2009).[1] The ARDL

[1] There's a structural break that occurs over the period between June 2008 to January 2009 inclusive. I constructed a dummy variable that takes the value of one for these observations, and zero everywhere else.