Impact of Oil Booms on Human Capital Investment in Texas

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Motivation

• Energy sector crucial for oil-rich states such as Texas
• Positive oil price shocks tend to benefit Texas
• Long commodity price booms can deter human capital investment
• Important implications for net economic impact of prolonged resource booms
• Previous research focused on macroeconomic effects of oil price shocks
Oil Price Booms and Busts

Source: Federal Reserve Bank of St. Louis FRED.
Potential Labor Market Effects of Prolonged Oil Booms

• Effect on wages
  – Decline in aggregate wages
  – Increase in oil-rich regions

• Effect on skill premium
  – May increase relative demand for unskilled labor
  – Depends on capital/energy complementarity

• Impact of boom on human capital investment
  – Raises opportunity cost of additional schooling
  – Lowers college wage premium
  – May deter human capital investment
This Paper

• Did the oil boom adversely affect human capital investment in Texas and other oil-rich regions?
• Use Census and American Community Survey (ACS) data from 1970 to 2010
• Investigate impact of oil boom and bust on
  – Real wages
  – Skill premium
  – Human capital investment
• Key findings:
  – Oil boom drove up real wages in Texas
  – Small negative impact on college enrollment
Previous Literature

• Coal boom and bust
  – Black, McKinnish, & Sanders (2005)

• Resource booms and human capital
  – Gylfason (2001)

• Oil price shocks and wages/skill premium
  – Negative effect on wages
  – Keane & Prasad (1996): wider skill premium
  – Polgreen & Silos (2009): narrower skill premium

• Oil boom and human capital investment
  – Emery, Ferrer, & Green (2012): Canada
Data

• 1% Census IPUMS for the years 1970, 1980, 1990, 2000, and ACS for 2010

• Sample restricted to employed workers with positive wages and hours.

• Wage=annual wage and salary income/annual hours worked

• Annual hours worked =weeks worked last year X hours worked per week

• Oil Area defined as county groups with >2% employment in oil and gas sector,
  – Non-oil area <0.5%.
Worker Shares by Educational Attainment: Oil & Gas Vs. Non Oil/Gas
Worker Shares by Educational Attainment: Texas vs. USA

- U.S. minus Texas (College +)
- Texas (College +)
- Texas (Less Than HS)
- USA minus Texas (Less Than HS)
Percent Change in Worker Share by Educational Attainment (1970-1980)

- Less than HS: -40.0, U.S minus Texas: -40.0, Texas: -37.2
- HS: 8.9, U.S minus Texas: 19.6, Texas: 44.7
- Some College: 44.7, U.S minus Texas: 40.9, Texas: 45.2
- College +: 45.2, U.S minus Texas: 32.8, Texas: 32.8
Percent Change in Mean Real Hourly Wages (Texas vs. Rest of U.S.)

Source: 1% Census IPUMS obtained from Minnesota Population Center; Author's calculations.
Synthetic Cohort Approach

• Treatment group affected by oil boom
  – Texas-born who turned 17 when oil prices peaking (1978 to 1981)
• Control group unaffected by the oil boom
  – Texas-born who turned 17 during pre-boom (1970 to 1973)
• Compare education attainment of two groups in 2010
• Net out any differences between the two cohorts born outside Texas
• Remaining difference interpreted as oil boom’s impact
Change in Share with College Education in 2010 (Boom Cohort minus Pre-Boom Cohort)

Source: 2010 ACS obtained from Minnesota Population Center; Author's calculations.
Conclusion

• Census IPUMS data from 1970 to 2010
• Primary findings
  – Oil boom associated with slower growth in the relative demand for skills
  – Significant impact on real wage growth
  – Insignificant impact on skill premium
  – Texas-born boom cohort less likely to have college education
    • 1 percentage point less likely to have a college degree
    • 2 percentage less likely to have any college
• Case for increased subsidies to higher education in oil-rich regions
Percent Change in Share with College Education in 2010 (Boom Cohort minus Pre-Boom Cohort)

Source: 2010 ACS obtained from Minnesota Population Center; Author's calculations.