Trade Competition and Internal Migration: The Partial Ability of Technological Advancement in Fracking to Absorb Job Losses

Team 3
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Abstract

In recent years, the United States has experienced dramatic increases in its imports, both in absolute and relative terms, from nations not traditionally considered economic powerhouses, notably China. The papers provided to us in the prompt emphasized that this increase in trade has disproportionately affected young, uneducated men. The secular decline in labor intensive American manufacturing created a large class of unemployed, uneducated men that, as their situations grow increasingly more severe, should theoretically be incentivized to migrate increasing distances. Concurrent with the decline in labor intensive manufacturing has been the rise in the fracking boom; we hypothesize that the laborers displaced by trade were partially absorbed by the fracking boom. Moreover, we hypothesize that the regions most severely affected by trade pressures will demonstrate the strongest population outflows and the regions with the largest growth in natural resource production will demonstrate the largest inflows. We find that the former correlation (import pressure and outflows) is strong and robust to specification while the latter (inflow and growth in natural resource production) is weak and hardly present.
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1 Introduction

With the rise of sensationalist media coverage in the past decade, many Americans have been led to believe that increased trade competition will single handedly lead to a collapse in the U.S. Labor market. The mania around this subject has grown to the extent that the entire political field rotated to address the supposedly frightening trade deficit.

Despite this media mania, economists remain unconvinced, and analysis has shown that the “trade war” of the recent past has its own set of benefits for the U.S. economy. Hoping to better understand the truth behind this controversial topic, this paper extends the thread spun by these economists, analyzing the positive effects of increased trade competition on the fracking industry. To do so, we track labor influx to fracking-dominated regions from regions most affected by trade competition, thus allowing us to understand the impact on this industry from foreign trade.

2 Literature Review

In light of the monumental growth of the Chinese economy and its flourishing manufacturing sector, much literature has accumulated analyzing the effect of this growth on the US labor field. The granting of the Permanent Normal Trade Relations (PNTR) to China in 2001 provides a particularly useful point of analysis, as this policy change led to massive surge in U.S. imports of Chinese goods, thereby allowing researchers to study labor effects and overall welfare effects that arose near this rise in import competition.

In response to this, research has attempted to determine the welfare and labor effects from this trade competition. While some literature finds little migration in response to this competition, (Autor, Dorn, and Hanson (2013)), further research determines that markets most exposed to this trade competition experience reduced overall population growth, implying a subsequent decrease in participation in labor markets, (Greenland, Lopresti, McHenry (2019)). The theory and empirical analysis in this paper contributes to this effort, studying what migration does happen, generally out of the hardest hit areas by trade competition to areas that provide similar kinds of work (specifically in this case, work in the fracking industry and supporting industries).

The theoretical background in this paper and in the papers mentioned above are further justified by examination of the welfare effects from this newfound trade competition, as research investigates the change in wages and employment rates (Caliendo, Dvorkin, and

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2http://time.com/4386335/donald-trump-trade-speech-transcript/
Finally, this paper contributes to rising literature surrounding the recent fracking boom and the source of employment that fueled this growth. We find in Wilson (2017) that migrants to areas that have significant investment in fracking are largely “male, unmarried, young, and less educated,” though the paper also recognizes that much of the response in the labor force may have been resolved not just by moving but by commuting from nearby counties. We also find in Cascio, Narayan (2019) that the fracking industry affects the downward trend in local drop out rates in schools for boys, showing a response in the population of uneducated males that respond to the increased labor opportunities for their kind of labor in their area.

3 Data

3.1 Data Background

Our research requires comparison of trade-competition and increased onshore oil and natural gas production data with migration data by commuting zone (CZ).

To begin our data analysis, we recovered county-level data for the contiguous 48 states of the U.S., looking at migration flow from each county to every other county. We then collapsed this set into previously defined Commuting-Zones (CZ’s) by aggregating the data on inflows and outflows per county and summing the counties that made up each CZ. So we had the migration flows of each CZ to and from the rest of the country. Here, CZ’s are a concept brought about by Tolbert and Sizer (1996) as approximations of local labor markets, manufactured through journey-to-work data. To establish an understanding of the relationship between import-competition and CZ’s, we then used data provided by Autor, Dorn, and Hanson (2013) to rank these zones by the impact felt by trade activity. Combining this data with migration information on each CV, we could then begin to measure what impact these migrations (and therefore import-competition) had on a selected variable.

With the relation between CZs and import-competition established, we then collected county-level data for Oil and Natural Gas production, collapsing this to CZs once again. Thus, we were able to get the amount of petrochemical production, and petrochemical production growth, at the CZ level.
4 Theoretical Backing for Empirical Approach

4.1 Background Framework

Due to an increasingly large and mobile population, we would a-priori expect to see gross inflows and outflows of people among all commuting zones increase over time. Similarly, we expect natural gas production to increase over time; to avoid capturing this spurious correlation, we took a cross sectional approach. We are interesting in analyzing: do commuting zones that saw increases in immigration outflow from $t = -1$ to $t = 0$, that zone will see population outflow from $t = 0$ to $t = 1$. Similarly, we hypothesize that regions that saw rapid increases in natural resource production from $t = -1$ to $t = 0$ will see population inflows from $t = 0$ to $t = 1$. Here, $t = -1$ to $t = 0$ corresponds to 2000-2010 era and $t = 0$ to $t = 1$ corresponds to 2010 through 2015, which allows us to capture the fracking boom (and reinforces our thesis that the fracking boom helped absorbs the young men displaced from trade).

5 Empirical Results and Conclusion

After this lagged cross sectional analysis, we are confident in one aspect of our hypothesis: more aggressive trade pressures cause people to migrate at a higher rate. However, we are not confident that a rapidly growing natural gas sector will attract people at the rate we had expected. We find it important to note that, when comparing trends, a more rapid natural gas sector did coincide with increases in population inflows; however, regressing differences on differences failed to show the relation between the trends we had hoped for. In further analysis, we would like to pursue a more data rich approach that explores whether people that left areas as a result of trade pressure did in fact go to regions rich in natural resource production. Specifically, we would like to regress outflows to regions with productive fracking sectors on import pressure rather than the more general outflows from that region. However, we are satisfied with our identification that agreed with existing literature in showing that increased trade pressures in one period predicts population outflows in the next, even if we did not, to our satisfaction, show that trade causally causes this migration to fracking areas.
6 Appendix

Regression of Exposure to Out-Migration

Regression of Oil Production to In-Migration

Regression of Natural Gas Production to In-Migration
Table 1: Analyzing Inflows/Outflows related to Import Pressures/NR_Production

<table>
<thead>
<tr>
<th></th>
<th>(1) Outflow on Trade Exposure</th>
<th>(2) Inflow on Gas Prod.</th>
<th>(3) Net Inflows on Exposure, Oil Prod.</th>
</tr>
</thead>
<tbody>
<tr>
<td>log_exposure</td>
<td>0.564***</td>
<td></td>
<td>0.430***</td>
</tr>
<tr>
<td></td>
<td>(0.0426)</td>
<td></td>
<td>(0.0623)</td>
</tr>
<tr>
<td>log_oil</td>
<td></td>
<td>-0.0853*</td>
<td>0.0231</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0351)</td>
<td>(0.0421)</td>
</tr>
<tr>
<td>_cons</td>
<td>10.27***</td>
<td>12.15***</td>
<td>8.217***</td>
</tr>
<tr>
<td></td>
<td>(0.0629)</td>
<td>(0.512)</td>
<td>(0.615)</td>
</tr>
<tr>
<td>N</td>
<td>716</td>
<td>572</td>
<td>457</td>
</tr>
<tr>
<td>adj. $R^2$</td>
<td>0.196</td>
<td>0.009</td>
<td>0.091</td>
</tr>
</tbody>
</table>

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

7 Bibliography

References


[7] Wilson, Riley. Moving to Economic Opportunity: The Migration Response to the Fracking Boom University of Maryland, Department of Economics, 3114 Tydings Hall, College Park MD.