Coal in America: Chronicling and Analyzing Its Economic and Social History

Duke UNIVERSITY | BASS CONNECTIONS

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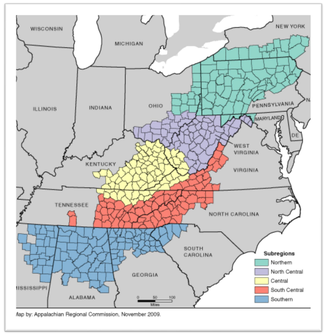
Bass Connections in Energy & Environment

Background

Objective

The objective of the 2018-2019 Coal & America Bass Connections Team is to understand how different **social** and **economic** factors influence coal employment, production, and communities in Central Appalachia



Approaches

- Collection of oral histories from the region
  - Provide context for economic data
  - Plan to create an online archive of oral histories for future researchers
- Data Collection
  - Digitized Bureau of Mines Mineral Yearbooks with data on production and employment of bituminous mines at county level from 1948-1962
  - Ran economic decompositions on findings
- Final Report will synthesize findings

Oral Histories

Interviews

- 26 total interviews were conducted over 4 trips to Eastern Kentucky as part of Story+ through the John Hope Franklin Humanities Institute and Bass Connections
- Plans are in place to publish transcripts and interviews in an archive on the team's website

Themes

Mechanization & Decline in Employment:
"Now we have 500... less than 600 people. And that trend started in the late 50s, 1960s, with the introduction of the bigger, faster, more efficient productive coal mining machines, which required a less number of individuals on the payroll. So there was a huge layoff in 1960 with that."
- Mike O'Bradovich

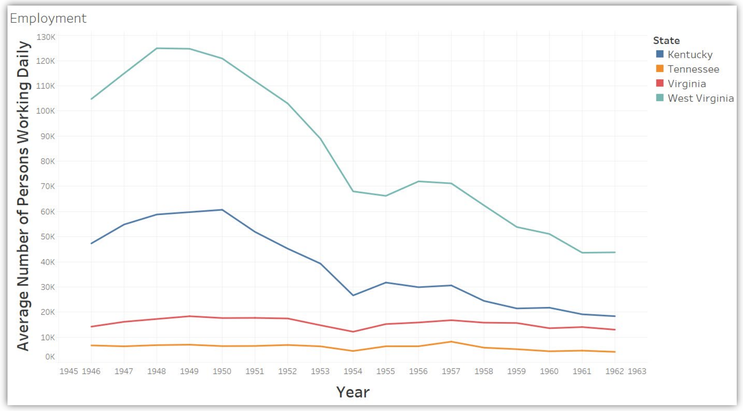
Effects of Black Lung:
"See, your legs is the first thing [that] suffers from black lung. See, I can sit on up, ride my lawnmower or tractor and do okay, but then when I start walking, especially up a hill, it just takes too much oxygen."
- Bethel Brock

Migration Follows Booms and Busts in Employment:
"And then the mine shut down, that's when he had to go to Chicago. I believe it was '60, and we stayed up there till '64. Then when the mines picked up, he come back down here. And started back in the mines, and that's where he finished his life out, back in the mines"
- William McCool

Diversity in Communities:
"When I first come here [to Lynch, KY from Alabama], it was about 12,000 people here. About 4,000 of them were black. Maybe another four or 5,000 were white American. And then there was four or 5,000 Hungarians and [Polish]. And all this diverse communities, different nationalities, different eating styles, and all that stuff."
- Gean Austin

One Question

Why did coal employment in Appalachia decline from 1946 to 1962?



Methodology

Data Collection

- Compiled production and employment data from every county in Central Appalachia from 1946 to 1962
- Navigated data that was in an inconsistent, image-based format
- Entered over 30,000 cells of data and validated entire data set using double-entry
- Provided a quantitative complement to our descriptive qualitative research
- Guided in-depth analysis on specific industry trends and time periods

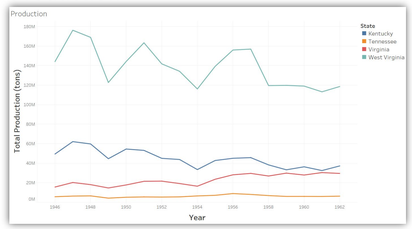
Literature Review

- Investigated dozens of primary and secondary resources to explore possible causal factors driving declines in employment
- Worked to synthesize literature with descriptive analysis of data

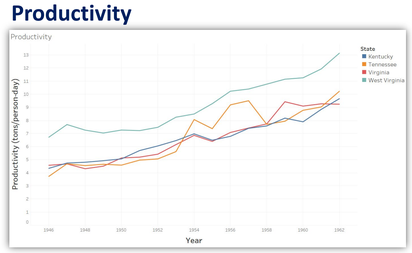
Economic Analysis

- Performed economic decomposition and regression analyses to better understand which factors contributed to productivity
- Used descriptive analysis to contextualize trends and explore relationships between variables.

Production



Productivity



Conclusions

Reduced demand

- Coal lost markets to oil and natural gas during the 1950s. In 1946, coal supplied just over 15 quadrillion Btus of energy, approximately 50% of U.S. energy consumption. In 1962, it supplied 9 quadrillion Btus, approximately 20% of U.S. consumption.
- Demand from the transportation sector declined significantly. In 1949, transportation (primarily railroads) consumed 70.2 million short tons of coal. But railroads replaced coal-fired steam engines with diesel locomotives during the '50s. In 1962, transportation consumed 687 thousand short tons—a 98% reduction.

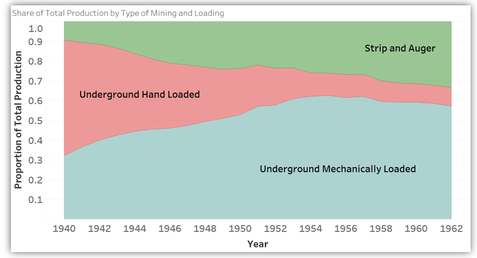
Increased mechanization

- We project that automation contributed to the disappearance of an additional 57,707 jobs compared to if productivity had remained constant from 1946-1962.
- Automation of underground mining methods was the most significant contributor to increased productivity. Operators' growing reliance on more productive surface methods also played a role.

Possible exercise of market power

- The Tennessee Valley Authority's historically large, long-term contracts and aggressive vertical integration of strip-mining likely kept prices low and forced unionized, underground mines to forfeit market share.

Share of total production by type of mining and loading



Labor Intensity Decomposition (person-days/ton)

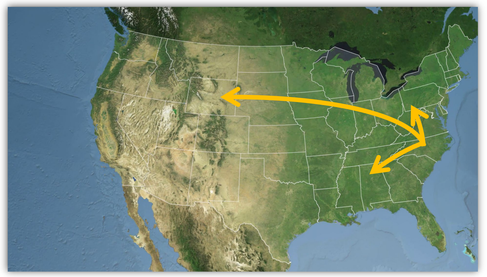
	Principal Effect (TP)	Structure Effect (ES)	Change in Labor Intensity (1946-1962)
Strip	-0.0037	-0.0040	-0.0309
Underground	-0.0903	-0.0005	-0.1027
Overall			-0.0986

- TP denotes an overall decrease in labor intensity signaling that less labor is required for equivalent amounts of production
- ES denotes a general shift from high-labor intensity technology towards low-labor intensity technology

Looking Forward

Future team members will work to:

- Expand data entry and validation to other parts of the United States
- Broaden the scope of our analysis to include additional time periods
- Collect oral histories from other parts of the United States
- Publish the Coal & America website



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