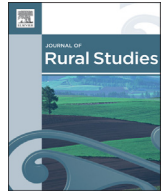




Contents lists available at ScienceDirect

Journal of Rural Studies

journal homepage: www.elsevier.com/locate/jrurstud

Coal and family through the boom and bust: A look at the coal Industry's impact on marriage and divorce[☆]

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ARTICLE INFO

Article history:

Received 22 November 2016

Received in revised form

31 August 2017

Accepted 18 September 2017

Available online 12 October 2017

ABSTRACT

Rural America has a long relationship with the coal industry. Long-term shifts toward less labor intensive practices in the industry, coupled with policies aimed at reducing carbon emissions have resulted in substantial employment losses in coal communities. While the economic impacts of declining industries in rural America have been documented, less work has been done to investigate the impact of coal employment losses on social outcomes. We address this gap in the literature by assessing the association between county-level measures of coal employment and marriage, divorce, and cohabitation in nonmetro America. We use a novel proprietary data set to isolate the relationship between marital outcome and coal mining from all other types of mining that aggregated in publicly available data sets. Additionally, we compare these relationships across boom and bust periods. We find that after controlling for total employment growth, the presence of coal mining in a county is significantly associated with marital outcomes and these relationships differ across nonmetro and metro areas. We find some evidence that rural areas that typically have more experience with extraction industries display greater resilience to both positive and negative coal industry shocks compared to metropolitan counties.

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1. Introduction

The coal industry has long held a prominent place in rural America. For over a hundred years, coal has been the main fuel source for electricity generation in the United States (US EIA, 2011). A long line of research has sought to uncover the short- and long-term effects of natural resource extraction on the communities in which it occurs (Betz et al., 2015; Partridge et al., 2013; Deaton and Niman, 2012; Douglas and Walker, 2012; Bell and York, 2010; Rosser, 2006; Black et al., 2005; Freudenburg, 1992). Extraction industries are different from other industries in several respects, and thus may have unique impacts on communities. Because many

natural resources, like coal, take hundreds of millions of years to form, the industry must locate in places where it already exists. This means coal communities potentially have leverage to set the terms under which extraction occurs, which might suggest the presence of coal within a community would have positive economic and social impacts. However, in practice, many studies have shown that natural resource abundance can distort positive economic and social forces and leave communities worse off in the long run, a phenomenon referred to as the “natural resource curse” (Auty, 1997; Sachs and Warner, 2001; Van der Ploeg, 2011; Deaton and Niman, 2012).

While there have been several recent investigations into the economic impacts of natural resource development in the United States (Lobao et al., 2016; Betz et al., 2015; Marchand, 2012; Deaton and Niman, 2012; James and Aadland, 2011), less work has been done on the coal industry's social impacts, very few have examined implications for marriage, and those that have are qualitative in nature and have examined a single specific context (Duff, 2004). Our study is the first to estimate quantitative associations between coal mining and marriage outcomes for all counties in the United States. This work is particularly germane given the Trump administration's current efforts to revitalize the coal industry in the United States.

[☆] This study was partially supported by the Appalachian Research Initiative for Environmental Science (ARIES). ARIES is an industrial affiliates program at Virginia Tech, supported by members that include companies in the energy sector. The research under ARIES is conducted by independent researchers in accordance with the policies on scientific integrity of their institutions. The views, opinions and recommendations expressed herein are solely those of the authors and do not imply any endorsement by ARIES employees, other ARIES-affiliated researchers or industrial members. This study has not been read or reviewed by ARIES officials. Information about ARIES can be found at <http://www.energy.vt.edu/ARIES>.

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The presence of coal mining within a community may influence marital outcomes through several channels. First, the coal industry offers better paying jobs than would be otherwise be available to rural residents, especially for low-skill or less-educated workers (Krueger and Summers, 1988). This may improve economic outcomes within the community, which have long been linked to marriage behavior (Amato and Beattie, 2011; Cherlin et al., 2013; Cohen, 2014; Hellerstein and Morrill, 2011; Schaller, 2013). Second, the coal industry may generate certain cultural and social norms within a community (Bell and York, 2010), which may in turn affect marriage outcomes (Afifi et al., 2013). Many mining communities are more isolated and have lower entrepreneurial activity than other rural areas (Betz et al., 2015). Such areas may not have survived without the jobs the coal industry provides. Because these places are often remote (Cook and Mizer, 1994), they may have stronger community ties, which could strengthen commitment to the institution of marriage within the community (Sampson et al., 1997). Divorce and cohabitation may then also be less socially acceptable in mining communities because they may be seen as threatening to the community's social cohesion (Putnam, 1995).

We empirically test for these associations and determine the net relationship between coal mining employment and county marriage, divorce, and cohabitation rates. Additionally, the relationship between coal mining and marriage outcomes may vary according to the degree to which the mining industry is thriving. If mining exists in places with less industry diversity and fewer employment alternatives, the coal industry's boom and bust cycle may more heavily influence marriage behaviors. To test this hypothesis, we investigate the associations between coal mining on marital outcomes over both recent boom and bust periods.

Of particular interest to our study is how the boom and bust cycle of natural resource extraction relates to marriage behavior. The coal industry is subject to boom and bust cycles typical of commodity markets. Such cycles produce much greater employment and wage volatility across local labor markets in places more heavily dependent on coal mining compared to places with a mix of industries that are less commodity dependent (Cavalcanti et al., 2015; Van der Ploeg and Poelhekke, 2009; Brown et al., 2008). These sharper employment and wage fluctuations likely affect marriage behavior differently than more gradual changes characteristic of most other industries. Boom/bust cycles impact not only those working directly in the coal industry, but those outside of the industry who work in jobs that either support mining work or for local proprietors that depend on selling goods and services to those living in mining communities. Black et al. (2005) found that for every coal job gained during the coal boom of the late 1970s, two local sector jobs were created; but during the bust of the early 1980s, 3.5 local sector jobs were lost for every coal jobs lost. This suggests more jobs were lost during the bust than gained from the boom. Because economic conditions weigh so heavily on marital decisions, such sharp local employment responses to boom bust behavior likely also affect long-term relationship decisions of those living in coal communities.

One question that arises is do residents of coal communities accurately assess the local economic impact of a bust differently than a boom. The answer is not clear *a priori*. Booms (busts) may have positive (negative) psychological effects beyond those stemming from local economic conditions. Previous research has found that stressful life events, perceived as either positive or negative, can affect marital behaviors in different contexts (Boss, 2014; Conger, 2011; Conger et al., 2002; Kwon et al., 2003). If booms or busts have psychological effects on residents, there very well may be differences between marriage patterns between strong and weak periods for the coal industry. Alternatively, places engaged

more heavily in coal mining may have a longer history with boom/bust cycles and thus may be less affected by any sharp changes in local economic conditions because the community anticipates them and is better prepared for such fluctuations. If this is the case, then marriage behavior may differ little across the boom and bust periods. We empirically test for these possibilities by examining the low coal-price "bust" decade of the 1990s with the high coal-price "boom" period of 2000–2010 and look for differences across metropolitan (metro) and nonmetropolitan (nonmetro) contexts.

We draw from two existing literature streams: 1) the effects of boom and bust cycles on the well-being of people and communities in resource extraction counties, and 2) trends in family behavior in the U.S. with an emphasis on families living in rural areas. Conceptually situated at the intersection of these two areas, this study answers new research questions not previously asked in either literature. We use proprietary employment data that allows us to distinguish coal mining from all other types of mining employment, which is aggregated in publically available employment data. Our findings shed new light on our understanding of how economic and cultural forces shape family behaviors and help us better understand what motivates unique patterns of rural family behaviors, filling a gap in the literature. We find that the level of coal employment within a county is associated with higher marriage rates and lower divorce and cohabitation rates in nonmetro areas when coal prices are booming, but has little association during a bust period. Surprisingly, we find that coal mining employment is also associated with marital outcomes in metro areas, despite their typically higher industry diversity and lower economic dependence on the coal industry. These results are particularly germane for rural communities, where most natural resource extraction occurs. Our findings can help to inform policy in a time when climate change policies and shale oil and gas development are radically changing the face of American energy development and thus the prospects of those living in the mostly rural natural resource extraction communities.

The rest of the paper is organized as follows. We first describe the boom and bust cycle associated with natural resource extraction, followed by a discussion of the relationship between marital outcomes and local economic conditions. We then explain our methods, discuss the empirical results, and end with some conclusions.

2. The boom and bust cycle of natural resource extraction

Coal is an internationally traded commodity that is used across the globe primarily for electricity generation, but also for other commercial uses (U.S. EIA n.d.). As such, the price of coal responds to international market forces. Changes to aggregate global coal supply and demand influences coal prices that producers receive in places like West Virginia and Wyoming. These changes affect local wages and employment in coal producing communities not only in the coal industry, but across all local industries since they compete with mining employers for workers in the same local labor market (Black et al., 2005; Weinstein, 2014). When commodity prices are high during boom phases, people and money flow into extraction communities. When prices fall, flows are in the opposite direction. We are especially interested in the impacts of these boom and bust cycles on family behaviors of people living in resource extraction communities over the short and long term, but no studies have focused on this topic to date.

The existing research most relevant to our topic has examined how boom and bust cycles in the mining industry affect economic well-being in resource extraction communities in the United States. This literature has found mixed results. The economic effects of natural resource extraction can be positive in the short-term during

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