Table 1
Variable definitions and descriptive statistics.

Variable	Definition	Mean	Min	Max
G	Annual growth in per capita personal income (1980–1995)	0.013	−0.049	0.076
Resources	Percent of earnings in agriculture, forestry, fishing, mining in 1980	0.051	>0	0.905
Y_{80}	Personal income per capita in 1980	8187	2435	21,366
High School	Percent of county population that graduated high school in 1980	0.204	0.059	0.346
College	Percent of county population with a college degree in 1980	0.066	0.015	0.300
Young	Percent of population that is less than 19 years old in 1980	0.294	0.134	0.481
Old	Percent of population that is at least 65 years old in 1980	0.131	0.008	0.334
Poverty	Percent of population at or below the poverty line in 1980	0.017	0.003	0.061
White	Percent of population Caucasian in 1980	0.880	0.063	<1
Metro	= 1 if population per square mile in 1980 exceeds 300, else zero	0.078	0	1

Notes. All data are from the U.S. Census Bureau. ">0" indicates a negligible percentage, which is censored to zero. Similarly, "<1" indicates a fraction censored at one.

We build upon traditional neoclassical models of cross-country income convergence (Mankiw et al., 1992; Barro and Sala-i-Martin, 1992) to test the curse of natural resources. The empirical model takes the following form:

$$G_i = \beta_1 \ln Y_{0,i} + \beta_2 R_{0,i} + \gamma' X_{0,i} + \alpha_S + \varepsilon_i, \tag{1}$$

where $G_i = (1/T) \ln(Y_{T,i}/Y_{0,i})$ is the growth rate between 1980 and 1995; $\ln Y_{0,i}$ is the natural log of per capita personal income in 1980; $R_{0,i}$ is the share of earnings in resource-extraction industries in 1980; $X_{0,i}$ is a set of socio-economic control variables measured in 1980; α_S is a state-specific fixed effect for $S = 1, \ldots, 50$; and $i = 1, \ldots, 3092$ indexes U.S. counties. We test the curse of natural resources by contrasting the null hypothesis H_0: $\beta_2 \geq 0$ against the alternative H_A: $\beta_2 < 0$. Rejection of the null hypothesis provides evidence that, all else equal, resource abundant U.S. counties exhibit conditionally slower economic growth.

Counties neighboring each other are likely to be similarly impacted by regional economic factors. To account for this possible spatial correlation, we follow Rappaport and Sachs (2003) and Higgins et al. (2006) by allowing a non-zero error covariance between nearby counties. The covariance of the errors between counties i and j is given by

$$\text{cov}(\varepsilon_i, \varepsilon_j) = \sigma_{ij}\alpha \left[1 - \left(\frac{d_{ij}}{200} \right)^2 \right] \tag{2}$$

if d_{ij} (the Euclidean distance between the centers of county i and j) is less than 200 km; zero otherwise. As a result, we impose that the covariance between errors in county i and j are quadratically declining for counties with 200 km of one another. The scale parameter α captures the intensity of the spatial correlation.

The model is estimated with two-stage generalized least squares (GLS). In the first stage, we estimate (1) using OLS and save the residuals (e_i). We then form the following estimate of σ_{ij}, $\hat{\sigma}_{ij} = e_i e_j$, for $i \neq j$. In stage two, we form the estimated error variance–covariance matrix and apply the standard GLS estimator. All estimation results are performed using Gauss version 8.0.

3. Theories of the resource curse and justification for the covariates

Before discussing the empirical results, we briefly review theories for the resource curse and provide justification for the choice of covariates. There are numerous explanations for the resource curse. A leading explanation is the "Dutch Disease" theory (Matsuyama, 1992). This theory states that specialization in resource production and the appreciation of the exchange rate will result in a decline in manufacturing, a sector that is more conducive to growth via increasing returns and positive production externalities. In addition to the Dutch Disease, Auty (1994) argues Latin America may have suffered from resource-induced trade restrictions. Regions endowed with plentiful stocks of natural