

# **Online Appendix**

How Natural Resources Affect Authoritarian Leaders' Provision of  
Public Services: Evidence from China

# Revenue Contribution of Resource Production

Table A.1: Tax on Resource Production (2012)

Tax items	Tax rate and basis	Sharing ratio (central:local)
Enterprise income tax	25% of taxable income	60:40 (100:0 for natural gas)
Value added tax	17% of sales value	75:25
Resource tax	5-10% of sales value	0:100
Special petroleum profit tax (windfall tax)	0-14% (est.) of output when crude oil price > 55 US\$/barrel	
Mineral resources compensation fees	1% (est.) of sales revenue	50:50
Business tax	5% of transferred (license) value	0:100
City construction and maintenance tax	5-7% of VAT, business tax and consumption tax	0:100
National education surcharges	3% of VAT, business tax and consumption tax	100:0
Local education surcharges	2% of VAT, business tax and consumption tax	0:100

Source: Tax Laws of the People's Republic of China

## Tax Breakdowns Between the Central and Local (2012)

Total corporate revenue from resource sales (100%)

Petro sep. profit tax	Value added tax	Resource tax	Corp. tax	Other	Corporate's net income & expenses
0-14% (est.)	17%	5-10%	10-15% (est.)	3%	41-65%
	13% central		6-9% central	1% central	⇒ <b>20-23% to the central gov- ernment</b>
	4% local	5-10% local	3-6% local	2% local	⇒ <b>14-22% to the local gov- ernments</b>

# Summary Statistics

Table A.2: Description of variables (1992-2010)

Variable	Obs	Mean	Std. Dev.	Min	Max
<b>Resources</b>					
Oil sales ( $10^7$ ton $\times$ ln(price))	5453	.1715752	1.027832	0	14.40474
Coal sales ( $10^8$ ton $\times$ ln(price))	5453	.2745567	.7976418	0	15.7952
Gas sales ( $10^8$ $m^3 \times$ ln(price))	5453	.4716213	3.40231	0	118.4896
<b>Demographics</b>					
Population (log, 10,000)	5063	5.67	0.83	2.39	8.09
Land area (log, $km^2$ )	4809	9.16	0.93	4.43	12.44
<b>Economy and government</b>					
Local GDP (log, 10,000 RMB)	4612	14.90	1.18	10.56	18.83
FDI in manufacturing (log, 10,000 RMB)	2849	15.98066	2.469541	6.561698	22.92192
Share of SOE production (%)	2617	3.808933	4.130754	0	98.14592
Gov't rev. (log, 10,000 RMB)	3831	11.75	1.50	7.19	17.05
Gov't exp. (log, 10,000 RMB)	3831	12.36	1.55	7.77	17.21
<b>Education</b>					
Num. of school, primary	4063	1327.37	1190.58	7	16261
Num. of school, secondary	4063	247.75	166.73	9	1607
Num. of school, higher	3822	6.09	10.69	0	88
Num. of student, primary	4873	360289.4	279357.7	3400	2884400
Num. of student, secondary	4873	237490.5	181393.7	100	2305100
Num. of student, higher	4503	40924.05	91520.27	0	846315
Num. of teacher, primary	4622	17480.34	12110.55	608	121062
Num. of teacher, secondary	4622	14194.86	10220.50	155	106544
Num. of teacher, higher	4279	2899.14	6210.85	0	57133
<b>Health care</b>					
Num. of hospital	4807	207.88	194.01	2	2595
Num. of medical trainee	4806	6318.50	6264.53	377	63193
Num. of bed	4807	10566.80	9739.04	609	97980
<b>Infrastructure and other public services</b>					
Construction area ( $km^2$ )	2249	218.38	270.43	0	2429
Const. area for residence ( $km^2$ )	2245	53.36	146.57	0	2144
Num. of post office	5048	217.8051	316.0439	0	9433
Green area (hectare)	4560	3525.74	9770.42	0	168027
Sewage rate (%)	2214	50.54	27.05	0	100

## Alternative Theoretical Claim

Table A.3: Collective Action Mechanism: Coalmine Closure and Education (2007-2010)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Schools</i>			<i>Teachers</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)
Oil sales (lagged, 1 year)	0.013 (0.030)	-0.006 (0.004)	0.050 (0.033)	-0.002 (0.003)	-0.0003 (0.004)	0.034 (0.028)
Coal sales (lagged, 1 year)	-0.000 (0.008)	-0.016*** (0.005)	-0.047*** (0.015)	-0.0003 (0.002)	-0.012*** (0.004)	0.022 (0.024)
Gas sales (lagged, 1 year)	-0.006*** (0.001)	0.0001 (0.0002)	0.003 (0.002)	-0.0003* (0.0002)	-0.0004** (0.0002)	0.004*** (0.001)
Local GDP (log)	-0.377*** (0.079)	-0.143*** (0.038)	-0.057 (0.139)	0.020 (0.027)	0.078*** (0.028)	-0.118 (0.100)
Population (log)	-0.772 (0.970)	-0.185 (0.274)	-0.260 (0.532)	0.260*** (0.089)	0.672*** (0.127)	0.686 (0.851)
Urbanization	0.054 (0.113)	-0.055 (0.055)	-0.092 (0.131)	0.001 (0.023)	-0.0002 (0.024)	-0.074 (0.248)
Land area (log)	-1.142* (0.633)	-0.337 (0.334)	0.246 (0.221)	0.302 (0.387)	-0.049 (0.366)	0.627 (0.494)
Students (log)	0.947** (0.352)	0.056** (0.025)	0.560*** (0.193)	0.172** (0.065)	0.136*** (0.033)	0.584*** (0.122)
<i>N</i>	857	857	825	857	857	835

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects and year fixed effects. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

## Excluding GDP

Table A.4: The Effect of Resource Sales Revenue on Public Education and Health Services (No GDP)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Doctor (log)	Beds (log)
Oil sales (lagged, 1 year)	0.018 (0.025)	-0.013*** (0.005)	0.019 (0.032)	-0.018 (0.011)	-0.015 (0.012)	-0.069* (0.036)	0.126* (0.063)	-0.024* (0.013)	-0.023 (0.020)
Coal sales (lagged, 1 year)	-0.030 (0.018)	-0.021* (0.011)	-0.017 (0.014)	0.001 (0.009)	-0.003 (0.008)	0.003 (0.017)	0.052*** (0.012)	0.006 (0.010)	-0.025* (0.013)
Gas sales (lagged, 1 year)	-0.010*** (0.003)	0.001** (0.001)	-0.002 (0.003)	0.003* (0.002)	0.002 (0.002)	0.003 (0.003)	-0.010 (0.007)	0.009*** (0.001)	0.001 (0.003)
Population (log)	0.653*** (0.143)	0.582*** (0.084)	0.247*** (0.060)	0.636*** (0.083)	0.451*** (0.061)	0.070 (0.078)	0.716*** (0.125)	0.649*** (0.103)	0.648*** (0.099)
Urbanization	-0.063 (0.190)	-0.071 (0.101)	0.481*** (0.124)	0.179** (0.085)	0.051 (0.067)	0.085 (0.074)	-0.052 (0.209)	-0.038 (0.132)	-0.030 (0.124)
Land area (log)	0.065 (0.051)	-0.027 (0.050)	-0.042 (0.050)	0.018 (0.042)	-0.024 (0.035)	-0.026 (0.050)	0.128 (0.078)	-0.052 (0.072)	-0.054 (0.071)
Students (log)	0.526*** (0.112)	0.367*** (0.068)	0.114*** (0.009)	0.421*** (0.085)	0.537*** (0.047)	0.631*** (0.021)			
<i>N</i>	4022	4022	3810	4544	4544	4270	4793	4793	4792

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. E.g. the number of students in primary schools is employed for model (1) and (4), the number of students in secondary schools for model (2) and (5), and the number of students in higher education institutes for model (3) and (6). Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

# Alternative Measurement: Per Capita Measures

Table A.5: The Effects of Per Capita Oil Rents on Public Services Per Capita

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>School (per student)</i>			<i>Teacher (per student)</i>			<i>Health (per capita)</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales (per capita)	0.008 (0.005)	-0.015*** (0.002)	-0.014* (0.007)	-0.023*** (0.002)	-0.016*** (0.002)	0.009 (0.015)	0.039*** (0.002)	-0.016*** (0.002)	-0.017*** (0.003)
Coal sales (per capita)	-0.005 (0.006)	-0.002 (0.004)	-0.012* (0.007)	-0.006* (0.004)	0.005 (0.004)	0.010 (0.009)	0.017*** (0.003)	-0.007* (0.004)	-0.015*** (0.002)
Gas sales (per capita)	-0.001 (0.001)	0.0002 (0.001)	0.0002 (0.0004)	0.002*** (0.000)	-0.0003 (0.001)	-0.0004 (0.001)	-0.001 (0.001)	0.001*** (0.0004)	-0.001* (0.001)
GDP per capita (log)	-0.140*** (0.049)	-0.042 (0.054)	0.009 (0.055)	-0.004 (0.027)	0.017 (0.028)	-0.150*** (0.044)	0.030 (0.019)	0.125*** (0.037)	0.115* (0.057)
Population (log)	0.243 (0.205)	0.081 (0.094)	0.214* (0.119)	-0.050 (0.051)	0.015 (0.044)	-0.0004 (0.093)	-0.087 (0.058)	-0.287*** (0.086)	-0.285*** (0.092)
Urbanization	-0.235 (0.177)	-0.132* (0.078)	0.552*** (0.169)	-0.037 (0.070)	0.026 (0.048)	0.141 (0.091)	-0.014 (0.084)	-0.021 (0.110)	0.038 (0.096)
Land area (log)	0.041 (0.054)	-0.026 (0.030)	0.024 (0.077)	-0.028 (0.026)	-0.051** (0.022)	-0.005 (0.061)	0.054 (0.040)	-0.052 (0.062)	-0.059 (0.063)
<i>N</i>	3695	3695	3429	4460	4460	4101	4458	4458	4457

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. Dependent variables are schools per student, teachers per student, and public health services per capita. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

# Addressing Price Shock

Table A.6: Production Quantity

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil production (lagged, 1 year)	-0.112 (0.152)	-0.013 (0.038)	-0.056 (0.197)	-0.065 (0.063)	-0.010 (0.074)	-0.320 (0.199)	0.395 (0.304)	-0.086 (0.081)	-0.093 (0.098)
Coal sales (lagged, 1 year)	-0.165* (0.088)	-0.113* (0.066)	-0.134** (0.061)	-0.017 (0.063)	-0.033 (0.049)	0.054 (0.092)	0.224*** (0.069)	-0.004 (0.058)	-0.179** (0.066)
Gas sales (lagged, 1 year)	-0.031 (0.029)	0.005 (0.007)	-0.009 (0.025)	0.015 (0.011)	0.002 (0.015)	0.027 (0.029)	-0.061 (0.056)	0.047*** (0.011)	-0.010 (0.020)
Local GDP (log)	-0.081 (0.051)	-0.009 (0.051)	0.106 (0.066)	0.065* (0.036)	0.062** (0.024)	-0.070 (0.048)	0.096* (0.048)	0.122*** (0.040)	0.125** (0.057)
Population (log)	0.840*** (0.300)	0.626*** (0.149)	0.424*** (0.143)	0.598*** (0.093)	0.405*** (0.061)	0.126 (0.085)	0.668*** (0.126)	0.564*** (0.084)	0.583*** (0.071)
Urbanization	-0.153 (0.229)	0.004 (0.100)	0.390*** (0.132)	0.170* (0.084)	0.038 (0.062)	0.104 (0.075)	-0.049 (0.200)	-0.025 (0.114)	0.017 (0.101)
Land area (log)	-0.008 (0.075)	-0.050 (0.061)	-0.047 (0.064)	0.017 (0.040)	-0.023 (0.031)	-0.026 (0.049)	0.118 (0.079)	-0.047 (0.063)	-0.054 (0.062)
Students (log)	0.574*** (0.126)	0.313*** (0.068)	0.110*** (0.009)	0.412*** (0.078)	0.534*** (0.045)	0.631*** (0.021)			
<i>N</i>	3759	3759	3587	4533	4533	4263	4526	4526	4525

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects and year fixed effects. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table A.7: Bust Period (1992 – 2003)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales (lagged, 1 year)	-0.022 (0.066)	-0.025 (0.016)	0.065 (0.065)	0.049 (0.038)	0.034 (0.044)	0.271 (0.321)	0.042 (0.051)	-0.001 (0.029)	-0.008 (0.034)
Coal sales (lagged, 1 year)	-0.068 (0.046)	-0.032 (0.023)	0.033 (0.047)	-0.036 (0.024)	0.004 (0.024)	-0.069 (0.058)	-0.032 (0.115)	-0.008 (0.037)	-0.027 (0.069)
Gas sales (lagged, 1 year)	-0.006 (0.009)	0.004 (0.004)	-0.007 (0.008)	-0.008 (0.007)	-0.003 (0.006)	-0.065* (0.037)	0.021 (0.013)	0.022** (0.009)	-0.011 (0.011)
Local GDP (log)	0.013 (0.033)	0.035 (0.057)	0.051 (0.053)	0.079* (0.042)	0.079** (0.030)	-0.077** (0.036)	0.116 (0.078)	0.135*** (0.048)	0.126** (0.056)
Population (log)	0.670** (0.272)	0.546** (0.224)	0.077 (0.154)	0.554*** (0.100)	0.282*** (0.053)	0.085 (0.095)	0.513*** (0.127)	0.507*** (0.085)	0.511*** (0.093)
Urbanization	-0.126 (0.176)	-0.004 (0.110)	0.216 (0.144)	0.224** (0.085)	0.055 (0.066)	0.014 (0.072)	-0.158 (0.241)	-0.056 (0.155)	-0.054 (0.179)
Land area (log)	-0.055 (0.076)	-0.047 (0.064)	0.021 (0.050)	0.020 (0.044)	-0.025 (0.030)	-0.007 (0.047)	0.176* (0.097)	-0.025 (0.067)	-0.018 (0.075)
Students (log)	0.508*** (0.178)	0.338*** (0.084)	0.114*** (0.008)	0.464*** (0.081)	0.681*** (0.044)	0.588*** (0.031)			
<i>N</i>	1761	1761	1672	2535	2535	2341	2528	2528	2527

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects and year fixed effects. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$



Table A.8: Boom Period (2004 – 2010)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales (lagged, 1 year)	-0.011 (0.033)	-0.012* (0.007)	0.024 (0.016)	-0.007 (0.009)	-0.001 (0.006)	0.053 (0.032)	0.195 (0.164)	-0.049* (0.025)	-0.008 (0.019)
Coal sales (lagged, 1 year)	-0.026* (0.014)	-0.019*** (0.006)	-0.038** (0.014)	-0.007** (0.003)	-0.007* (0.004)	0.035** (0.013)	0.023 (0.026)	0.017 (0.013)	-0.001 (0.020)
Gas sales (lagged, 1 year)	-0.006* (0.003)	0.002** (0.001)	-0.001 (0.002)	0.001 (0.001)	0.0003 (0.0004)	-0.001 (0.002)	-0.011 (0.008)	0.005** (0.002)	-0.001 (0.002)
Local GDP (log)	-0.169* (0.084)	-0.081 (0.048)	0.019 (0.073)	-0.026 (0.020)	-0.001 (0.033)	-0.179** (0.066)	-0.113 (0.213)	-0.009 (0.052)	-0.071 (0.073)
Population (log)	0.225 (0.153)	-0.125*** (0.044)	-0.013 (0.045)	-0.001 (0.055)	0.012 (0.071)	0.019 (0.095)	0.190 (0.306)	0.041 (0.138)	0.031 (0.261)
Urbanization	-0.134 (0.127)	-0.008 (0.042)	-0.067 (0.220)	0.027 (0.061)	-0.060 (0.083)	-0.495** (0.193)	-0.504*** (0.176)	-0.097 (0.074)	-0.467** (0.187)
Land area (log)	-0.402 (0.273)	0.011 (0.261)	0.303 (0.242)	0.129 (0.161)	-0.045 (0.206)	-0.083 (0.148)	-0.791* (0.442)	-0.108 (0.204)	0.253 (0.454)
Students (log)	0.449*** (0.152)	0.108*** (0.034)	0.194** (0.084)	0.279*** (0.037)	0.166*** (0.047)	0.520*** (0.072)			
<i>N</i>	1713	1713	1645	1713	1713	1652	1712	1712	1712

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects and year fixed effects. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

# Addressing Demand for Public Services

Table A.9: Controlling for the Effect of Birth Rate (Natural Population Change, 1 year lagged)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales (lagged, 1 year)	0.010 (0.021)	-0.016** (0.006)	0.009 (0.036)	-0.022* (0.011)	-0.020* (0.011)	-0.064* (0.036)	0.123 (0.074)	-0.032** (0.013)	-0.032 (0.019)
Coal sales (lagged, 1 year)	-0.027 (0.017)	-0.021* (0.012)	-0.029** (0.011)	-0.003 (0.011)	-0.009 (0.009)	0.004 (0.019)	0.042*** (0.013)	-0.003 (0.010)	-0.033** (0.012)
Gas sales (lagged, 1 year)	-0.007* (0.004)	0.002* (0.001)	-0.003 (0.003)	0.003 (0.002)	0.001 (0.002)	0.003 (0.003)	-0.011 (0.008)	0.008*** (0.001)	-0.001 (0.003)
Natural Population Increase (% , 1 years)	0.007* (0.004)	-0.001 (0.001)	-0.002 (0.003)	0.003 (0.002)	-0.0001 (0.002)	0.004 (0.003)	-0.008* (0.004)	-0.0002 (0.003)	-0.001 (0.002)
Local GDP (log)	-0.085 (0.050)	-0.006 (0.051)	0.101 (0.068)	0.064* (0.036)	0.064** (0.025)	-0.077 (0.048)	0.089* (0.047)	0.123*** (0.041)	0.119* (0.059)
Population (log)	0.724** (0.272)	0.658*** (0.156)	0.421*** (0.145)	0.561*** (0.090)	0.418*** (0.060)	0.123 (0.082)	0.704*** (0.126)	0.570*** (0.087)	0.599*** (0.073)
Urbanization	-0.150 (0.221)	0.005 (0.095)	0.370*** (0.132)	0.161* (0.082)	0.045 (0.062)	0.125 (0.074)	-0.036 (0.192)	-0.022 (0.113)	0.028 (0.097)
Land area (log)	0.030 (0.067)	-0.063 (0.058)	-0.053 (0.066)	0.017 (0.037)	-0.028 (0.033)	-0.019 (0.050)	0.104 (0.083)	-0.050 (0.066)	-0.060 (0.064)
Students (log)	0.641*** (0.123)	0.303*** (0.070)	0.111*** (0.009)	0.444*** (0.071)	0.529*** (0.044)	0.632*** (0.021)			
<i>N</i>	3690	3690	3523	4450	4450	4190	4448	4448	4447

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

Table A.10: Controlling for the Effect of Birth Rate (Natural Population Change, 5 year lagged)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales (lagged, 1 year)	0.012 (0.022)	-0.018** (0.007)	0.006 (0.040)	-0.027** (0.010)	-0.023** (0.011)	-0.051 (0.044)	0.127 (0.092)	-0.036*** (0.008)	-0.040*** (0.011)
Coal sales (lagged, 1 year)	-0.017 (0.021)	-0.029 (0.021)	-0.068*** (0.020)	0.001 (0.010)	-0.008 (0.013)	0.001 (0.024)	0.044** (0.018)	0.001 (0.012)	-0.041** (0.017)
Gas sales (lagged, 1 year)	-0.007 (0.005)	0.002** (0.001)	-0.002 (0.002)	0.002* (0.001)	0.001 (0.002)	0.008** (0.003)	-0.017** (0.007)	0.005*** (0.002)	-0.005** (0.002)
Natural Population Increase (% , 5 years)	0.018 (0.014)	-0.005 (0.003)	-0.006 (0.009)	0.004 (0.004)	-0.0001 (0.002)	-0.001 (0.006)	-0.007 (0.009)	0.009* (0.005)	-0.001 (0.003)
Local GDP (log)	-0.064 (0.054)	-0.0001 (0.055)	0.111 (0.077)	0.061* (0.032)	0.041 (0.028)	-0.062 (0.054)	-0.030 (0.050)	0.061* (0.034)	0.043 (0.079)
Population (log)	0.709** (0.259)	0.653*** (0.162)	0.420** (0.159)	0.469*** (0.136)	0.403*** (0.125)	0.124 (0.089)	0.772*** (0.215)	0.583*** (0.102)	0.658*** (0.104)
Urbanization	-0.122 (0.201)	0.018 (0.090)	0.334** (0.134)	0.107** (0.048)	0.108*** (0.036)	0.127 (0.106)	0.202 (0.173)	0.163** (0.078)	0.237*** (0.075)
Land area (log)	0.027 (0.068)	-0.055 (0.058)	-0.054 (0.067)	-0.041 (0.043)	-0.046 (0.042)	-0.036 (0.057)	-0.071 (0.094)	-0.082** (0.033)	-0.104*** (0.025)
Students (log)	0.625*** (0.123)	0.287*** (0.077)	0.114*** (0.009)	0.415*** (0.078)	0.409*** (0.057)	0.632*** (0.023)			
<i>N</i>	3382	3382	3237	3382	3382	3244	3383	3383	3383

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

Table A.11: Controlling for the Effect of Birth Rate (2005 census, population size of age 5)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales (lagged, 1 year)	0.012 (0.033)	-0.015** (0.006)	-0.038 (0.027)	-0.038* (0.021)	-0.032 (0.021)	-0.150** (0.065)	0.248*** (0.082)	-0.033** (0.014)	-0.030 (0.019)
Coal sales (lagged, 1 year)	-0.027* (0.015)	-0.018** (0.008)	-0.023* (0.012)	-0.005 (0.007)	-0.0004 (0.008)	0.016 (0.018)	0.029** (0.013)	0.003 (0.014)	-0.033* (0.016)
Gas sales (lagged, 1 year)	-0.008* (0.004)	0.002** (0.001)	0.001 (0.002)	0.004** (0.002)	0.003 (0.002)	0.014** (0.006)	-0.022*** (0.006)	0.006*** (0.002)	-0.001 (0.002)
Age 5 population (log)	0.045 (0.072)	-0.022 (0.022)	0.013 (0.034)	0.004 (0.016)	-0.028 (0.018)	0.017 (0.047)	-0.041 (0.038)	-0.010 (0.016)	0.023 (0.028)
Local GDP (log)	-0.142 (0.087)	-0.047 (0.054)	0.100 (0.079)	0.056 (0.034)	0.048 (0.038)	-0.123 (0.083)	-0.033 (0.077)	0.063 (0.042)	0.106 (0.079)
Population (log)	0.858*** (0.301)	0.629*** (0.144)	0.574*** (0.142)	0.509*** (0.147)	0.450*** (0.115)	-0.087 (0.315)	0.672*** (0.217)	0.458*** (0.137)	0.679*** (0.228)
Urbanization	-0.021 (0.174)	-0.046 (0.048)	0.220* (0.111)	0.051 (0.045)	0.006 (0.036)	0.167 (0.223)	0.399** (0.186)	0.104* (0.060)	0.167 (0.108)
Land area (log)	0.147** (0.061)	0.018 (0.026)	-0.058 (0.044)	0.024 (0.047)	-0.002 (0.047)	0.023 (0.088)	0.083* (0.042)	-0.009 (0.059)	-0.061 (0.059)
Students (log)	0.466*** (0.116)	0.261*** (0.062)	0.104*** (0.009)	0.282*** (0.088)	0.345*** (0.050)	0.621*** (0.026)			
<i>N</i>	3033	3033	2929	3033	3033	2935	3025	3025	3025

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

# Long-term Dynamics

Table A.12: The Effect of Resource Production on Public Services (3 Year Lagged)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales (lagged, 3 years)	0.009 (0.025)	-0.013** (0.005)	0.009 (0.039)	-0.037** (0.017)	-0.027 (0.019)	-0.131 (0.088)	0.163* (0.089)	-0.049*** (0.008)	-0.038** (0.017)
Coal sales (lagged, 3 years)	-0.043** (0.021)	-0.025* (0.014)	-0.021 (0.016)	-0.002 (0.013)	-0.005 (0.011)	0.016 (0.023)	0.058*** (0.018)	-0.006 (0.014)	-0.039** (0.015)
Gas sales (lagged, 3 years)	-0.010 (0.006)	0.002 (0.002)	-0.004 (0.004)	0.006* (0.003)	0.003 (0.004)	0.012 (0.010)	-0.021** (0.010)	0.012*** (0.002)	-0.001 (0.005)
Local GDP (log)	-0.089* (0.050)	-0.011 (0.050)	0.096 (0.063)	0.061 (0.039)	0.056** (0.027)	-0.060 (0.047)	0.077 (0.049)	0.101** (0.039)	0.101 (0.061)
Population (log)	0.833*** (0.297)	0.631*** (0.151)	0.421*** (0.141)	0.634*** (0.105)	0.457*** (0.068)	0.103 (0.085)	0.734*** (0.133)	0.604*** (0.076)	0.647*** (0.067)
Urbanization	-0.151 (0.230)	0.005 (0.100)	0.393*** (0.131)	0.068 (0.046)	-0.031 (0.064)	0.089 (0.096)	-0.148 (0.218)	-0.090 (0.111)	-0.027 (0.086)
Land area (log)	-0.005 (0.075)	-0.051 (0.061)	-0.045 (0.065)	-0.018 (0.033)	-0.052* (0.029)	-0.021 (0.055)	0.039 (0.074)	-0.088 (0.053)	-0.099* (0.050)
Students (log)	0.576*** (0.126)	0.310*** (0.069)	0.110*** (0.009)	0.388*** (0.085)	0.490*** (0.049)	0.633*** (0.019)			
<i>N</i>	3759	3759	3587	4275	4275	4040	4268	4268	4268

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

Table A.13: The Effect of Resource Production on Public Services (5 Year Lagged)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales (lagged, 5 years)	0.029 (0.024)	-0.011* (0.006)	-0.002 (0.054)	-0.041*** (0.012)	-0.026* (0.014)	-0.105 (0.065)	0.230* (0.123)	-0.060*** (0.008)	-0.048** (0.021)
Coal sales (lagged, 5 years)	-0.037 (0.028)	-0.035* (0.020)	-0.022 (0.021)	-0.0001 (0.013)	-0.007 (0.011)	0.014 (0.022)	0.061* (0.034)	-0.002 (0.019)	-0.037** (0.017)
Gas sales (lagged, 5 years)	-0.019** (0.007)	0.002 (0.002)	-0.003 (0.006)	0.007*** (0.002)	0.004 (0.004)	0.016** (0.007)	-0.032** (0.015)	0.013*** (0.002)	-0.0004 (0.005)
Local GDP (log)	-0.091* (0.052)	-0.014 (0.050)	0.093 (0.062)	0.059* (0.031)	0.044* (0.023)	-0.092 (0.055)	0.008 (0.052)	0.067** (0.032)	0.055 (0.067)
Population (log)	0.831*** (0.295)	0.628*** (0.151)	0.425*** (0.142)	0.516*** (0.135)	0.396*** (0.118)	-0.018 (0.156)	0.659*** (0.214)	0.610*** (0.111)	0.689*** (0.116)
Urbanization	-0.150 (0.230)	0.005 (0.101)	0.393*** (0.130)	0.114** (0.049)	0.096** (0.036)	0.180 (0.135)	0.192 (0.174)	0.146* (0.075)	0.221*** (0.070)
Land area (log)	-0.003 (0.075)	-0.050 (0.061)	-0.046 (0.065)	-0.048 (0.044)	-0.049 (0.040)	0.006 (0.073)	-0.041 (0.086)	-0.091** (0.039)	-0.121*** (0.032)
Students (log)	0.571*** (0.126)	0.311*** (0.069)	0.110*** (0.009)	0.368*** (0.085)	0.416*** (0.050)	0.633*** (0.020)			
<i>N</i>	3759	3759	3587	3759	3759	3594	3753	3753	3753

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

Table A.14: The Effect of Resource Production on Public Services (Past 3-Year Average)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales (past 3-year avg.)	0.010 (0.023)	-0.015** (0.006)	0.010 (0.039)	-0.032** (0.013)	-0.025 (0.015)	-0.100 (0.064)	0.152* (0.085)	-0.044*** (0.008)	-0.035* (0.018)
Coal sales (past 3-year avg.)	-0.037* (0.020)	-0.025* (0.013)	-0.024* (0.013)	-0.003 (0.013)	-0.006 (0.011)	0.012 (0.021)	0.050*** (0.016)	-0.004 (0.013)	-0.037** (0.014)
Gas sales (past 3-year avg.)	-0.009* (0.005)	0.002 (0.001)	-0.004 (0.004)	0.004* (0.002)	0.003 (0.003)	0.008 (0.007)	-0.018* (0.009)	0.010*** (0.001)	-0.001 (0.004)
Local GDP (log)	-0.087* (0.049)	-0.008 (0.050)	0.100 (0.064)	0.062 (0.039)	0.057** (0.028)	-0.059 (0.049)	0.072 (0.050)	0.101** (0.040)	0.105* (0.061)
Population (log)	0.832*** (0.297)	0.631*** (0.151)	0.420*** (0.141)	0.633*** (0.105)	0.456*** (0.069)	0.100 (0.087)	0.737*** (0.134)	0.603*** (0.076)	0.646*** (0.067)
Urbanization	-0.153 (0.230)	0.004 (0.100)	0.391*** (0.131)	0.068 (0.046)	-0.031 (0.064)	0.088 (0.096)	-0.148 (0.219)	-0.090 (0.111)	-0.028 (0.086)
Land area (log)	-0.005 (0.074)	-0.052 (0.060)	-0.046 (0.065)	-0.018 (0.033)	-0.052* (0.029)	-0.019 (0.056)	0.040 (0.074)	-0.087 (0.053)	-0.100* (0.050)
Students (log)	0.576*** (0.125)	0.311*** (0.068)	0.110*** (0.009)	0.387*** (0.085)	0.490*** (0.049)	0.632*** (0.020)			
<i>N</i>	3759	3759	3587	4275	4275	4040	4268	4268	4268

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

Table A.15: The Effect of Resource Production on Public Services (Past 5-Year Average)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales (past 5-year average)	0.015 (0.025)	-0.016** (0.006)	0.009 (0.045)	-0.037*** (0.013)	-0.025 (0.016)	-0.107 (0.070)	0.194* (0.112)	-0.053*** (0.007)	-0.039** (0.018)
Coal sales (past 3-year average)	-0.044* (0.024)	-0.030* (0.016)	-0.027* (0.015)	-0.004 (0.013)	-0.001 (0.011)	0.016 (0.023)	0.057** (0.021)	0.000 (0.018)	-0.041** (0.018)
Gas sales (past 5-year average)	-0.011* (0.006)	0.002 (0.001)	-0.004 (0.005)	0.006** (0.002)	0.003 (0.003)	0.012 (0.008)	-0.026** (0.012)	0.011*** (0.002)	0.0003 (0.004)
Local GDP (log)	-0.087* (0.050)	-0.009 (0.050)	0.099 (0.063)	0.062* (0.031)	0.045* (0.025)	-0.086 (0.057)	-0.007 (0.051)	0.069** (0.033)	0.063 (0.068)
Population (log)	0.831*** (0.297)	0.630*** (0.151)	0.421*** (0.141)	0.517*** (0.135)	0.397*** (0.118)	-0.015 (0.151)	0.658*** (0.213)	0.611*** (0.112)	0.688*** (0.117)
Urbanization	-0.152 (0.230)	0.004 (0.100)	0.391*** (0.131)	0.114** (0.049)	0.096** (0.036)	0.177 (0.135)	0.198 (0.176)	0.145* (0.075)	0.219*** (0.070)
Land area (log)	-0.005 (0.074)	-0.052 (0.060)	-0.046 (0.065)	-0.048 (0.044)	-0.050 (0.040)	0.005 (0.071)	-0.040 (0.084)	-0.091** (0.039)	-0.122*** (0.033)
Students (log)	0.575*** (0.126)	0.311*** (0.069)	0.110*** (0.009)	0.367*** (0.085)	0.415*** (0.050)	0.634*** (0.020)			
<i>N</i>	3759	3759	3587	3759	3759	3594	3753	3753	3753

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .



Table A.16: Long-term Dynamics (No Lagged)

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales	0.005 (0.010)	-0.002 (0.004)	-0.007 (0.014)	-0.007 (0.007)	-0.008 (0.006)	-0.036* (0.021)	0.013 (0.019)	-0.004 (0.008)	-0.013 (0.010)
Coal sales	-0.009 (0.010)	-0.006 (0.006)	-0.012* (0.007)	-0.001 (0.008)	-0.002 (0.006)	0.0004 (0.011)	0.026** (0.010)	0.003 (0.006)	-0.014** (0.007)
Gas sales	-0.003 (0.002)	0.001 (0.001)	-0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.002)	-0.002 (0.005)	0.004*** (0.001)	-0.001 (0.002)
Local GDP (log)	-0.108** (0.052)	-0.016 (0.048)	0.093 (0.063)	0.064* (0.036)	0.061** (0.022)	-0.071 (0.046)	0.113** (0.046)	0.124*** (0.038)	0.113* (0.057)
Population (log)	0.837*** (0.298)	0.627*** (0.149)	0.426*** (0.143)	0.598*** (0.093)	0.407*** (0.061)	0.119 (0.086)	0.671*** (0.126)	0.561*** (0.084)	0.587*** (0.072)
Urbanization	-0.148 (0.229)	0.006 (0.101)	0.393*** (0.130)	0.170* (0.084)	0.038 (0.063)	0.100 (0.075)	-0.044 (0.198)	-0.027 (0.114)	0.018 (0.102)
Land area (log)	-0.007 (0.074)	-0.050 (0.061)	-0.047 (0.065)	0.018 (0.040)	-0.023 (0.031)	-0.023 (0.051)	0.109 (0.079)	-0.046 (0.063)	-0.051 (0.063)
Students (log)	0.582*** (0.124)	0.312*** (0.069)	0.110*** (0.009)	0.412*** (0.078)	0.533*** (0.045)	0.631*** (0.021)			
<i>N</i>	3759	3759	3587	4533	4533	4263	4526	4526	4525

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

# Alternative Measures of Natural Resources

Table A.17: The Effect of Potential Oil Sales on Public Education and Health Services

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Potential oil sales	0.100 (0.490)	-0.170** (0.077)	0.448** (0.204)	-0.079 (0.081)	-0.227** (0.092)	-0.235 (0.298)	0.119 (0.274)	-0.056 (0.145)	-0.143 (0.112)
Local GDP (log)	-0.115** (0.053)	-0.017 (0.047)	0.081 (0.064)	0.065* (0.035)	0.062*** (0.021)	-0.078* (0.045)	0.065 (0.040)	0.193*** (0.033)	0.214*** (0.040)
Population (log)	0.837*** (0.296)	0.629*** (0.149)	0.427*** (0.142)	0.599*** (0.092)	0.408*** (0.062)	0.119 (0.085)	0.617*** (0.082)	0.514*** (0.052)	0.551*** (0.041)
Urbanization (%)	-0.146 (0.229)	0.005 (0.102)	0.402*** (0.131)	0.169* (0.085)	0.037 (0.063)	0.100 (0.076)	0.136 (0.138)	0.144* (0.083)	0.287*** (0.047)
Land area (log)	-0.006 (0.074)	-0.050 (0.061)	-0.045 (0.067)	0.017 (0.040)	-0.024 (0.031)	-0.020 (0.052)	0.216*** (0.046)	-0.034 (0.034)	0.001 (0.026)
Students (log)	0.585*** (0.124)	0.311*** (0.069)	0.110*** (0.009)	0.411*** (0.078)	0.532*** (0.045)	0.631*** (0.021)			
<i>N</i>	3759	3759	3587	4533	4533	4263	2858	2858	2858

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. Potential sales revenue is a multiplication of quantity of reserves and domestic price (log). *Students* represents log of number of students at the relevant level. Variables not shown include prefecture fixed effects, year fixed effects and constants. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

# Possibility of Non-linear Relationship

Table A.18: Non-linear Model

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<i>Schools</i>			<i>Teachers</i>			<i>Health</i>		
	Primary (log)	Secondary (log)	Higher (log)	Primary (log)	Secondary (log)	Higher (log)	Hospital (log)	Bed (log)	Doctor (log)
Oil sales	-0.049	-0.007	0.076	0.034	0.030	-0.031	-0.019	-0.010	0.016
(lagged, 1 year)	(0.060)	(0.018)	(0.079)	(0.032)	(0.025)	(0.107)	(0.173)	(0.053)	(0.061)
Oil sales <sup>2</sup>	0.004	-0.001	-0.005	-0.005*	-0.004**	-0.003	0.012	-0.002	-0.004
	(0.004)	(0.001)	(0.006)	(0.003)	(0.002)	(0.009)	(0.014)	(0.004)	(0.004)
Coal sales	-0.039	-0.041*	-0.043	0.004	-0.025	-0.045	0.073*	-0.030	-0.079***
(lagged, 1 year)	(0.039)	(0.022)	(0.026)	(0.017)	(0.018)	(0.042)	(0.037)	(0.022)	(0.026)
Coal sales <sup>2</sup>	0.001	0.002**	0.002	-0.001	0.002	0.006*	-0.003	0.003*	0.005***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.002)
Gas sales	0.003	0.006**	-0.009*	0.001	-0.002	-0.006	-0.012	0.014***	-0.006
(lagged, 1 year)	(0.006)	(0.002)	(0.004)	(0.004)	(0.005)	(0.006)	(0.017)	(0.005)	(0.008)
Gas sales <sup>2</sup>	-0.000**	.	0.000	0.000	0.000	0.000*	0.000	-0.000*	0.000
	(0.000)	.	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Local GDP	-0.081	-0.005	0.097	0.064*	0.063**	-0.073	0.097**	0.125***	0.125**
(log)	(0.049)	(0.051)	(0.066)	(0.037)	(0.024)	(0.049)	(0.047)	(0.040)	(0.058)
Population	0.829***	0.633***	0.427***	0.600***	0.408***	0.128	0.666***	0.562***	0.584***
(log)	(0.296)	(0.152)	(0.141)	(0.093)	(0.062)	(0.084)	(0.124)	(0.083)	(0.072)
Urbanization	-0.158	0.001	0.391***	0.172*	0.040	0.103	-0.050	-0.026	0.018
	(0.230)	(0.100)	(0.132)	(0.085)	(0.062)	(0.074)	(0.201)	(0.113)	(0.100)
Land area	-0.004	-0.053	-0.049	0.016	-0.025	-0.027	0.120	-0.047	-0.055
(log)	(0.074)	(0.060)	(0.064)	(0.040)	(0.031)	(0.049)	(0.078)	(0.063)	(0.063)
Students	0.575***	0.310***	0.110***	0.413***	0.534***	0.632***			
(log)	(0.125)	(0.068)	(0.009)	(0.077)	(0.044)	(0.020)			
<i>N</i>	3759	3759	3587	4533	4533	4263	4526	4526	4525

*Notes.* Robust standard errors clustered at the province level are shown in parentheses. *Students* represents log of number of students at the relevant level. Sales is a multiplication of quantity of production in the given prefecture-city and domestic price (log). Variables not shown include prefecture fixed effects and year fixed effects. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

## Alternative Mechanisms

Table A.19: Resource Production and Student Population Change

	(1) Primary	(2) Secondary	(3) Higher
Oil sales (lagged, 1 year)	-0.013 (0.033)	-0.035 (0.021)	0.181 (0.197)
Coal sales (lagged, 1 year)	-0.0001 (0.017)	-0.006 (0.018)	0.043 (0.119)
Gas sales (lagged, 1 year)	-0.004 (0.004)	0.007** (0.003)	-0.015 (0.017)
Local GDP (log)	0.296*** (0.091)	0.201*** (0.063)	0.024 (0.189)
Urbanization	-0.224* (0.129)	-0.338** (0.129)	-0.072 (0.209)
Land area (log)	0.479*** (0.058)	0.356*** (0.039)	0.036 (0.088)
<i>N</i>	4533	4533	4271

Standard errors in parentheses

\*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table A.20: Prior Public Good Provision (1990s) and Future FDI (2000s)

	(1)	(2)	(3)	(4)	(5)	(6)
average primary student share in 1990s	-0.009*** (0.003)			-0.011*** (0.003)		
average secondary student share in 1990s	30.667*** (9.322)			32.883*** (9.577)		
average tertiary student share in 1990s	0.007*** (0.002)			0.006*** (0.002)		
average primary school per capita in 1990s		-0.026 (0.029)			-0.025 (0.031)	
average secondary school per capita in 1990s		-1.743*** (0.666)			-1.745** (0.700)	
average tertiary school per capita in 1990s		27.557*** (7.207)			25.228*** (7.206)	
average primary teacher per capita in 1990s			-0.015* (0.009)			-0.018** (0.009)
average secondary teacher per capita in 1990s			0.015 (0.015)			0.028* (0.015)
average tertiary teacher per capita in 1990s			0.050*** (0.017)			0.042*** (0.016)
average oil sales in 1990s				-0.184*** (0.054)	-0.155** (0.062)	-0.186*** (0.056)
average coal sales in 1990s				-0.574*** (0.164)	-0.317** (0.133)	-0.575*** (0.162)
average gas sales in 1990s				-0.059* (0.031)	-0.105*** (0.038)	-0.074** (0.033)
average GDP in 1990s	1.576*** (0.227)	1.837*** (0.217)	1.800*** (0.258)	1.626*** (0.237)	1.895*** (0.232)	1.796*** (0.271)
Special Economic Zone	0.147 (0.279)	0.010 (0.299)	0.088 (0.282)	0.066 (0.277)	-0.050 (0.299)	-0.006 (0.275)
average population in 1990s	-0.347 (0.266)	-0.650** (0.265)	-0.682** (0.337)	-0.380 (0.279)	-0.697** (0.282)	-0.620* (0.352)
average SOE production share in 1990s	-2.374*** (0.466)	-1.879*** (0.486)	-2.272*** (0.511)	-1.920*** (0.464)	-1.476*** (0.497)	-1.882*** (0.519)
land area	-0.470*** (0.109)	-0.330*** (0.118)	-0.366*** (0.128)	-0.440*** (0.109)	-0.302** (0.118)	-0.354*** (0.128)
constant	-3.859 (2.392)	-5.739** (2.355)	-5.225** (2.570)	-4.701* (2.484)	-6.619*** (2.486)	-5.915** (2.667)
<i>N</i>	255	255	255	255	255	255

*Notes.* Robust standard errors are shown in parentheses. FDI in Manufacturing is FDI  $\times$  Share of manufacturing sector. FDI is actual amount of actually used foreign direct investment. The Share of manufacturing sector is measured by the share of employment in manufacturing sector out of total employment. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

Table A.21: Mineral Price Trends in China

Year	Daqing (US Dollar/barrel)	Global (Brent) (US Dollar/barrel)	Coal (RMB Yuan/ton)
1992	18.9	19.32	60.56
1993	17.75	16.97	84.60
1994	15.82	15.82	103.38
1995	17.16	17.02	115.06
1996	20.14	20.67	130.82
1997	19.01	19.09	141.29
1998	12.36	12.72	136.49
1999	17.59	17.97	129.39
2000	28.98	28.50	126.93
2001	23.45	24.44	135.18
2002	24.85	25.02	150.86
2003	28.87	28.83	161.42
2004	37.14	38.27	187.25
2005	51.06	54.52	221.33
2006	63.06	65.14	234.16
2007	69.56	72.39	238.85
2008	92.41	97.26	291.63
2009	60.81	61.67	192.48
2010	78.29	79.50	265.23

Sources: Daqing - SCI Group (<http://www.chem99.com/>), Global (Brent) - Bp (bp.com), Coal - Wu, Wang and Zhang (2010); National Bureau of Statistics (2012).

Table A.22: Oilfields in Chian

Oilfield	Province	Proven oil reserves (Approximate, 10,000 ton)
Daqing Oilfield	Heilongjiang	636,000
Shengli Oilfield	Shandong	500,000
Liaohe Oilfield	Liaoning	240,000
Karamay Oilfield	Xinjiang	27,800
Sichuan Oilfield	Sichuan	300
Huabei Oilfield	Hebei	110,000
Dagang Oilfield	Tianjin	93,600
Zhongyuan Oilfield	Henan, Shandong	45,500
Jilin Oilfield	Jilin	5,000
Henan Oilfield	Henan	17,000
Changqing Oilfield	Shaanxi, Ganshu, Ningxia, Inner Mongolia, Shanxi	300,000
Jianghan Oilfield	Hubei	35,800
Jiangsu Oilfield	Jiangsu	17,400
Qinghai Oilfield	Qinghai	5,018
Tarim Oilfield	Xinjiang	52,000
Tuha Oilfield	Xinjiang	29,000
Yumen Oilfield	Ganshu	5,000
Dianqiangui	Yunnan, Guizhou and Guangxi	1,269
Jidong Oilfield	Hebei	17,662

*Notes.* Oilfields include gas fields. Reserves are from variable sources. Detailed sources are provided in the text.

Table A.23: Oil and Gas Producing Cities in China

Province	Prefecture	Oilfields	Province	Prefecture	Oilfields
Heilongjiang	Daqing	43	Jilin	Changchun	3
Shandong	Dongying	30	Jilin	Siping	3
Guangxi	Baise	24	Liaoning	Anshan	3
Heilongjiang	Suihua	24	Shandong	Dezhou	3
Qinghai	Haixi Mongol and Tibetan	21	Shandong	Heze	3
Sichuan	Luzhou	21	Shandong	Weifang	3
Xinjiang Uygur	Aksu	19	Sichuan	Dazhou	3
Shandong	Binzhou	18	Xinjiang Uygur	Khotan	3
Chongqing	Chongqing	16	Xizang	Nagchu	3
Hubei	Qianjiang	15	Guizhou	Anshun	2
Xinjiang Uygur	Bayin'gholin Mongol	14	Guizhou	Qiannan Buyei and Miao	2
Hebei	Cangzhou	12	Guizhou	Zunyi	2
Jilin	Songyuan	12	Hainan	Haikou	2
Shaanxi	Yulin	12	Henan	Kaifeng	2
Jiangsu	Yangzhou	11	Liaoning	Fuxin	2
Shaanxi	Yan'an	11	Liaoning	Jinzhou	2
Nei Mongol	Hulunbuir	10	Liaoning	Liaoyang	2
Sichuan	Yibin	10	Ningxia Hui	Yinchuan	2
Gansu	Jiuquan	9	Shandong	Liaocheng	2
Nei Mongol	Xilin Gol	9	Sichuan	Guangyuan	2
Xinjiang Uygur	Changji Hui	9	Sichuan	Leshan	2
Gansu	Qingyang	8	Sichuan	Mianyang	2
Heilongjiang	Qiqihar	8	Gansu	Jinchang	1
Nei Mongol	Ordos	8	Gansu	Linxia Hui	1
Xinjiang Uygur	Turfan	8	Guizhou	Bijie	1
Hubei	Jingzhou	7	Hebei	Shijiazhuang	1
Jilin	Baicheng	7	Hebei	Tangshan	1
Liaoning	Panjin	7	Heilongjiang	Harbin	1
Hebei	Langfang	6	Henan	Zhumadian	1
Ningxia Hui	Wuzhong	6	Hubei	Enshi Tujia and Miao	1
Sichuan	Neijiang	6	Hubei	Tianmen	1
Sichuan	Zigong	6	Hubei	Xiantao	1
Henan	Nanyang	5	Jiangsu	Yancheng	1
Jiangsu	Taizhou	5	Qinghai	Haidong	1
Liaoning	Shenyang	5	Shaanxi	Tongchuan	1
Xinjiang Uygur	Karamay	5	Shandong	Jinan	1
Xinjiang Uygur	Kashgar	5	Shanghai	Shanghai	1
Henan	Puyang	4	Shanxi	Luliang	1
Jiangsu	Huai'an	4	Sichuan	Bazhong	1
Sichuan	Guang'an	4	Sichuan	Chengdu	1
Sichuan	Nanchong	4	Sichuan	Meishan	1
Sichuan	Suining	4	Xinjiang Uygur	Altay	1
Tianjin	Tianjin	4	Xinjiang Uygur	Ili Kazakh	1
Xinjiang Uygur	Tacheng	4			

Cities are prefecture-level.



Table A.24: (Major) Coal Producing Cities in China

Province	Prefecture	Coal mines	Province	Prefecture	Coal mines
Chongqing	Chongqing	4	Henan	Sanmenxia	1
Nei Mongol	Hulunbuir	4	Henan	Xuchang	1
Fujian	Sanming	3	Henan	Zhengzhou	1
Guizhou	Liupanshui	3	Hubei	Huangshi	1
Hebei	Shijiazhuang	3	Hubei	Jingzhou	1
Jiangsu	Xuzhou	3	Hubei	Xianning	1
Jiangxi	Yichun	3	Hunan	Chenzhou	1
Shaanxi	Tongchuan	3	Hunan	Hengyang	1
Shandong	Tai'an	3	Hunan	Shaoyang	1
Shanxi	Linfen	3	Jiangsu	Changzhou	1
Anhui	Xuancheng	2	Jiangsu	Wuxi	1
Beijing	Beijing	2	Jiangxi	Ji'an	1
Fujian	Longyan	2	Jiangxi	Jingdezhen	1
Guangdong	Meizhou	2	Jiangxi	Pingxiang	1
Guangdong	Shaoguan	2	Jiangxi	Shangrao	1
Guangxi	Chongzuo	2	Jilin	Jilin	1
Guangxi	Hechi	2	Jilin	Liaoyuan	1
Hebei	Handan	2	Jilin	Tonghua	1
Heilongjiang	Jixi	2	Jilin	Yanbian Korean	1
Nei Mongol	Wuhai	2	Liaoning	Chaoyang	1
Ningxia Hui	Shizuishan	2	Liaoning	Fushun	1
Qinghai	Haidong	2	Liaoning	Fuxin	1
Shaanxi	Weinan	2	Liaoning	Huludao	1
Shanxi	Datong	2	Liaoning	Shenyang	1
Shanxi	Jinzhong	2	Liaoning	Tieling	1
Shanxi	Xinzhou	2	Nei Mongol	Baotou	1
Shanxi	Yangquan	2	Nei Mongol	Chifeng	1
Sichuan	Dazhou	2	Nei Mongol	Xilin Gol	1
Anhui	Hefei	1	Ningxia Hui	Yinchuan	1
Anhui	Huaibei	1	Shandong	Linyi	1
Anhui	Suzhou	1	Shandong	Weifang	1
Gansu	Baiyin	1	Shandong	Yantai	1
Gansu	Lanzhou	1	Shandong	Zaozhuang	1
Guangdong	Maoming	1	Shandong	Zibo	1
Guangxi	Baise	1	Shanxi	Jincheng	1
Guangxi	Hezhou	1	Shanxi	Taiyuan	1
Guangxi	Laibin	1	Sichuan	Chengdu	1
Guangxi	Nanning	1	Sichuan	Guangyuan	1
Guizhou	Guiyang	1	Sichuan	Luzhou	1
Guizhou	Zunyi	1	Sichuan	Meishan	1
Hebei	Chengde	1	Sichuan	Mianyang	1
Hebei	Tangshan	1	Sichuan	Panzhuhua	1
Hebei	Xingtai	1	Sichuan	Yibin	1
Hebei	Zhangjiakou	1	Xinjiang Uygur	Urumqi	1
Heilongjiang	Hegang	1	Xinjiang Uygur	Hami	1
Heilongjiang	Shuangyashan	1	Yunnan	Qujing	1
Henan	Hebi	1	Zhejiang	Huzhou	1
Henan	Jiaozuo	1			

Cities are prefecture-level.

Coal mines indicate the number of mines producing all types of coal more than .5 million tons a year.

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