THE GOODWIN DECISION'S IMPACTS ON
COAL PRODUCTION AND ECONOMIC OUTCOMES:
A PRELIMINARY DISCUSSSION

Michael J. Hicks

And

Mark L. Burton[1]

Center for Business and Economic Research
Marshall University
Huntington, West Virginia

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Introduction

Historically, the mining, preparation and transportation of coal have been important sources of economic activity throughout much of West Virginia, eastern Kentucky, western Virginia, southeastern Ohio, and southern Pennsylvania. While the present-day economies within these regions are somewhat more diverse, coal mining and related activities continue to represent a substantial share of total commercial activity. For example, in West Virginia, coal revenues represent between 12 and 15 percent of Gross State Product (GSP).[2] Moreover, in many coal producing counties, mining and related activities account for between 25 and 40 percent of all commerce.[3] Coal and coal related economic activities also contribute substantial revenues to state and local government operations. Again focusing on West Virginia, 2001

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[1] The authors may be contacted at 304-696-2382 or burtonm@marshall.edu

[2] Sources: US Department of Energy, Energy Information Administration Coal Industry Annual, 2003 and US Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, 2004.

[3] See Mark Burton, Michael Hicks and Cal Kent , *The Fiscal Implications of Judicially Imposed Surface Mining Restrictions in West Virginia.* Center for Business and Economic Research, February 2001, and by the same authors *Coal Production Forecasts and Economic Impact Simulations in Southern West Virginia*, Calvin Kent, Center for Business and Economic Research, Marshall University, June 2000.

estimates suggest that direct and indirect coal-related tax collections were in excess of $300 million.[4]

It was, in fact, the linkage between potential restrictions on mining practices and West Virginia's fiscal well-being that motivated the state's Senate Finance Committee to commission a study from Marshall University's Center for Business and Economic Research (CBER) that quantified the dependence of state revenues on mining operations. This study, released in 2001, found that any restrictions that significantly limit the use of mountaintop mining as a surface mining process would lead to non-trivial short-run fiscal shortfalls.[5] Depending on the form of the restrictions and the speed of their implementation, the CBER study estimated that significant restrictions on mountaintop mining could result in a loss of state and local revenues that totals more than $168 million annually.

In terms of methodology, the Marshall study combined a number of unique elements to produce county-specific depictions of mining-related economic activity. The study used county-specific forecasts of both surface and underground mined tonnages developed in earlier work to create base-line scenarios.[6] Next, the restrictions were allowed to impact forecasted tonnages in two distinct ways. First, after much analysis, the study team concluded that any significant restrictions on mountaintop mining would virtually end all surface mining. Second, earlier estimates of the relationship between ongoing surface mining and the feasibility of underground mining also led the study's investigators to marginally reduce underground tonnages in some cases.[7]

Restriction-induced reductions in mined tonnages were then translated into reduced firm expenditures for labor and locally purchased equipment and materials. These effects were used to drive economic simulation software that translates isolated economic actions into broader economic impacts. Finally, the broader economic impacts were used to estimate the fiscal impact on state and local governments.

The Marshall analysis received substantial attention from both advocates and opponents of surface mining restrictions. Ultimately, however, critics of the study were unable to identify any meaningful deficiencies in data or methodology. Moreover, results from subsequent studies

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[4] *Ibid*

[5] *Ibid*

[6] See Mark Burton, Michael Hicks and Cal Kent, *The Fiscal Implications of Judicially Imposed Surface Mining Restrictions in West Virginia.* Center for Business and Economic Research, February 2001, and by the same authors *Coal Production Forecasts and Economic Impact Simulations in Southern West Virginia*, Center for Business and Economic Research, Marshall University, June 2000.

[7] The relationship between underground and surface mining is a variant of what economists refer to as economies of scope. Very simply, there are some underground operations that are only viable if their regional inputs are shared or their output quantity is combined with coal volumes stemming from nearby surface operations in the preparation and transportation processes. For a fuller explanation see Mark Burton, Michael Hicks and Cal Kent *Coal Production Forecasts and Economic Impact Simulations in Southern West Virginia*, Center for Business and Economic Research, Marshall University, June 2000.

performed by scholars at West Virginia University tend to validate both the Marshall study's methods and findings.[8] The Marshall study effort accompanied the state's filing in the appeal of the Haden decision before the US Court Appeals fourth circuit and an updated version of the study's findings was filed as testimony before the US Senate.[9]

The initial Marshall work was designed to analyze the potential impacts or judicial rulings by Judge Charles Haden which prohibited the placement of valley fills within 100 feet of either intermittent or perennial streams. Those rulings were later overturned by the US Fourth Circuit Court of Appeals.

More recently, U.S. District Judge Joseph R. Goodwin has ruled that the method used by the US Army Corp of Engineers to permit the placement of valley fills is in violation of the Clean Water Act. Judge Goodwin's decision disallows further issuance of "404(e)" permits, at least as the Corps has extended them in the past, and it ordered the revocation of several existing 404(e) permits at mine sites where construction has not commenced. The balance of the current document is intended as a preliminary discussion of the potential impacts of this ruling on economic and fiscal conditions in West Virginia.

Impacts on Coal Production

At the current time, there is great uncertainty regarding the Goodwin decision's impact on coal output volumes during the coming years. What is known is that scheduled production from the eleven previously permitted sites will not be forthcoming as soon as expected. Based on the permit applications, this amounts to roughly 33 to 44 million tons over the next two years.[10] Beyond this, we are left with a host of, as yet, unanswered questions. These include, but are not limited to:

- Will the reduction in surface volumes associated with the disallowed permits affect the viability of nearby underground operations?

- Will the disallowed permits, in combination with relatively high spot market prices cause firms to mine surviving permits more thoroughly?

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[8] Mountaintop Mining/Valley Fill Environmental Impact Statement, Environmental Protection Agency, 2003.George Hammond (2004) *Consensus Coal Production Forecast for West Virginia*, West Virginia University, May 2004.

[9] See *Bragg v. Robertson, Civil Action 2:98-6136, U.S. District court for Southern West Virginia, 2004* and *Joint Statement* of Mark L. Burton and Michael J. Hicks, 2002, Committee on the Environment and Public Works, United States Senate, 107rd Congress, Senator James M. Jeffords (I-VT) Chair.

[10] As of this writing, West Virginia's Division of Environmental Protection is collecting data on the potential lost tonnage associated with the affected permits. Using a range of 3 to four million tons per year produced at each site we estimate annual losses in this magnitude.

- How will the need for additional 404(a) permits affect the cost and time-frame for permitting new mine sites and will the US Army Corps of Engineers devote additional resources to the permitting process if necessary?

- Ultimately, will existing 404(e) permits, under which there is ongoing production, be affected?

The combined answers to these questions will determine the Goodwin decision's impact on coal production in southern West Virginia

The micro-economic theory necessary to understanding the current circumstance was established more than a century ago. Profit maximizing output quantities over any given period are a function of expected output prices and the cost of productive inputs (capital, labor, and other inputs) over the planning horizon. Functionally, this relationship may be represented very simply as:

(1) $$Q = f\,(P_Q, \mathbf{P_I})$$

In the current setting, P_Q represents the expected mine-mouth price of coal and $\mathbf{P_I}$ reflects the costs of the various inputs necessary to productions

The Goodwin decision may well have altered both of the functional determinants of Q as represented above. First, by withholding previously planned surface production at eleven locations and by changing the permitting process for further sites, Judge Goodwin's decision fundamentally alters $\mathbf{P_I}$. The permitting process is a non-trivial component of the capital costs associated with mine development. By subjecting proposed permits to additional environmental scrutiny, the Goodwin ruling unquestionably increases these capital costs. The magnitude of the cost increases will depend on the level of additional scrutiny and the timeliness with which the Corps of Engineers can accomplish the additional work.

Moreover, Hicks and Burton (2000) clearly establish that there are links between surface quantities and the cost of underground mining.[11] These linkages are attributable to several factors including the need to blend coals with disparate qualities and localized scale economies in the preparation and transportation of outputs. Thus, the Goodwin decision will almost certainly affect both surface and underground production costs at existing facilities.

It is also important to note that, within Equation (1), P_Q is the *expected* price of coal over the life-span of the proposed mine site. A confluence of events has created a setting in which current prices for southern Appalachian coal are much higher than those observed in recent years.[12] However, there is an indisputable long-run *downward* trend in the real mine-mouth price of coal. Thus, if history offers any guidance, the high current prices will almost certainly give

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[11] See Mark Burton, Michael Hicks and Cal Kent *Coal Production Forecasts and Economic Impact Simulations in Southern West Virginia*, Center for Business and Economic Research, Marshall University, June 2000.

[12] These events include crude oil prices in excess of $40 per barrel, the withdrawal of Chinese coal from international markets, and continued constraints on the production of natural gas.

way within the foreseeable future. Hence there are presently opportunities to profitably mine coal reserves that are highly transitory in nature. As coal prices inevitably return to their long-run trend, some portion of the coal that West Virginia producers are currently seeking to permit will no longer be economically viable. Ultimately, coal production that is foregone due to protracted permitting process may not take place at all within the time frame that is relevant to the current policy setting.

The outcome outlined above may, however, be partially offset by increased production from existing facilities. High mine-mouth prices, combined with heightened capital costs for new mines should induce producers to extract greater coal volumes from mines with already established (and relatively lower) capital costs. The extent of this offset, will depend on how rapidly other input costs increase as producers attempt to mine coal that would, otherwise, be unminable at lower prices. It is also highly dependent on whether or not existing facilities may continue to be operated under existing 404(e) permits.

Coal Production and Economic Outcomes

As noted in the introduction, much of the West Virginia economy remains heavily dependent on coal mining activity. This is particularly true in the southern coal producing counties. The relative importance of coal in terms of employment and incomes is highlighted in Table 1.

Table 1
Coal Mining Employment & Wages for Selected Counties

County	Employment	Total Wages
Boone	3,188	$183,885,587
Mingo	1,454	$79,713,738
Kanawha	1,265	$78,266,580
Logan	1,116	$62,617,876
Marion	961	$63,818,402
Raleigh	957	$51,926,073
Wyoming	787	$42,326,057
McDowell	635	$30,295,205
Nicholas	529	$26,685,204
Harrison	402	$22,236,144

Source: West Virginia Bureau of Employment Programs, www.state.wv.us/bep

Given this strong linkage, it is likely that any temporal disruption in coal production will have discernible and predictable impacts on both the state and local economies. Absent any reliable information on the likely output impacts of Judge Goodwin's decision, it is impossible to accurately anticipate the magnitude of these effects. However, in order to illustrate the robustness of the relationship between coal mining activity and localized economic outcomes, Table 2 summarizes the effects of production reductions that range between 10 million and 40

million tons per year.[13] It must be emphasized that these values in no way represent predictions, but are provided to simple demonstrate the potential order of magnitude. It is also critical to note that, within the current setting, all impacts may be transitory in nature if production is undertaken at a later time.

As noted in our earlier work, the economic impacts of changed coal production volumes will have immediate and measurable impacts on the fiscal resources available to both the state and local (county) governments.[14]   Again, purely for illustrative purposes, the example developed above is extended to demonstrate the extent to which a twenty percent output reduction in the immediately affected counties would affect some of the more prominent revenue sources within those counties and across the state as a whole. These results are provided in Table 3.

Table 2
Economic Impacts of Reduced Coal Production

Reduction in Coal Output (tons, millions)	10	20	30	40
Employment Impacts (FTE's)	-3,797	-7,595	-11,392	-15,189
Income Impacts (millions 1999 dollars)	-168	-336	-504	-672
Output Impacts (millions 1999 dollars)	-585	-1,171	-1,756	-2,341

Table 3
Fiscal Impacts of Reduced Coal Production
(millions of 1999 dollars)

Reduction in Coal Output (tons, millions)	10	20	30	40
Coal Severance	-14.6	-29.2	-43.8	-58.4
Property Taxes (All Sources)	-14.4	-28.8	-43.2	-57.7
Sales and Use Tax	-4.9	-9.7	-14.6	-19.4
Personal Income Tax	-4.9	-9.9	-14.8	-19.7
Corporate Net Income Tax	-1.3	-2.7	-4.0	-5.4
Business Franchise Tax	-0.9	-1.8	-2.6	-3.5

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[13] These representative impacts were obtained by scaling the aggregated results of CBER's 2002 analysis.

[14] See Mark Burton, Michael Hicks and Cal Kent , *The Fiscal Implications of Judicially Imposed Surface Mining Restrictions in West Virginia.* Center for Business and Economic Research, February 2001, and by the same authors *Coal Production Forecasts and Economic Impact Simulations in Southern West Virginia*, Calvin Kent, Center for Business and Economic Research, Marshall University, June 2000.

Discussion Summary

Judge Goodwin's decision regarding Corps of Engineer permits for valley fills under Section 404(e) of the Clean Water Act is markedly different in nature than earlier federal court decisions that largely prohibited such fills. Nonetheless, to the extent that the Goodwin decision increases the necessary level of environmental review for permit applications, it still has the potential to measurably impact the state of West Virginia.

The magnitude of the Goodwin decision's economic impact depends on a number of factors including, but not necessarily limited to, future coal prices, changes in other inputs to the coal production process, the regulatory response of the US Army Corps of Engineers, and further judicial actions regarding existing 404(e) permits.

Publicly available data may be combined with advanced econometric techniques to estimate the impact of Judge Goodwin's ruling under any of the numerous plausible scenarios. Output impacts may then be translated into broader economic and fiscal effects through the use of simulation software and other already available economic models.

In short, policy-makers have the means to anticipate the overall effects of judicially mandated revisions to the valley fill permitting process within the state of West Virginia. Moreover, the currently elevated price of southern Appalachian coal adds an urgency to the need to develop this information. The potential losses to commerce and government revenues attributable to the elimination of 404(e) permits may not be easily recoverable if coal prices return to predicted levels.