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Disclaimers

The analysis and material presented herein reflect the views of the Principal Investigators and do not necessarily represent the position of the Lewis College of Business, Marshall University, or the West Virginia University Board of Trustees. The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the information presented herein.

Table of Contents

Table of Figures and Tables

Acknowledgments

Executive Summary

In June of 2000, Marshall University's Center for Business and Economic Research (CBER) released a nine-county study detailing the probable economic impacts of judicial decisions restricting the placements of valley fills in association with surface coal mining.1 In response to that study, the West Virginia Legislature's Joint Committee on Government and Finance commissioned a follow-up investigation. This subsequent research, summarized here, has had two principal aims. These include:

- Extend the original analysis of coal production effects and economic impacts to the entirety of West Virginia; and

- Estimate the extent to which the predicted economic impacts will affect the fiscal operations of municipal, county, and State governments.

The pursuit of these goals has consumed hundreds of research hours during which CBER faculty and staff carefully forecasted county-specific coal production levels under baseline conditions, as well as under the imposition of the valley fill restrictions ordered by Judge Charles Haden.[2] Coal production effects were translated into employment, income, and output changes through the use of regional simulation software and these results were then verified through the use of alternative software packages. Analysts treated the issue of possible out-migration and other potential changes that may affect the magnitude of demands for government services. Finally, the full slate of economic changes predicted under Judge Haden's decision was used to calculate changes in revenues and necessary government expenditures at both the local and State level.

The study team has received copious assistance and input from a wide array of individuals and entities, including but not limited to the West Virginia Department of Tax and Revenue, the West Virginia Division of Environmental Protection, the West Virginia Department of Transportation, the West Virginia Mining Association, the US Environmental Protection Agency, and the Appalachian Regional Commission. Readers should, however, understand that both the judgments expressed here, as well as responsibility for any errors, lie entirely with the study's authors.

Coal Production

Predicted State-wide coal production levels under both baseline conditions and a Haden decision implementation scenario are provided in Table E.1. The baseline conditions account for increased competition from international producers, the growing popularity of western domestic coal sources, and the initial impacts of electric utility restructuring – elements that have

[1] See Mark L. Burton, Michael J. Hicks, and Calvin A. Kent, "Coal Production Forecasts and Economic Impact Simulations in Southern West Virginia: A Special Report to the West Virginia Senate Finance Committee," Center for Business and Economic Research, Marshall University, June 2000.

[2] Bragg vs. Robertson. Civil Action 2:98-0636, U.S. District Court for Southern West Virginia, Charleston Division.

measurably softened the demand for southern Appalachian coal over the past 3-10 years. The production estimates do not reflect the more recent escalation of natural gas prices that has bolstered the prices of nearly every other alternative fuel source.

Table E.1
Predicted West Virginia Coal Production
(millions of tons)

	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Baseline Production	165.5	161.6	157.8	154.2	149.0
Production Under the Haden Phase-In	151.5	140.3	128.8	119.1	107.9
Policy-Induced Production Change	-14.0	-21.3	-29.0	-35.1	-41.1

The baseline forecast suggests a roughly two to four percent annual drop in Statewide coal production over the five year forecast period. The two percent value is roughly equal to recent region-wide forecasts released by the US Department of Energy's Energy Information Administration. Again, much depends on the extent to which currently observed increases in natural gas prices are transitory in nature.

Annual production declines under the Haden decision are much more substantial, falling into the 9 to 12 percent range. These predictions incorporate both the market forces evident in the baseline estimates and the effects of prohibiting valley fills in intermittent and perennial streams. The implementation scenario used to produce these estimates is the same as the "Phase-In" scenario employed in the June CBER study. Essentially, it is assumed that mines with active fill permits are allowed to continue to operate until those permits are exhausted. However, no further permitting of surface operations involving fills is allowed.[3] The scenario does not apply similar fill restrictions to underground operation, nor does it directly take into account those instances in which underground operations depend on surface mine permits. The analysis does, however, account for the effects of surface closures on the economics of satellite underground operations.

Economic Impacts

The economic impacts of more competitive fuel markets and the Haden decision regarding valley fills are summarized in Tables E.2 – E.4. County-specific values may be found in Chapter 4. The summary tables make two important points clear. First, the economic impacts of reduced coal production under the Haden decision will not be limited to coal producing counties. Of the more than 15,000 jobs lost by the fifth forecast year, 27 percent occur outside of coal producing counties. In terms of income losses, 15 percent of earnings declines come in counties that do not mine coal. Finally, 13 percent of the predicted $2.4 billion year-five decline

[3] The scenario also assumes a seven-year permit life. For a full description see CBER's June report, *supra* Note No. 1.

in aggregate economic output accrues to the State's non-coal producing regions. Thus, any suggestion that the economic impacts of reduced mining activity can be limited to coal producing counties is clearly in error. The current analysis cannot specifically point to the non-coal producing counties that will be affected by the predicted reduction in mining activity, but it is reasonable to assume that these declines will be observed in those non-coal counties with the larger populations and greater degrees of economic activity.

Table E.2
State-Wide Employment Losses Under the Haden Scenario

	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Coal Producing Counties	-3,870	-5,792	-7,794	-9,456	-11,432
Non-Coal Producing Counties	-1,224	-1,987	-2,755	-3,435	-4,147
State Total	**-5,094**	**-7,779**	**-10,549**	**-12,891**	**-15,579**

Table E.3
State-Wide Income Losses Under the Haden Scenario
(millions of 1999 dollars)

	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Coal Producing Counties	-194.8	-294.3	-397.5	-483.6	-584.1
Non-Coal Producing Counties	-30.5	-49.8	-69.1	-86.6	-105.0
State Total	**-225.3**	**-344.1**	**-466.6**	**-570.2**	**-689.1**

Table E.4
State-Wide Output Losses Under the Haden Scenario
(millions of 1999 dollars)

	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Coal Producing Counties	-709	-1,073	-1,449	-1,764	-2,131
Non-Coal Producing Counties	-95	-155	-216	-271	-329
State Total	**-804**	**-1,228**	**-1,665**	**-2,035**	**-2,460**

The second point that may be inferred from the summary tables is that the magnitude of the predicted five-year reduction in coal related economic activity is significant. There are many

ways to measure the overall importance of reduced mining activities. The simplest is to consider the value of the $2.4 billion output reduction relative to remaining aggregate State activity. This calculation reveals that the predicted loss represents roughly four percent of current State-wide economic activity.

Estimates of economic impacts were developed through the application of IMPLAN simulation software distributed by MIG, Inc. The IMPLAN software was specifically chosen in order to obtain county-specific values. However, it should also be noted that aggregated IMPLAN results were compared to estimates obtained through the use of the *dynamic* simulation software produced by Regional Economic Models, Inc (REMI). These two competing modeling systems yielded nearly identical results. Similarly, the CBER coal production forecast and the REMI coal production forecast differed by less than one half a percent through each of the forecast years. This considerably strengthens the confidence in both projections.

Migration and the Demand for Government Services

Typically the impacts of diminished economic activity include countervailing forces that help balance out the overall effect on the demand for government services. On the one hand, economic distress typically leads to greater levels of public support in the form of increased transfer payments to households, but this effect is often partially neutralized by the out-migration of displaced workers and their families. Thus, the demand for government services may be largely unchanged. Indeed, the REMI simulation software referenced above predicts a roughly 1,500-person decline in State population in response to reductions in coal-related economic activity. However, independent CBER population forecasts suggest that the REMI estimates may significantly overstate the out-migration that results from the Haden decision.

There are, in fact, several reasons for this outcome. Primarily, the significant out-migration from coal producing counties that occurred in the 1980's largely drained those counties of potential migrants who can respond to economic distress by migrating toward opportunities elsewhere. Mobility is largely a function of age, education, and family size. Very simply put, a relatively large percentage of the young, educated, and single workers who could migrate in response a downturn in economic fortunes have already done so or are doing so now. This is particularly true of those directly employed within the mining industry. Ultimately, the study team opted to use the CBER migration estimates. As a consequence, there are modest, but observable, increases in the demand for government services. Readers should note that the analysis *does not* conclude that currently observed out-migration will subside over the forecast period, only that the rate of out-migration will not increase as a result of the Haden decision.

Predicted job losses, in combination with very little out-migration, suggest that the State's unemployment rate will increase by one to two percent during the early years after the Haden decision's implementation. This will measurably increase the demand for State unemployment compensation. Moreover, the amount of increased demand may be sufficient to temporarily threaten the solvency of this program. However, as job losses continue in later forecast years, those who became unemployed early in the process will begin to exhaust unemployment benefits, so that the general state of the unemployment insurance fund is not predicted to worsen. Just as with unemployment benefits, the study also predicts a modest

increase in the number of TANF and Medicaid recipients. Again, however, the magnitude of the increase is not like to significantly impact the resources necessary to fund these programs.

Predicted Revenue Impacts and Fiscal Challenges

Municipal, county and State funding mechanisms are inexorably tied to the State's economy and to each other through a complex system of statutory and economic relationships. The challenge inherent in the current analysis was to retain enough of that complexity to ensure valid results, while simplifying things as much as possible for the sake of tractability. To these concerns was added an additional desire to produce predicted revenue impacts that err in the direction of the conservative if they err at all. In this sense, the revenue impacts reported here represent a "best case" outcome. Ultimately, the set of revenues treated within the current analysis included:

- Municipal and county operating property taxes directly attributable to coal production
- Municipal and county excess levies (including, but not limited to education) directly attributable to coal production
- State educational property taxes directly attributable to coal production
- Coal Severance Tax distributions to coal producing counties
- Coal Severance Tax distributions to non-coal producing municipalities and counties
- Coal Severance Tax revenues retained by the State
- State Corporate Net Income Tax revenues (all industries)
- State Business Franchise Tax revenues (all industries)
- State Sales and Use Tax revenues (both industries and households)
- State Personal Income Tax revenues

Clearly, however, there are additional revenue sources that will be affected by the predicted reduction in coal-related economic activity. The revenue impacts under the Haden decision for those included revenue sources are summarized in Table E.5. Revenue losses of this magnitude will likely pose fiscal challenges for both local and State policy-makers. However, before moving forward into a more explicit discussion of these challenges, it is wise to note several qualifications that apply to the values developed in Table E.5. First, as stated, there will almost certainly be revenue impacts that extend beyond those depicted by these data. It would not be imprudent for policy makers to anticipate a three – five percent decline in other revenue sources. Second, the revenue losses predicted here are strictly attributable to declines in coal-related economic activity. Any changes to other economic sectors or to the aggregate State economy as a whole could easily exacerbate or mitigate the revenue losses depicted here. Finally, readers must understand that the revenue losses tallied in Table E.5 reflect the effects of *both* heightened competition in fuel markets and the impact of the Haden decision. Roughly 68 percent of the revenue declines are exclusively traceable to restrictions on valley fills, while approximately 32 percent of the year-five revenue decline (approximately $35 million) may be expected under any circumstance.

Table E.5
State-Wide Revenue Losses Under the Haden Scenario
(millions of 1999 dollars)

	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Coal Severance	-19.298	-29.562	-40.239	-49.380	-59.921
Property Taxes (all sources)	3.455	-13.434	-31.332	-46.215	-59.107
Sales and Use Tax	-6.534	-9.978	-13.532	-16.536	-19.985
Personal Income Tax	-6.602	-10.082	-13.672	-16.707	-20.191
Corporate Net Income Tax	-1.803	-2.753	-3.733	-4.562	-5.513
Business Franchise Tax	-1.194	-1.823	-2.472	-3.021	-3.651
Total – All Sources	**-31.975**	**-67.632**	**-104.980**	**-136.421**	**-168.368**

County Fiscal Challenges

Table E.6 summarizes the revenue losses faced by county governments across the State.[4] County-specific values are provided in the main text and appendixes. Several issues are worth noting. First, the "School Funding" line in the county data includes only revenues from excess levies. It is the study team's judgment that basic public school funding is a State obligation. Consequently, revenue losses from the Education Property Tax are reflected in the State tally. Second, the aggregation obscures the severe impacts on many coal-producing counties. To the extent that some individual coal producing counties rely heavily on Coal Severance Tax revenues and coal-related property tax revenues (both operating and excess), the distribution of the predicted distress is, by no means, uniform. In fact, it is possible that the most coal-dependent counties will find it difficult to fund even the most essential governmental services.

Table E.6
State-Wide County Revenue Losses Under the Haden Scenario
(millions of 1999 dollars)

	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*
School Funding Impacts	0.3	-5.5	-12.0	-17.3	-21.8
Other County Revenue Impacts	-12.7	-25.2	-38.2	-49.2	-60.8
Total County Revenue Impacts	**-12.4**	**-30.7**	**-50.2**	**-66.5**	**-82.6**

[4] The revenue values presented in Tables E.6 and E.7 sum to less than the values indicated in Table E.5. The difference is largely attributable to Coal Severance Tax distributions to municipalities and Coal Severance Tax revenues retained by the State.

State Fiscal Challenges

Table E.7 summarizes the predicted revenue losses to the State of West Virginia over the five year forecast period. The school funding impacts owe to declines in educational property tax collections, while the other revenue declines are attributable to revenue losses through the State tax revenue instruments included within the current analysis.

Table E.7
State-Wide County Revenue Losses Under the Haden Scenario
(millions of 1999 dollars)

	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*
School Funding Impacts	1.3	-5.4	-11.7	-17.0	-21.6
Other State Revenue Impacts	-18.5	-28.1	-38.1	-46.5	-56.3
Total State Revenue Impacts	**-17.2**	**-33.5**	**-49.8**	**-63.5**	**-77.9**

Study Conclusions

At the time of this report, it is unclear whether or not Judge Haden's decision will be upheld. If it is, the result will be significant reductions in coal production, the loss of thousands of jobs and hundreds of millions of dollars in income across the whole of West Virginia.

While there remains considerable uncertainty regarding the timing and extent of revisions in mine permitting practices under the Haden decision, the nature and scope of the resulting fiscal impacts are discernable. Chapter 7 summarizes these as follows:

- Implementation of the Haden decision and the consequent reduction in economic activity will generate an aggregate revenue loss across jurisdictions of more than $168 million per year within five years of implementation.

- Again, within five years the State property tax revenues used to fund public education will fall by more than $21 million on an annual basis. This will force the State to divert other funds in order to discharge this obligation. Additionally, aggregate annual county property tax revenues for public school funding through excess levies will decrease by a similar amount ($21.8 million)

- Revenues generated from the State funding sources considered here (CNIT, BFT, PIT, Sales and Use, etc.) will decline by an estimated $6 to $13 million annually if the Haden decision is implemented, so that by year five, annual revenue losses will exceed $77 million.

- Very little out-migration is likely to result from the economic outcomes associated with reduced mining activity. Thus, there is likely to be a small but measurable *increase* in the demand for government services

- Counties that rely on coal severance revenues or property taxes that are dependent on a coal-related base will be particularly hard hit by any policy-related reduction in coal production. This conclusion extends to educational expenditures that are funded through excess levies.

- All counties and municipalities will see measurable declines in available revenues owing to reductions in available Severance tax revenues.

- If the State does not actively support municipal and county governments by ensuring that these local governments are able to discharge bond obligations, the ability to secure future bonding will be severely damaged on a State-wide basis.

In summary, the implementation of the Haden decision will squeeze State fiscal resources from a number of directions. Municipal and county governments, themselves pressed for revenue, will likely look for relief from the State. The traditional resources for mandatory school funding will be measurably diminished, and the demand for support services in the form of Medicaid and TANF payments will increase. At the same time, revenues from other tax instruments will also be adversely affected, so that the State's ability to respond to new demands for assistance will be diminished. Finally, even the credit of the State and its ability to borrow against future prosperity may be damaged if it is not able to protect the credit worthiness of counties and municipalities.

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Chapter 1 - Introduction and Motivation

Introduction

It is impossible to explain the evolution and current status of West Virginia's economy without accounting for the influence of coal mining. For decades the production, preparation, and transportation of coal dominated the State's commercial landscape. Even after pronounced efforts to diversify the scope of economic pursuits, mining and its related activities still account for between 10 and 20 percent of West Virginia's overall commerce.[5] Accordingly, it is not surprising that approximately 10 percent of State tax revenues are directly or indirectly tied to coal mining activities.

In 1999, Judge Charles Haden issued a restraining order prohibiting the valley fills that are necessary to many forms of surface coal mining.[6] The Haden decision, if upheld, will significantly reduce the volume of West Virginia coal produced each year. In turn, the associated reduction in economic activity will impact both the demand for State and local services and the ability to fund these services. It is within this context that the West Virginia Legislature's Joint Committee on Government and Finance commissioned the current analysis.

The balance of the investigation reported here carefully quantifies the probable fiscal impacts of further restrictions on surface mining methods in West Virginia. It begins by extending earlier estimates of policy-induced declines in coal production to include the whole of West Virginia. These production losses are then used to project probable private-sector changes in employment, incomes, and output. The current methodology also considers the possibility of increased out-migration as a result of declining economic activity. Finally, the projected economic and demographic changes predicted under the Haden decision are used to estimate likely changes in State and local tax collections, as well as corresponding changes in the demand for government services.

The Contribution of Previous Research

The methodologies employed in the current analysis draw heavily from two previous Center for Business and Economic Research (CBER) studies. In the Spring of 2000, at the request of State Senator Oshel Craigo, CBER estimated the economic effects of Judge Haden's decision on nine coal producing counties in southern West Virginia.[7]

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[5] Estimates generated within the current study suggest that 8.6 percent of statewide employment, 14.5 percent of all incomes, and 23 percent of Gross State Product are directly or indirectly tied to/induced by coal mining.

[6] Bragg vs. Robertson. Civil Action 2:98-0636, U.S. District Court for Southern West Virginia, Charleston Division.

[7] See Mark L. Burton, Michael J. Hicks, and Calvin A. Kent, "Coal Production Forecasts and Economic Impact Simulations in Southern West Virginia: A Special Report to the West Virginia Senate Finance Committee," Center for Business and Economic Research, Marshall University, June 2000.

Both the methodology and conclusions of this initial study were subjected to considerable scrutiny, yet both were found to be entirely defensible.[8] Consequently, the methods of forecasting future coal production developed during this earlier effort are retained here. CBER was also responsible for forecasting probable economic impacts that would result from modifications to the State's system of taxes proposed by the Governor's Commission on Fair Taxation. In the course of its tax modeling, CBER faculty and staff developed numerous methods for capturing the linkages between changing economic activity and the magnitude of State and local tax collections.[9] As in the case of coal forecasts, the analytical techniques used within the tax research were the subject of considerable academic discussion. Again, however, both CBER's methods and analytical conclusions were judged to be appropriate.[10]

Scope and Vantage of the Current Analysis

As with most economic analyses, the findings of the current research must be accepted within the context of the analytical framework in which they were developed. For example, the current study, at the direction of the State Legislature, is anchored in the short-run. Very clearly, there are longer-term implications of further restrictions on surface mining methods. However, it is the short-run economic and fiscal impacts that are most likely to vex policy-makers. Hence, the short-run impacts are the focus here.

Similarly, the current analysis is restricted to the direct economic and fiscal impacts of reduced coal production. Surface mining imposes "external" costs on the communities that surround these operations and on the State as a whole. Whether or not the mining industry is held sufficiently accountable for these costs continues to be an area of significant debate. However, measuring the magnitude of the "external" costs stemming from surface mining is well beyond the scope of the current research. The CBER's charge is to provide West Virginia policy-makers with tools that will help them anticipate foreseeable fiscal challenges. Within this context, addressing the nature or magnitude of "external" costs is not necessary.

Finally, the methods and assumptions described here are, by design, highly conservative. When it became necessary to choose between competing assumptions or restrictions, the study team opted for the course that would produce the least dramatic result. For example, many onlookers urged the team to include the impact of restricting the fills and impoundments needed to sustain underground mining operations. Judge Haden's decision clearly indicates that these structures may be in violation of the Clean

[8] See Bowling, Brian. "Coal Industry Touts Study," *Charleston Daily Mail*. June 14, 2000.

[9] See Burton, Mark L. "The Projected Economic Impacts of West Virginia's Agenda for Fair Taxation: Revised Preliminary Estimates." Center for Business and Economic Research, Marshall University, January 1999.

[10] Indeed, the analytical approach developed by CBER in its tax research has been favorably cited by the Federation of Tax Administrators and by *State Tax Notes*.

Water Act.[11] However, because there is no formal legal ruling to this effect, CBER declined to include these impacts within the current study. Similarly, it is probable that declines in economic activity will adversely impact housing prices. This will, in turn, place further downward pressure on property tax collections. However, these effects were judged to be modest in comparison with other fiscal impacts and were, therefore, ignored. This general desire to produce a conservative, defensible set of estimates is evident throughout the study.

[11] Bragg vs. Robertson. Civil Action 2:98-0636, U.S. District Court for Southern West Virginia, Charleston Division.

Chapter 2 - Baseline Fiscal Conditions

In order to understand the potential impacts of the Haden decision on West Virginia's fiscal circumstance, it is first useful to describe the current fiscal setting and the baseline budgetary conditions that may be expected, even if the Judge's ruling is set aside.

State Revenues

Taxes and fees collected in West Virginia are deposited into several funds that are subject to direct appropriation by the legislature. These funds finance current operations and infrastructure construction. They include:

- General Revenue Fund
- State Road Fund
- Lottery Funds
- Federal Funds
- Special Revenue Funds

For fiscal year 1999, total gross receipts for all funds equaled approximately $8.734 billion[12]. Of this amount, $4.213 billion was collected through direct taxes in the State.[13] The balance resulted from various other sources, including the State lottery and federal transfers, among others. Thus, it is clear that the State's ability to fund necessary services is directly tied to its ability to generate revenues from the various available tax instruments.

West Virginia's Tax Instruments

Generally, West Virginia's taxes can be grouped within four broad categories. These categories include: business taxes, consumer and use taxes, personal taxes, and property taxes. Following is a brief description of each tax category and the specific taxes that constitute that category.

Business Taxes

Taxes are levied on businesses both when they initially begin operation in the State and then annually thereafter. The State also taxes the gross receipts (or outputs) and profits of many business sectors. Some of the more important business taxes include:

> Corporate Net Income Tax (CNIT): A tax on profits levied against corporate net income of both foreign and domestic firms that conduct business or derive income from property, activity, or other sources in West Virginia. The current CNIT rate is nine percent, one of the higher rates for profits taxes in the United States.

[12] From Table 3, "Gross Receipts of All State Funds," *1999 Statistical Handbook*, pg. 10. West Virginia Research League.
[13] Data obtained from Chief Inspector's Office of the West Virginia Department of Tax & Revenue. Calculations performed by the CBER.

Business Franchise Tax (BFT): A business tax levied against a firm's equity for the privilege of doing business in the State of West Virginia. All corporations (whether foreign or domestic), all S corporations, and all partnerships conducting business in the State are subject to this tax.

Property Taxes Paid by Businesses: Like households, West Virginia Businesses pay both real and personal property taxes. However, unlike most states, the business personal property tax base includes both equipment and inventories. Real and personal property taxes also primarily fund education, just like the taxes collected from private citizens.

Severance Tax: A gross receipts tax levied against businesses that "sever", extract, and/or produce natural resource products in West Virginia. This tax is also levied against businesses that engage in the processing and/or treatment of natural resource products during that production process of their goods.

State Business and Occupation Tax (B&O): A tax levied exclusively against public utilities. Prior to July 1, 1987, this tax was imposed upon all business activities in the State. Taxes are levied against the gross revenues of these firms at rates generally ranging from 3 to 4.5 percent. Electric power producers are taxed based upon their average annual generating capacity. Electric power distributors generally pay a unit tax on distribution. In contrast, local telecommunications providers pay a separate gross receipts tax for services that are not subject to effective competition.

Health Care Provider Tax: A gross receipts tax levied against providers of 16 specific types of health care services. This tax was enacted so that the State can match federal medical funding. Taxation rates for these services vary from 1.75 percent to 5.5 percent, depending upon the particular service.

Much of the State's business tax revenue comes from a few specific taxes. In 1999, the B&O tax collected $182.61 million, while the CNIT generated $167.69 million, and the Severance tax collected $191.7 million.[14] Another $8.25 million was collected for the Special Reclamation Fund. The West Virginia Privilege Tax brought in $155.60 million for the State Road Fund, while BFT collections for the General Revenue Fund equaled $95.43 million.[15] Other significant business tax instruments include:

- Health Care Provider Tax (Medicaid State Share Fund) ($134.9 million)
- Business Regulation Fees ($2.35 million)
- Corp. License and Attorney-in-fact Fee (Charter Tax) ($5.06 million)
- Telecommunications Tax ($13.84 million)
- Insurance Taxes and Fees ($63.4 million)

In addition to the business-specific taxes described within this subsection, it should be noted that West Virginia's businesses pay significant sums under more general

[14] These severance tax collections included $148.4 million for the general fund, $3.2 million for the Timber Severance Fund, $24 million for the State's Infrastructure Fund and $16.1 for Severance Tax/Local Distribution Fund.

[15] All tax revenue/collection information in this chapter was provided by the West Virginia Department of Tax and Revenue.

tax instruments described below, including the Sales and Use tax and specific excise taxes.

Consumer Sales and Use Taxes

A variety of consumer goods and services are subject to a uniform sales tax. Sales taxes are collected based upon a bracketed system that ranges from one to six cents of tax per each $0 to $1 dollar of purchase (as opposed to a strict six percent rate). Certain items and services are strictly exempt from sales taxes, while others are exempt if the purchaser holds a current certificate of exemption. Other purchasers are eligible to obtain sales tax refunds or credits after purchasing non-exempt items when no certificate of exemption is available.

For Fiscal Year 1999, West Virginia's Consumer Sales Tax collections exceeded $851.8 million ($829 million to the General Fund, as well as $22.8 million to the School Major Improvement and School Construction funds). The State collected an additional $68.17 million from its Use Tax, $7.88 million from the Beer Tax & Licenses, and $33.08 from the Cigarette Tax. The Soft Drink Tax generated another $12.85 million.

Selective Sales and Excise Taxes

West Virginia levies a variety of sales and excise taxes. Together, these taxes are significant contributors to the State's budget, especially to its Road Fund. Among these taxes are the Gasoline/Motor Carrier Tax, the Gasoline Sales Tax, the Privilege Tax, and License and Registration Fees. In 1999, the Gasoline/Motor Carrier Tax generated revenues of $227.08 million for the State Road Fund, while the Gasoline Sales Tax collected $68.78 million and the Privilege Tax garnered $143.51 million. License and Registration fees added another $79.79 million.

Licenses and Fees

West Virginia requires licenses and fees for a variety of activities. With the exception of the previously mentioned licenses and fees related to the State Road Fund, these licenses are generally not very large revenue generators. A list of other State licenses and fees, as well as their reported FY 1999 collections, follows:

- Solid Waste Fund ($12.35 million)
- Bingo/Raffle Investigation ($1.35 million)
- Racing Fees ($3.0 million)
- Collection Agency Clearing ($0.62 million)
- Cemetery Company Registration ($21.6 thousand)
- Wine License ($6.7 thousand)
- Transient Vendor License ($6.5 thousand)
- Drug Paraphernalia License ($1.0 thousand)

Personal Taxes

West Virginia's system of taxation includes only two personal taxes, but these generate much of the State's tax revenue. In fact, the State's largest single tax is the Personal Income Tax, which generated $919.89 million dollars in FY 1999. The State's other personal tax, its Estate and Inheritance Tax, collected $27.33 million dollars that year. Together, the two personal taxes accounted for $947.21 million of the State's 1999 revenue.

West Virginia's personal income tax is one of the simplest in the nation, mostly because it allows very few itemized deductions and a scarcity of available credits. However, the tax is clearly progressive, as is illustrated by the fact that filers with less than $32,000 in income filed 66 percent of 1996 West Virginia tax returns, but paid only 20 percent of total personal income taxes collected for that year.

Property Taxes

West Virginia levies three property taxes: the Real Property Tax, the Personal Property Tax, and the Property Transfer Tax. The majority of the revenue raised by these taxes is used to fund education. In 1999, the State's Property Tax generated $838.81 million.

There are four general classes into which all real and personal property falls. For tax purposes, these categories are used to segregate agricultural, residential, and commercial property. Property assessments are equal to 60 percent of the estimated value of the property, or in other words, the value the property would be expected to bring in a market transaction.

The State Legislature sets a maximum property levy rate for education. However, counties and municipalities can choose their own property levy rates, as long as these rates fall below the State's constitutionally prescribed maximums. County property tax rates can exceed the State-set levels by passing excess levies.

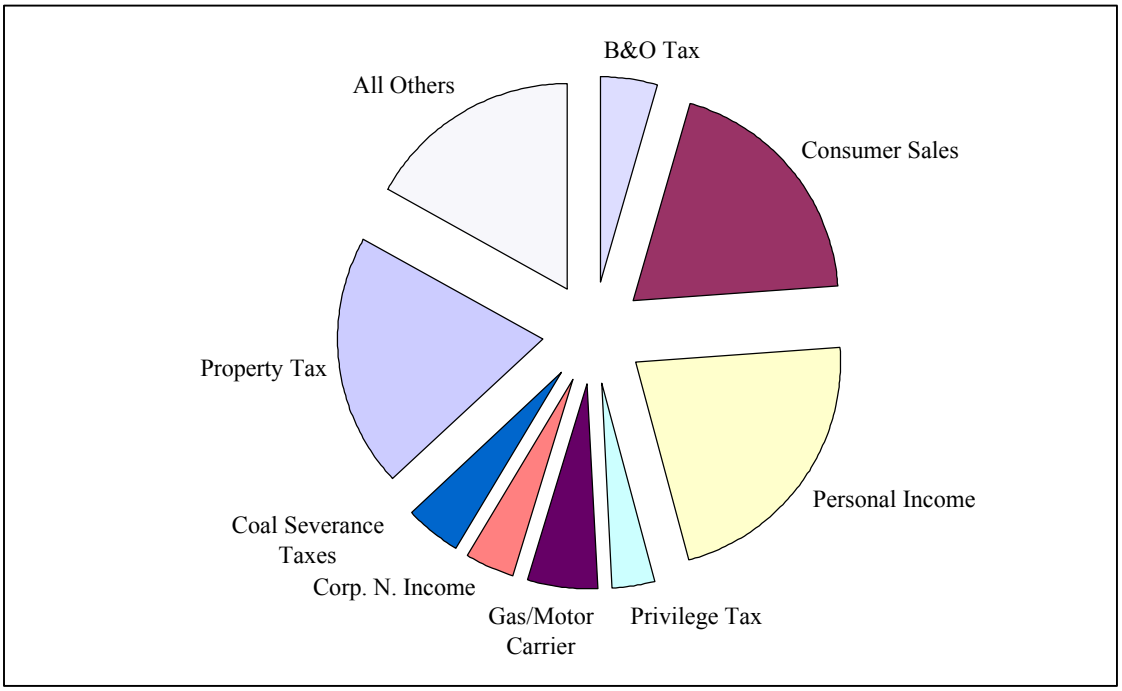
A Summary of Tax Revenues

As Figure 2.1 illustrates, three taxes generated the majority of the State's revenue during Fiscal Year 1999 – the Personal Income Tax (21.84%), the Consumer Sales Tax (19.68%), and Property Taxes (19.91%). Several other taxes generated significant tax revenue. These included: the Gasoline/Motor Carrier Tax (5.39%), the various Coal Severance Taxes (4.46%)[16], the Business and Occupation Tax (4.34%), the Corporate Net

[16] Please note that the tax revenue documentation received from the West Virginia Department of Tax and Revenue included entries for Severance Tax revenues that were placed into three different State funds, the State's General Fund, the Infrastructure Fund, and the Severance Tax – Local Distribution Fund.

Income Tax (3.96%), and the Privilege Tax (3.42%). The remainder of the State's tax revenue (19.43%) was generated by a variety of other smaller taxes.[17]

Figure 2.1
Revenues by Source



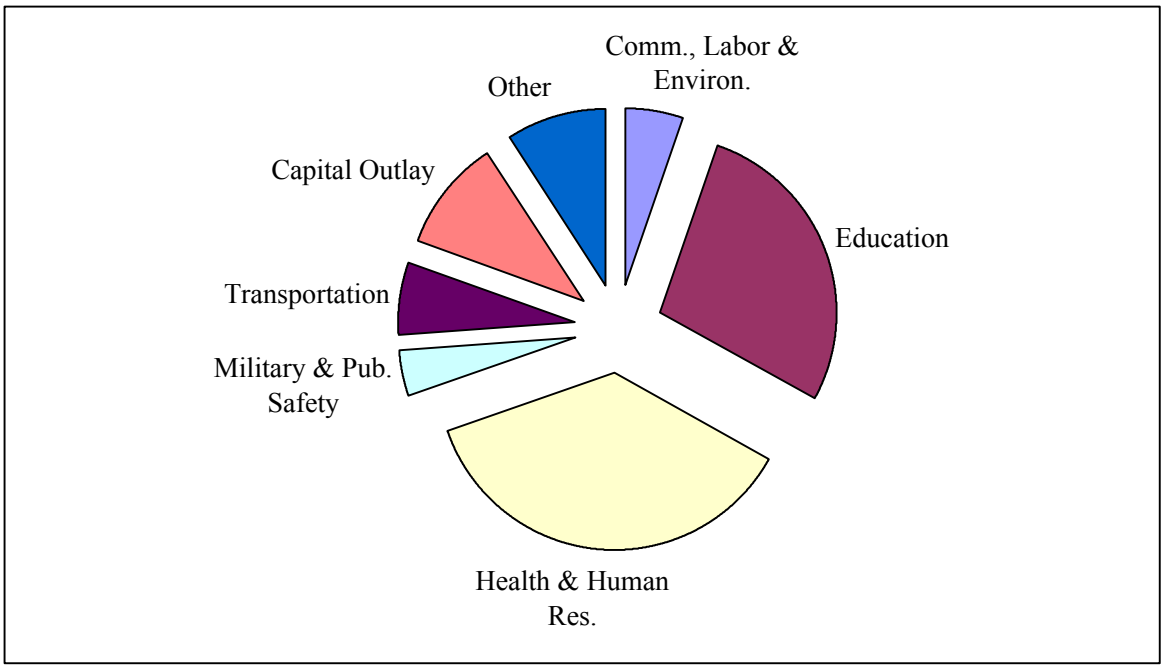
Expenditures by Function

As Figure 2.2 illustrates, the State of West Virginia spent more in FY 1999 on Health and Human Resources (36.65%) than on any other single area of its budget. In fact, the State spent almost nine percent less on the next largest budget area, Education. Other areas of significant expenditure included: Capital Outlay (10.39%), Transportation (6.76%), Commerce, Labor & Environmental Resources (5.24%), and Military & Public Safety (3.94%). All other areas of expenditure equaled a little over nine percent.

Roughly 75 percent of the State's funding for current operations and infrastructure construction depends heavily upon revenue sources drawn from economic activity and property in the State. Unanticipated fluctuations in these revenue sources make matching the needs of the State's citizens with available resources more difficult.

[17] These numbers are based upon information received from the West Virginia Department of Tax and Revenue. Calculations were made by Marshall University's Center for Business and Economic Research.

Figure 2.2
Expenditure by Function



Local Government Financing

Much like the State government, county and municipal governments have a variety of funding mechanisms. In some instances, these revenue-generating vehicles are relatively insulated from coal-related changes in economic activity. In many cases, however, they are not. Thus, a significant reduction in coal-related commerce would very clearly challenge the fiscal well-being of many local governments.

There are three principal sources of funding at the county level – a county operations property tax, coal severance tax revenues, and excess property tax levies. County excess levies are found in three coal-producing counties (Wayne, Kanawha, and Lincoln) and 18 additional counties statewide. West Virginia State Code §11-13A-6 provides that coal-producing counties receive 75 percent of locally generated coal severance tax revenues. Finally, all counties and municipalities receive a portion of the 25 percent of coal severance revenues retained by the State. These latter distributions are based on population.

The funding mechanisms available to municipal governments are similar. Municipal governments levy property taxes and may also impose excess property tax levies. Statewide, 54 municipalities assess excess levies and four municipalities impose bond levies. Municipalities also have the option of imposing a Business and Occupation (B&O) tax against gross firm receipts. Currently, 136 municipalities use this tax.[18]

[18] These numbers are based upon information received from the West Virginia Department of Tax and Revenue.

Importantly, within the current context, all municipalities also receive a portion of the 25 percent of severance tax revenues retained by the State. Again, this distribution is based purely on population. Finally, municipalities have the option of imposing user charges or fees for services provided.

School Funding

The State of West Virginia is responsible for funding public education for grades K-12. Revenues for this purpose are derived from county-level property taxes. Revenues from the education property tax are returned directly to the State, which then redistributes them to county school boards based on a complex school funding formula.[19] Additionally, like county and municipal governments, school boards can seek county-level excess property tax levies. In Tax Year 1999, 43 counties had school excess levies and 25 counties had school bonds statewide. Coal-producing counties accounted for 21 of the counties with school excess levies and nine of the counties with school bonds.

Baseline Fiscal Stability

Even absent the potential impacts of additional restrictions on surface mining methods, State policy-makers will likely face a number of significant fiscal challenges over the foreseeable future. These include: (1) a slowing national economy, (2) extremely volatile fuel and energy markets, (3) fiscal distress in several important municipal governments, and (4) the continued erosion of the State's commercial tax base. Readers must recognize, however, that the current analysis does not account for these potential challenges. The baseline fiscal conditions referenced in the current analysis only reflect predicted changes in coal-related economic activity.

Fiscal Structure and the Current Analysis

As the preceding text suggests, State and local finance in West Virginia is characterized by a complex set of interrelationships, both in the development of revenues and in the discharge of fiscal responsibilities. In order to keep the balance of the current analysis tractable, it was necessary to simplify these relationships as much as possible within the modeling process. At the same time, it was equally important to retain more complex fiscal relationships when the revenues or spending in question are likely to be heavily impacted by declines in coal-related economic activity. Accordingly, several important State revenue sources such as the Health Care Provider tax and the Automobile Privilege tax were excluded from the study, not because they are unimportant, but because the revenues these instruments generate appear to be relatively safe from coal-related declines in commerce.[20] The set of tax instruments considered here includes:

[19] Appendix E describes the school funding formula.

[20] The term "relatively" is important. We certainly are not asserting that revenues from other tax instruments will be unaffected by reductions in coal-related commerce. However, it was the study team's judgement that the revenue losses associated with the omitted tax instruments will be small relative to the revenue losses from the included taxes.

- The State Severance Tax
- The Corporate Net Income Tax
- The Business Franchise Tax
- Coal-Related Real and Personal Property Taxes
- Sales and Use Taxes
- The State Personal Income Tax

Readers should note that the conservative decision to restrict the set of revenue sources considered within the remainder of the analysis necessarily understates the Haden decision's potential fiscal impacts.

Chapter 3 - Coal Production Forecasts

As previously noted, CBER developed a novel yet defensible method of estimating county-specific levels of coal production within the course of a nine-county study released in June of 2000. This same method was used to generate production forecasts for every coal-producing county in West Virginia. The full forecast methodology is described in Appendix D.

Baseline Forecasts

The volume of coal mined in West Virginia during any particular year is a function of many factors that define both the demand and supply sides of fuel markets.[21] Currently, coal production volumes are influenced by the availability of low-sulfur western coal, the need to further suppress pollutant emission levels, the restructuring of the electric utility industry, existing mining practice restrictions, and a surge of foreign competition in both export and domestic markets. In the long-run, these market forces are joined by a nearly continuous growth in the demand for electricity and productivity improvements that allow mining firms to sell at ever-lower prices. In order to effectively capture the effects of the Haden decision on coal production, it was first necessary to develop a forecasting model that effectively accounts for these market forces.

Table 3.1 summarizes the revised baseline coal production forecasts for 2001-2005. Several important points are worthy of note. First, the 1999 predicted total volume from the earlier study provided an exceptionally close forecast of production with an under forecast error of less than 1.5 percent. Additionally, this forecast deviates less than one half percent per year from the REMI generated coal production forecast. The CBER and REMI five-year coal production forecasts are depicted in Figure 3.1. Second, the forecasts suggest that output for some counties will increase. This is consistent with the placement of new mines in these counties. Third, these forecasts were generated based on data observed prior to the rapid escalation in natural gas prices that occurred during the latter half of 2000.[22] Finally, in terms of evaluating the Haden decision's impacts on fiscal conditions within the State, it is the *differences* between baseline values and values generated under the Haden decision that is most important.[23]

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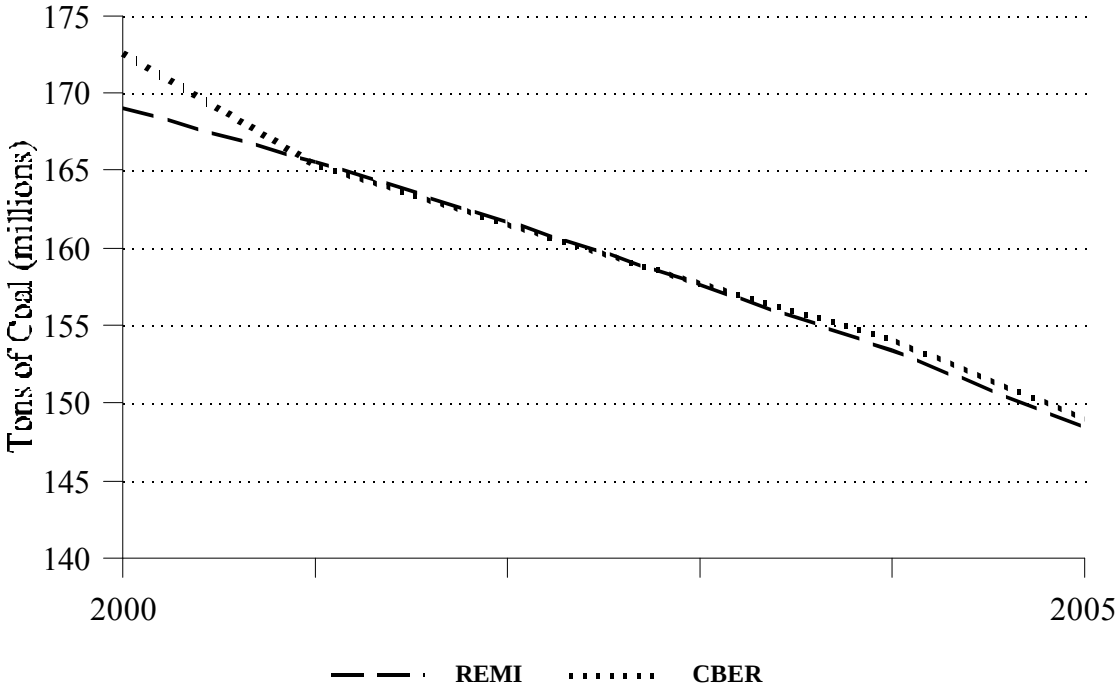
[21] For a full description of the market forces that are currently impacting fuel markets, see Mark L. Burton, Michael J. Hicks, and Calvin A. Kent, "Coal Production Forecasts and Economic Impact Simulations in Southern West Virginia: A Special Report to the Senate Finance Committee," Center for Business and Economic Research, Marshall University, June 2000.

[22] See McCullough, Robert "Price spike Tsunami: How market power soaked California." *Public Utilities Fortnightly,* January 1, 2001.

[23] The baseline forecast volumes exhibit a downward pattern that is measurably more pronounced than the decline depicted by Energy Information Administration forecasts (See "Annual Energy Outlook 2001 with Projections to 2020," Report # DOE/EIA-0383 (2001), US Department of Energy, Energy Information Administration, Washington, DC, December 22, 2000). There are several reasons for this difference. First, as noted above, the CBER forecasts were generated in advance of the significant increase in natural gas

Figure 3.1, A Comparison of Coal Production Forecasts
(REMI Baseline and CBER County level production aggregated to State level)



prices. As importantly, the EIA forecasts assume a stable export share for US producers even though exports fell by more than 25 percent between 1998 and 1999. CBER makes no such assumption.

Table 3.1
Forecasted Baseline Coal Production

County	*2000 Estimate*	*2001*	*2002*	*2003*	*2004*	*2005*
Barbour	801,732	753,432	706,232	660,132	615,132	571,132
Boone	32,396,763	31,894,563	31,400,763	30,915,163	30,437,663	29,968,163
Braxton	1,247,125	1,212,425	1,178,525	1,145,425	1,113,125	1,081,525
Brooke	1,905,825	1,838,925	1,773,525	1,709,625	1,647,225	1,586,225
Clay	5,768,916	5,544,716	5,325,716	5,111,716	4,902,616	4,698,316
Fayette	4,186,356	4,191,056	4,195,756	4,200,456	4,205,156	4,113,356
Grant	747,267	704,767	663,267	622,767	583,167	544,467
Greenbrier	562,909	544,009	525,509	507,409	489,709	472,409
Harrison	7,377,285	7,143,185	6,914,485	6,691,085	6,472,785	6,259,485
Kanawha	14,931,951	14,977,051	15,022,251	15,067,551	15,113,051	14,426,751
Lincoln	2,511,580	2,496,180	2,481,180	2,466,480	2,452,080	2,437,980
Logan	8,498,375	5,200,575	5,013,075	4,830,775	4,653,375	4,480,875
Marshall	11,149,583	10,759,583	10,378,583	10,006,383	9,642,783	9,287,583
McDowell	4,419,573	4,291,773	4,167,473	4,046,573	3,928,973	3,814,573
Mineral	43,672	40,472	37,372	34,372	31,472	28,672
Mingo	22,041,012	21,068,812	20,143,412	19,262,412	18,423,812	17,625,512
Monongalia	11,807,680	11,432,180	11,065,280	10,706,780	10,356,480	10,014,280
Nicholas	5,201,157	5,098,650	5,000,750	4,907,250	4,817,950	4,732,650
Preston	1,238,321	1,182,421	1,127,821	1,074,521	1,022,421	971,521
Raleigh	10,369,771	10,622,071	10,880,371	11,144,771	11,415,371	10,888,871
Tucker	145,396	139,296	133,296	127,396	121,596	115,896
Upshur	2,920,730	2,836,130	2,753,430	2,672,630	2,593,730	2,516,630
Wayne	7,543,061	7,282,161	7,027,261	6,778,261	6,534,961	6,297,261
Webster	4,709,048	4,564,648	4,423,548	4,285,648	4,150,948	4,019,348
Wyoming	10,092,981	9,643,281	9,213,781	8,803,681	8,411,981	8,037,981
TOTAL	**172,650,266**	**165,462,363**	**161,552,663**	**157,779,263**	**154,137,563**	**148,991,463**

The Phase-In Decision Scenario

At this juncture, it is difficult to anticipate precisely how the Haden decision will be implemented if it is upheld. In fact, there are any number of plausible scenarios. This range of possibilities is generally bracketed by two possible implementation schemes representing the extremes. Under the first of these boundary scenarios, mines with permits for valley fills that violate Judge Haden's decision would be allowed to continue operations until current permits expire. However, new permits for fills that interfere with intermittent or perennial streams would not be issued. In the CBER's June report, this outcome was referred to as the "Phase-In" scenario.[24]

[24] For a full discussion of the methods and assumptions used to model the phase-in, see Mark L. Burton, Michael J. Hicks, and Calvin A. Kent, *in Supra note 2.*

The alternative boundary scenario is one in which valley fills that violate the Haden decision would be disallowed regardless of whether they are governed by previously approved permits. The CBER's June report refers to this implementation scheme as the "Restrictive" scenario.

As will become apparent, dealing with two alternative scenarios in the assessment of fiscal impacts is far too cumbersome. As a consequence and in keeping with the study's generally conservative intent, the study team elected to evaluate fiscal impacts under the "Phase-In" scenario. Predicted coal production levels under this scenario are provided in Table 3.2

Table 3.2
Forecasted Coal Production Under the Phase-In Scenario

County	*2000 Estimate*	*2001*	*2002*	*2003*	*2004*	*2005*
Barbour	801,732	743,632	686,832	631,332	577,132	524,132
Boone	32,396,763	29,440,063	27,809,663	26,226,163	24,688,363	23,195,263
Braxton	1,247,125	1,199,325	1,152,625	1,107,025	1,062,425	1,018,825
Brooke	1,905,825	1,813,625	1,723,525	1,635,525	1,549,525	1,465,525
Clay	5,768,916	4,602,916	3,463,716	2,350,716	1,263,316	200,916
Fayette	4,186,356	4,020,256	3,853,356	3,685,656	3,517,156	3,292,156
Grant	747,267	595,367	446,967	301,967	160,267	21,867
Greenbrier	562,909	536,409	510,509	485,209	460,509	436,409
Harrison	7,377,285	7,107,385	6,843,685	6,586,085	6,334,385	6,088,485
Kanawha	14,931,951	10,499,051	9,054,251	7,600,651	6,138,351	4,437,651
Lincoln	2,511,580	2,434,480	2,359,180	2,285,580	2,213,680	2,143,480
Logan	8,498,375	4,443,375	3,540,075	1,965,075	1,865,975	1,091,675
Marshall	11,149,583	10,612,183	10,087,183	9,574,283	9,073,183	8,583,583
McDowell	4,419,573	4,131,773	3,856,173	3,592,373	3,339,873	3,098,273
Mineral	43,672	27,072	10,872	0	0	0
Mingo	22,041,012	20,414,012	18,896,712	17,482,312	16,164,412	14,937,012
Monongalia	11,807,680	11,142,180	10,491,980	9,856,780	9,236,180	8,629,880
Nicholas	5,201,157	2,726,657	2,503,957	2,285,657	2,071,557	1,861,557
Preston	1,238,321	1,166,921	1,097,121	1,028,921	962,321	897,221
Raleigh	10,369,771	10,530,171	10,692,271	10,855,971	11,021,271	10,418,471
Tucker	145,396	113,696	82,696	52,396	22,796	0
Upshur	2,920,730	2,804,430	2,690,830	2,579,830	2,471,430	2,365,530
Wayne	7,543,061	7,029,061	6,526,861	6,036,261	5,556,961	5,088,661
Webster	4,709,048	4,179,748	3,662,648	3,157,448	2,663,848	2,181,648
Wyoming	10,092,981	9,143,981	8,260,181	7,437,681	6,672,681	5,961,681
TOTAL	**172,650,266**	**151,457,770**	**140,303,870**	**128,800,898**	**119,087,598**	**107,939,901**

The results suggest that within five years of its implementation, the Haden decision will reduce coal production by nearly 41 million tons below the level where it would otherwise be. In Kanawha County alone, the predicted fifth year production decrease is nearly 10 million tons.

Chapter 4 - Projected Economic and Fiscal Impacts

Estimating Economic Impacts

A three-step approach was used to estimate and substantiate the economic impacts of policy-induced reductions in coal production. The first step of this process involved calculating county specific impacts. This was accomplished through the application of IMPLAN regional simulation software.[25] Among other items, IMPLAN provides estimates of changes to employment, income, and output under the phase-in scenario.

Simply aggregating individual county effects does not fully capture the economic consequences of implementing the Haden decision. This is largely because non-coal producing counties will also be impacted by reduced coal production.[26] To capture the additional effects, a State-wide IMPLAN model was executed based on the aggregate value of lost coal production. Differences between the State-wide impacts and the aggregated county values represent the economic impact of lost coal production on non-coal producing counties. Unfortunately, there is no generally defensible method of accurately allocating these economic impacts to specific non-coal producing counties. However, it is reasonable to assume that impacts would be greatest in areas currently experiencing the largest amount of economic activity, so that counties such as Cabell, Wood, and Harrison might expect relatively large effects from reduced coal production.

The final step in estimating the economic impacts of policy-induced reductions in coal production involved a comparison of State-wide IMPLAN estimates with estimates derived through the use of an alternative simulation software product developed by Regional Economic Models, Inc. (REMI). The version of the West Virginia REMI model currently licensed to CBER does not allow for county-specific analyses. It does, however, produce State-wide estimates that are comparable in nature to the IMPLAN outputs, so that a State-wide comparison was possible. The REMI model is significantly more complex than IMPLAN. It accounts for dynamic interrelationships that are absent in static models like IMPLAN. Thus, when economic disturbances (and their effects) are likely to be spread across time, REMI can provide a clearer picture of expected outcomes. A summary of the comparisons performed is provided in Appendix D. However, suffice it to say that in the current setting the two software packages produce largely similar results in the current setting.

The Issue of Migration

Economists typically assume that a decline in economic activity within a given region will lead to out-migration, as residents relocate in order to find new employment

[25] IMPLAN is a proprietary software product developed and distributed by MIG, Inc.

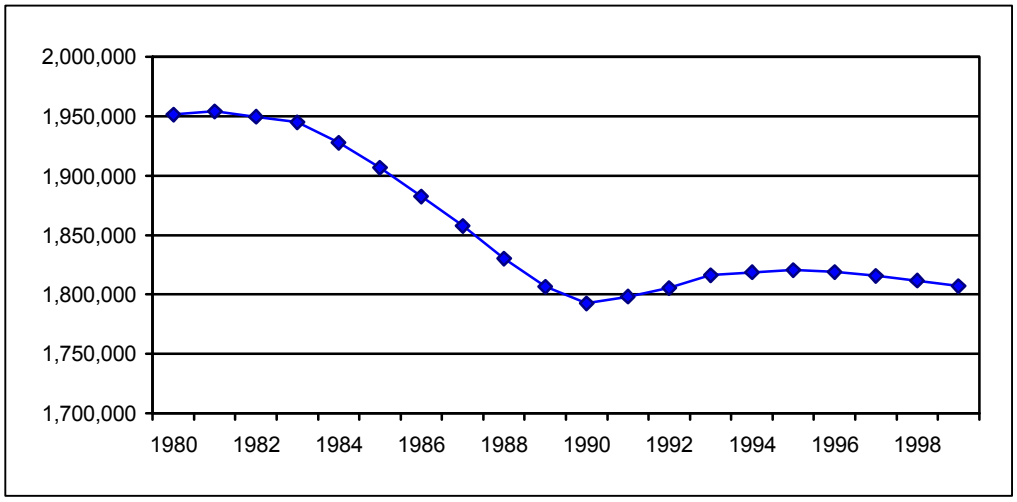
[26] It is also possible that coal producing counties may be adversely affected by lost production in nearby counties.

and replace lost income. Indeed, the REMI model referenced above includes a migration component reflecting this phenomenon. The issue of migration is especially important in this study since it potentially impacts the appropriate mix and level of public services provided by the State.

West Virginia's Population History

The population of West Virginia has declined by roughly eight percent since its peak in 1981. This contrasts dramatically with the national population increase of just over 19 percent over the same period. The population declines of the past two decades result primarily from economic migration - the search for employment opportunities. This is due to employment losses in three key industries in the State: steel, chemicals, and coal. Not surprisingly, increases in the State's population from its founding through 1980 were also strongly correlated with employment in these sectors. These types of long-term sectoral shifts are common, and result in vastly different regional population densities and compositions in regions over time. The nationwide changes in agricultural employment, from one third to roughly three percent of our nation's workforce over a fifty year period, is a prime example. This sectoral shift has left many rural agricultural communities throughout the United States with a declining population bereft of younger citizens. However, since most individuals do not enjoy the longevity necessary to experience more than one of these events, they appear uncommon, and especially traumatic. See Figure 4.1.

Figure 4.1
West Virginia's Population History



The population decline in West Virginia is not a generalized event. The southern part of the State has experienced the most dramatic population declines, clustered in coal producing counties. These population declines have led to the virtual abandonment of many communities and with concurrent changes in the mix, level and per unit cost of government services. Population declines typically result in a short run increase in demand for social services and a reduced demand for infrastructure construction and maintenance. This changes the mix of government service.

However, in the current context, out-migration in response to reduced coal production is predicted to be almost nonexistent. Appendix D details the model that was used to predict the migratory behavior of West Virginians in response to the predicted decline in coal-related commerce. This model performed more than adequately. However, the predicted out-migration was sufficiently low, under 1,000 persons over the five-year forecast, so the study team simply elected to ignore it entirely.

There are several reasons that potential migration is not an issue in the current study. First, a great deal of out-migration took place during the late 1980's, so the young and relatively well educated – the most likely candidates for migration – are already gone. This is evidenced by the fact that West Virginia already has the highest median age in the United States. The State's relatively old population also helps contribute to the fact that its level of transfer payments and other non-wage incomes is also very high. Transfer payments, retirement benefits, and other non-wage income makes it possible for a large portion of West Virginia's population to ignore the economic signals that would elsewhere produce out-migration. The formal econometric model of migration used here reflects these factors. Finally, even when other factors are accounted for, West Virginia's residents seem remarkably reluctant to leave the State, choosing instead to endure economic hardships that could be avoided by relocation.

The analysis does not forecast an end to out-migration, only that it will continue at the current rate in the counties affected by the Haden decision. This means that, for all practical purposes, a reduction in demand for public services is unlikely to result from population reductions attributable to the Haden decision. This may create problems both for the counties and the State, since predicted declines in revenues will not be matched by a drop in demand. Again, this is not to suggest that the State's population will stop declining, only that its rate will not be significantly affected by the Haden decision's impact. This has clear implications for school funding and other social services.

Population shifts will not affect the Haden decision's impact on demand for services. However, since a large proportion of government provided services are directly related to the amelioration of poverty and unemployment, the Haden decision will affect the demand level for public services. Most particularly, the State programs of *Temporary Assistance for Needy Families*, *Medicaid,* and *Unemployment Compensation* will be impacted if the policy-induced economic declines predicted here are, in fact, realized.

Economic Impact Estimation Results

Tables 4.1 – 4.3 contain the predicted changes in employment, incomes, and output under both the baseline and phase-in conditions. Two conclusions are immediately clear from these data. First, the competitive forces already evident in fuel markets will likely produce a measurable degree of economic difficulty for the State over the coming five years. The effects of increased competition are most evident on economic outcomes in coal producing counties, but non-coal producing counties are not immune.

These tables also clearly suggest that implementing the Haden decision will significantly exacerbate any economic distress already evident in the State. Even after

baseline declines in employment, income, and output are accounted for, the Haden decision can be expected to produce additional job, income, and output losses of 7,120, $366 million, and $1.33 billion, respectively. Again, these policy-related outcomes will be most severe in the State's coal producing counties. However, other counties will also be affected. Specifically, the Haden decision is predicted to reduce employment in non-coal producing counties by 2,772 jobs. Incomes in these counties will fall by roughly $72 million and overall output will decline by $245 million.

Table 4.1
Predicted Employment Losses

	BASELINE					*HADEN PHASE-IN*				
County	***Year 1***	***Year 2***	***Year 3***	***Year 4***	***Year 5***	***Year 1***	***Year 2***	***Year 3***	***Year 4***	***Year 5***
Barbour	-10	-19	-29	-38	-47	-11	-22	-33	-43	-53
Boone	-79	-156	-232	-307	-380	-463	-718	-966	-1,206	-1,441
Braxton	-5	-9	-14	-18	-22	-6	-12	-17	-23	-28
Brooke	-11	-22	-33	-43	-53	-15	-29	-43	-56	-69
Clay	-37	-74	-110	-145	-178	-157	-311	-461	-608	-750
Fayette	1	2	2	3	-15	-28	-57	-85	-114	-158
Grant	-8	-15	-22	-29	-36	-27	-53	-78	-103	-127
Greenbrier	-4	-8	-12	-16	-20	-6	-11	-16	-21	-26
Harrison	-51	-101	-150	-198	-244	-56	-110	-163	-215	-265
Kanawha	8	17	25	33	-95	-816	-1,081	-1,347	-1,617	-1,934
Lincoln	-3	-6	-9	-11	-14	-12	-24	-35	-46	-57
Logan	-652	-689	-725	-760	-793	-801	-980	-1,291	-1,310	-1,462
Marshall	-71	-140	-208	-274	-339	-93	-184	-273	-359	-443
McDowell	-24	-48	-71	-93	-115	-54	-107	-157	-205	-251
Mineral	-1	-2	-3	-4	-5	-3	-6	-9	-12	-14
Mingo	-164	-321	-469	-611	-746	-275	-531	-770	-992	-1,200
Monongalia	-81	-160	-237	-313	-386	-137	-271	-402	-529	-653
Nicholas	-24	-46	-67	-88	-108	-567	-618	-669	-718	-766
Preston	-13	-26	-38	-50	-62	-16	-32	-47	-62	-76
Raleigh	58	117	177	239	119	37	74	111	149	11
Tucker	-1	-2	-3	-4	-5	-5	-10	-15	-19	-24
Upshur	-19	-38	-56	-73	-91	-25	-49	-73	-97	-119
Wayne	-46	-91	-135	-178	-219	-87	-172	-255	-336	-415
Webster	-24	-47	-70	-93	-114	-87	-172	-255	-336	-415
Wyoming	-76	-148	-218	-284	-347	-160	-309	-448	-578	-698
State Remainder	-386	-631	-867	-1,096	-1,374	-1,224	-1,987	-2,755	-3,435	-4,147
TOTAL	**-1,722**	**-2,664**	**-3,572**	**-4,449**	**-5,688**	**-5,094**	**-7,779**	**-10,549**	**-12,891**	**-15,579**

Tax Revenue Collections

Appendix D describes the methods through which predicted reductions in economic activity were translated into changes in tax revenues. These methods are similar to the techniques used by CBER in its investigation of the *Agenda for Fair Taxation*.[27] In order to keep the analysis tractable, the current study focuses on the principal set of tax instruments through which the State raises a majority of all revenues. However, the Haden decision and resulting economic disruptions will affect revenues from nearly every revenue source.

Table 4.2
Predicted Income Losses
(Values in thousands of 1999 dollars)

	BASELINE					*HADEN PHASE-IN*				
County	***Year 1***	***Year 2***	***Year 3***	***Year 4***	***Year 5***	***Year 1***	***Year 2***	***Year 3***	***Year 4***	***Year 5***
Barbour	-413	-817	-1,211	-1,596	-1,970	-469	-928	-1,375	-1,813	-2,237
Boone	-4,609	-9,141	-13,598	-17,981	-22,290	-27,137	-42,101	-56,635	-70,779	-84,483
Braxton	-348	-688	-1,020	-1,345	-1,660	-457	-903	-1,338	-1,764	-2,177
Brooke	-581	-1,148	-1,702	-2,244	-2,769	-762	-1,506	-2,233	-2,943	-3,632
Clay	-1,898	-3,753	-5,565	-7,336	-9,053	-7,975	-15,766	-23,378	-30,815	-38,028
Fayette	44	89	133	177	-688	-1,565	-3,137	-4,717	-6,304	-8,424
Grant	-372	-735	-1,090	-1,437	-1,774	-1,304	-2,579	-3,824	-5,041	-6,221
Greenbrier	-153	-302	-447	-590	-728	-203	-402	-596	-786	-970
Harrison	-2,210	-4,370	-6,480	-8,541	-10,540	-2,401	-4,748	-7,040	-9,280	-11,452
Kanawha	444	888	1,334	1,781	-4,968	-43,595	-57,804	-72,100	-86,481	-103,206
Lincoln	-95	-189	-280	-369	-455	-401	-793	-1,176	-1,551	-1,914
Logan	-32,521	-34,370	-36,168	-37,917	-39,619	-39,988	-48,896	-64,428	-65,405	-73,041
Marshall	-3,861	-7,633	-11,318	-14,918	-18,411	-5,064	-10,011	-14,844	-19,566	-24,147
McDowell	-1,095	-2,160	-3,195	-4,203	-5,183	-2,466	-4,827	-7,087	-9,250	-11,319
Mineral	-20	-40	-60	-79	-97	-86	-169	-251	-331	-408
Mingo	-8,903	-17,377	-25,444	-33,123	-40,434	-14,899	-28,793	-41,745	-53,813	-65,053
Monongalia	-3,524	-6,966	-10,330	-13,616	-16,804	-6,012	-11,885	-17,623	-23,229	-28,668
Nicholas	-916	-1,790	-2,625	-3,423	-4,185	-22,102	-24,092	-26,041	-27,954	-29,829
Preston	-463	-915	-1,357	-1,789	-2,208	-561	-1,109	-1,645	-2,168	-2,676
Raleigh	2,549	5,159	7,830	10,564	5,245	1,621	3,258	4,912	6,582	492
Tucker	-45	-89	-132	-175	-215	-190	-375	-557	-734	-906
Upshur	-652	-1,288	-1,910	-2,518	-3,107	-853	-1,686	-2,499	-3,295	-4,066
Wayne	-2,332	-4,610	-6,835	-9,010	-11,119	-4,439	-8,776	-13,013	-17,153	-21,168
Webster	-1,286	-2,542	-3,769	-4,968	-6,131	-4,627	-9,147	-13,564	-17,878	-22,064
Wyoming	-4,190	-8,191	-12,011	-15,661	-19,145	-8,841	-17,075	-24,738	-31,864	-38,488
State Remainder	-8,745	-14,757	-20,572	-26,198	-33,002	-30,538	-49,831	-69,080	-86,591	-105,045
TOTAL	**-76,193**	**-117,735**	**-157,825**	**-196,513**	**-251,309**	**-225,313**	**-344,079**	**-466,614**	**-570,205**	**-689,129**

[27] These methods are similar to the techniques used by CBER in its investigation of the *Agenda for Fair Taxation*. See Mark L. Burton. "The Projected Economic Impacts of West Virginia's Agenda for Fair Taxation: Revised Preliminary Estimates." Center for Business and Economic Research, Marshall University, January 1999.

Table 4.3
Predicted Output Reductions
(Values in millions of 1999 dollars)

	BASELINE					*HADEN PHASE-IN*				
County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Barbour	-1.61	-3.18	-4.72	-6.22	-7.67	-1.83	-3.61	-5.36	-7.06	-8.71
Boone	-16.59	-32.89	-48.93	-64.70	-80.20	-97.64	-151.49	-203.78	-254.57	-303.88
Braxton	-1.01	-1.99	-2.95	-3.89	-4.80	-1.32	-2.61	-3.87	-5.10	-6.30
Brooke	-2.09	-4.13	-6.13	-8.08	-9.97	-2.74	-5.42	-8.04	-10.60	-13.08
Clay	-7.36	-14.55	-21.57	-28.44	-35.10	-30.91	-61.12	-90.63	-119.45	-147.42
Fayette	0.16	0.32	0.48	0.64	-2.48	-5.64	-11.31	-17.00	-22.73	-30.37
Grant	-1.41	-2.79	-4.14	-5.46	-6.74	-4.96	-9.80	-14.53	-19.15	-23.63
Greenbrier	-0.63	-1.24	-1.84	-2.42	-2.99	-0.83	-1.65	-2.45	-3.23	-3.98
Harrison	-8.01	-15.84	-23.48	-30.96	-38.20	-8.70	-17.21	-25.52	-33.63	-41.51
Kanawha	1.53	3.07	4.61	6.16	-17.17	-150.66	-199.77	-249.17	-298.87	-356.67
Lincoln	-0.46	-0.90	-1.34	-1.76	-2.17	-1.92	-3.79	-5.62	-7.40	-9.14
Logan	-115.66	-122.24	-128.63	-134.85	-140.90	-142.22	-173.90	-229.14	-232.61	-259.77
Marshall	-13.30	-26.29	-38.98	-51.39	-63.41	-17.44	-34.48	-51.13	-67.40	-83.17
McDowell	-4.38	-8.64	-12.78	-16.81	-20.73	-9.86	-19.31	-28.35	-37.00	-45.28
Mineral	-0.10	-0.20	-0.29	-0.38	-0.47	-0.42	-0.83	-1.23	-1.62	-1.99
Mingo	-32.72	-63.86	-93.51	-121.73	-148.59	-54.75	-105.81	-153.41	-197.76	-239.07
Monongalia	-12.99	-25.68	-38.08	-50.19	-61.94	-22.16	-43.81	-64.96	-85.63	-105.67
Nicholas	-3.67	-7.18	-10.54	-13.74	-16.79	-88.70	-96.68	-104.51	-112.18	-119.71
Preston	-1.95	-3.85	-5.72	-7.53	-9.30	-2.36	-4.67	-6.93	-9.13	-11.27
Raleigh	9.17	18.57	28.18	38.02	18.88	5.83	11.73	17.68	23.69	1.77
Tucker	-0.18	-0.36	-0.53	-0.70	-0.86	-0.76	-1.50	-2.22	-2.92	-3.61
Upshur	-2.82	-5.58	-8.28	-10.92	-13.47	-3.70	-7.31	-10.84	-14.28	-17.63
Wayne	-8.67	-17.14	-25.42	-33.51	-41.35	-16.51	-32.64	-48.39	-63.79	-78.72
Webster	-4.82	-9.53	-14.13	-18.62	-22.98	-17.34	-34.29	-50.84	-67.02	-82.71
Wyoming	-15.10	-29.52	-43.29	-56.44	-68.99	-31.86	-61.56	-89.18	-114.86	-138.73
State Remainder	-27.29	-44.90	-61.93	-78.42	-99.42	-94.76	-155.23	-216.01	-270.83	-329.35
TOTAL	**-271.94**	**-420.52**	**-563.93**	**-702.32**	**-897.83**	**-804.17**	**-1,228**	**-1,665**	**-2,035**	**-2,460**

Predicted revenue reductions from West Virginia's Severance Tax, Property Taxes, Personal Income Tax, Sales and Use Tax, Corporate Net Income Tax, and Business Franchise Tax are summarized in Table 4.4. These are presented under both baseline conditions and under the Haden phase-in scenario.

This table and accompanying figure make a number of points very clear. First, even absent the Haden decision, West Virginia will very likely see a significant reduction in coal-related tax revenues. Indeed, even if there are no further restrictions in mining

methods, the study predicts annual revenue reductions totaling nearly $36 million by the fifth year of the forecast period.

If the Haden decision is implemented and if its implementation leads to the reductions in coal predicted here, the impact on State and local tax revenues will be precipitous. Table 4.4 suggests that by the fifth forecast year total revenues derived from the six tax instruments considered here will be reduced by more than $160 million, with more that $110 million of that reduction being directly attributable to restrictions on valley fills. The total predicted loss equals nearly nine percent of the West Virginia's total 1999 tax revenues.

The timing of the predicted revenue reductions is based on the structure of the tax instruments considered and the assumption that both firms and individuals will act immediately to minimize their tax liability. Particularly in the case of property tax revenues, these methods and assumptions have important impacts. Specifically, readers will observe that property tax revenue declines do not begin until year two of the forecast period. This owes to the structure of West Virginia's property tax, whereby there is a considerable lag between when property is assessed and actual tax payments are due. However, the analysis does assume that firms will move unneeded personal property from the State as quickly as possible. Again, these and other issues are discussed at length in Appendix C.

Table 4.4
Total Predicted Revenue Reductions
(in millions of 1999 dollars)

	BASELINE					***HADEN PHASE-IN***				
Tax	***Year 1***	***Year 2***	***Year 3***	***Year 4***	***Year 5***	***Year 1***	***Year 2***	***Year 3***	***Year 4***	***Year 5***
Severance	-6,526	-10,092	-13,533	-16,854	-21,547	-19,298	-29,471	-39,961	-48,820	-58,986
Property	3,521	6,685	-3,459	-10,080	-16,438	3,521	-13,267	-31,086	-45,867	-58,596
Sales and Use	-2,210	-3,414	-4,577	-5,699	-7,288	-6,534	-9,978	-13,531	-16,533	-19,975
PIT	-2,232	-3,450	-4,624	-5,758	-7,363	-6,602	-10,082	-13,671	-16,704	-20,182
CNIT	-610	-943	-1,264	-1,574	-2,013	-1,820	-2,788	-3,785	-4,630	-5,598
BFT	-404	-624	-837	-1,042	-1,333	-1,205	-1,846	-2,506	-3,066	-3,626
TOTAL	**-8,460**	**-11,837**	**-28,294**	**-41,008**	**-55,982**	**-31,939**	**-67,431**	**-104,541**	**-135,621**	**-166,963**

Note: These revenue shortfalls have been adjusted for impacts in Fiscal, not calendar years. Since tax instruments vary in the date upon which assessments are fixed, there will be some variation between the coal production forecasts and economic impacts in each calendar year and the revenue changes for which fiscal years are appropriate.

Chapter 5 - The Demand for Government Services

The demand for government services is generally increased during periods of economic distress. In this regard, the current context is likely to be no different. The analysis already presented in this document primarily focuses on the Haden decision's economic and tax revenue impacts. So, this presents a sum or aggregate impact on the communities involved. As previously mentioned, the Haden decision's impact on migration is estimated to be insignificant. Again, that means that the population decline will continue at the current rate, not accelerate. An additional layer of analysis, presented here, will focus on the Haden decision's impact on demand for public services provided by State and local government. These issues are critical for policy-makers attempting to allocate resources among competing needs. The primary areas of impact involve the social welfare spending on Temporary Assistance to Needy Families (TANF), Medicaid, and Unemployment Security.

Temporary Assistance for Needy Families

The passage of the *Personal Responsibility and Work Opportunity Reconciliation Act of 1996* (PRWORA) dramatically affected the provision of welfare payments. Though PRWORA affected virtually every component of the programs it replaced (*Aid to Families with Dependent Children*), its primary impact on a number of recipients was in requiring work and imposing a lifetime cap on the number of months of assistance any individual could receive. This led to dramatic declines in the number of TANF cases through the late 1990's to the present. However, these declines can be attributed to programmatic changes, an aging of the State's population, and an overall improvement in the U.S. and State economies.

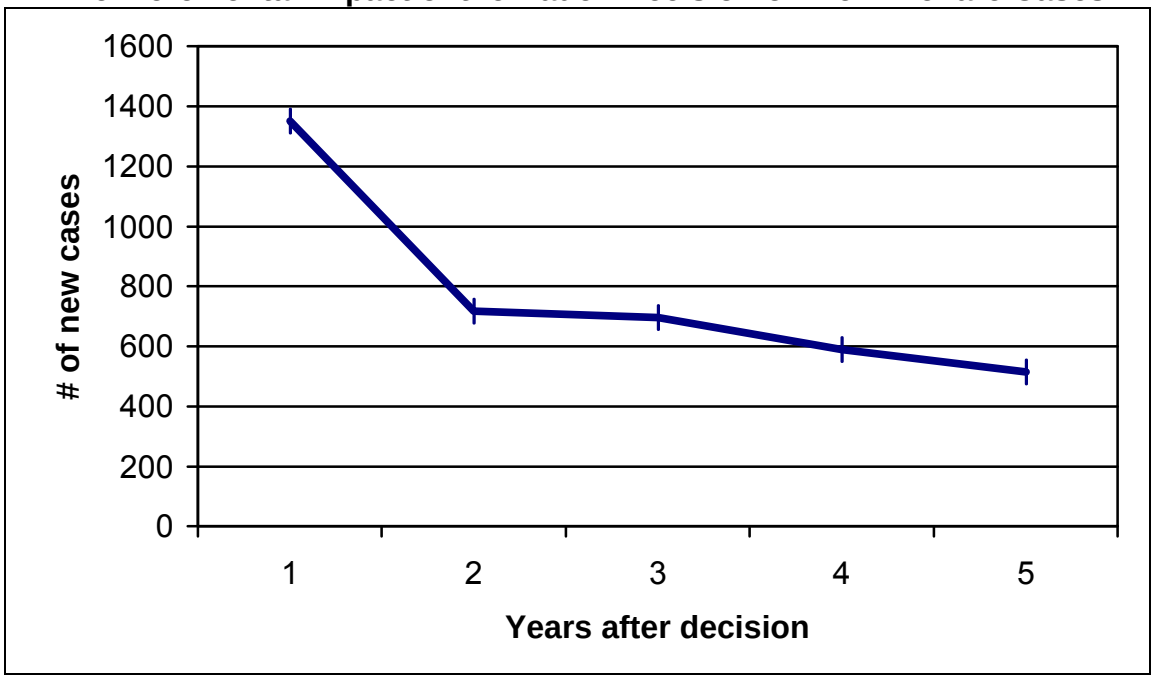
Recent research regarding *West Virginia Works*, the State's version of TANF, suggests that 56 percent of the State's caseload decline is attributable to program changes, 16 percent to the State's improving economy, five percent due to the *Earned Income Tax Credit* program started in 1991, and the remainder likely due to demographic impacts. These calculations suggest that between 1996 and 1999 almost 2,100 TANF cases exited the program due to the State's improving economy. This occurred while overall cases in the State dropped from just over 36,000 to roughly 13,000.

Under the baseline forecast, we expect a modest slowdown in coal employment, which will lead to slower State economic growth. Under this forecast, it is unlikely that there will be significant increases in TANF cases. It is also very unlikely that the rapid declines in caseloads enjoyed during the past decade will continue. It is more probable that the rate of decline in caseloads will stabilize at near zero. This is not unexpected, since the overall economy is growing at a slower rate, and those still on the TANF roles will be more difficult to transition to work.

The difficulty in transition to work by many in the remaining pool is caused by three factors. First, low employment skills will continue to be a barrier to labor market entry. Second, there is a constant churning or turnover in caseloads that are of short duration, or truly temporary assistance. Finally, many recipients will meet waivers on work requirements. Therefore, under the baseline forecast, we predict a continued level of TANF participation of between 9,000 and 12,000 cases through the forecast horizon.

Under the Haden Decision impacts described in this study, there will be an increase in the number of TANF cases. The impact will be an increase in the annual additions to the TANF roles through new cases. However, it is virtually impossible to estimate the net caseload changes, since some of these recipients may have met their five-year time limit. This would make them ineligible for further benefits. These annual incremental changes in TANF caseloads are illustrated in Figure 5.1.

Figure 5.1
The Incremental Impact of the Haden Decision on New Welfare Cases



The fiscal impacts of the caseload increases involve both revenue and expenditures. The revenue impact was included in the earlier analysis. The expenditure impact is difficult to estimate with accuracy, primarily because of the newly imposed lifetime participation cap. Expenditure estimates will also be affected by business cycle conditions during the impact period. However, reviewing information on a number of southeastern states, we can provide rough expenditure estimates for these predicted caseload increases. Assuming the late 1990's average caseload grant of $145 per week, the average duration of a case being 33 months (from historical data), and a uniform distribution of cases throughout each of the years, we would expect family grants to cost the State roughly $5.2 million the first year, rising to more than $13 million the second year where direct costs should stabilize through the forecast period. The indirect costs of

additional administration and staff should roughly parallel the direct costs. Fortunately, Federal Program grants are likely to comprise between 25 and 50 percent of total program costs.

Medicaid

Expenditures by the State on the Federal Medicaid program have steadily increased through the 1990's. This increase is primarily attributable to changes in the program that liberalize income requirements and expansion in coverage. These program changes are too recent and numerous to generate a reliable statistical forecast. However, a projection of expenditures based upon the estimated increases in TANF caseloads offers a clear projection of the program's minimum increases. That is, under the Haden decision, Medicaid roles are projected to increase by a little less than 1,400 cases in the first year. However, the fiscal impact of this will be lessened as the new entrants likely suffer from lower than average recipient medical costs. This program is less flexible for State policy-makers in setting the level of expenditures, so while potentially costly, it will most likely draw resources from other spending areas.

Unemployment Compensation

The loss of jobs forecast under the Haden decision scenario will place added pressure upon the employment security fund. Our analysis (outlined in Appendix D) suggests that a one percent increase in the annual unemployment rate will reduce the balance of the fund, as it is currently programmed, by a little over $9.7 million. This makes the unemployment security program one of the State's least stable fiscal tools. This problem is common to almost every State, but perhaps more pronounced in West Virginia. During a period of relatively modest changes in the State's unemployment rate, the fund is able to match revenues with expenditures, but during periods of rapid changes, the revenue response lags far behind expenditures.

Under the Haden decision scenario, the State's unemployment rate will increase by just under 0.7 percent in the first year and just over one percent during the second year. This scenario will stress the system, but not lead to a deficit. It is probable that collection rates will respond with sufficient speed to prevent the fund from defaulting.

Demands for Local Services

Because the current analysis predicts little policy-induced migration, there is likely to be no acceleration in the reduction of demand for local government services such as education, fire and police protection, water treatment, etc. Thus, the localized trends that are currently observable are likely to continue. Those counties and municipalities that are currently gaining population will see demand for local services increase and those areas where population is declining will continue to see demand for government services fall, regardless of whether or not Judge Haden's decision is implemented.

This having been said, readers must realize that extant population declines are already placing severe fiscal strains on a number of municipal and county governments. Many of the costs of providing government services are invariant to population levels. Thus, as populations fall these relatively fixed costs must be spread over fewer and fewer taxpayers. This increase in tax burden only serves to exacerbate patterns of out-migration, making fiscal problems even worse.[28]

[28] Necessary property tax reassessments in Kanawha County and the fiscal problems currently evident in Huntington are both symptomatic.

Chapter 6 - The Fiscal Challenge

As outlined above, the revenue sources for each of the State's major Funds draws upon several sources. This method, though complicated, is necessary to provide some stability to each of the revenue sources and is akin to portfolio diversification in a private retirement account. Many local governments do not enjoy the same stability. Specifically, reductions in Severance tax and Property tax receipts are likely to affect every county and municipality in the State, and threaten the fiscal health of a number of communities. Indeed, the greatest policy-related fiscal challenge to the State government may stem from a need to provide local fiscal stability.

County and Municipal Fiscal Issues

Coal-related reductions in commercial activity are likely to affect two principal county and municipal revenue sources – locally distributed severance tax revenues and property tax collections. In coal-dependent counties and communities, the loss of coal severance and property tax dollars associated with further surface mining restrictions may make it difficult for these local governments to provide the most fundamental services. However, because coal-severance revenues are spread broadly across the State, the difficulties associated with lost coal production will not be limited to coal producing regions.

Severance Tax Revenues

Roughly 75 percent of coal severance taxes collected by the State are distributed directly back to the counties where the coal was mined. For some communities, such as Kanawha County, while this represents a significant amount of income, it is proportionately not a critical revenue source. For other, typically less prosperous counties, such as Logan and Mingo, severance taxes represent a large proportion of overall tax revenues and are necessary for the funding of current county operations. These differences are not, as some have suggested, the result of poor decision-making by county officials, but simply the result of fiscal conditions outside the control of elected leaders.

The loss of a portion of a county's share of severance taxes will undoubtedly challenge any county in which coal is surface mined. However, the reduction in severance tax will affect every municipality and county in the State. All coal severance taxes not returned directly to counties or employed in the Special Reclamation or Infrastructure Fund are distributed to counties and municipalities across the State.[29] These distributions are made in direct proportion to their most recent census population. This means that every community will feel, to some degree, the impact of the Haden decision. The magnitudes of the revenues are significant. For example, in 1999 the city of Huntington received $140,000 in severance taxes, even though no coal was produced in

[29] The 25 percent portion of severance taxes typically has been redistributed as 15.62 percent to total unincorporated county areas and 9.38 percent to municipalities. These distributions are based on total severance tax collections by the State.

Cabell County. Under our predictions, Huntington is expected to lose $3,735 in the first year following implementation of the Haden decision. Table 6.1 provides estimates of county level severance losses to unincorporated areas. Predicted municipal severance losses for the 20 largest cities and towns are provided in Table 6.2.

Table 6.1
Unincorporated County Severance Tax Losses

County	*BASELINE*					*PHASE-IN*				
	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Barbour	178	299	412	526	685	657	1,006	1,370	1,681	2,040
Berkeley	787	1,323	1,822	2,322	3,028	2,902	4,446	6,052	7,427	9,012
Boone	377	634	873	1,113	1,451	1,391	2,131	2,901	3,560	4,320
Braxton	180	303	417	532	693	665	1,018	1,386	1,701	2,064
Brooke	247	415	571	728	949	910	1,394	1,898	2,329	2,826
Cabell	724	1,217	1,676	2,136	2,785	2,670	4,090	5,567	6,832	8,290
Calhoun	126	212	292	373	486	466	713	971	1,192	1,446
Clay	164	276	381	485	632	606	929	1,264	1,551	1,883
Doddridge	108	181	250	318	415	398	610	830	1,018	1,236
Fayette	553	930	1,282	1,633	2,130	2,041	3,127	4,257	5,224	6,339
Gilmer	97	163	225	287	374	358	549	747	917	1,113
Grant	134	225	310	395	516	494	757	1,030	1,265	1,534
Greenbrier	387	650	896	1,141	1,488	1,426	2,185	2,974	3,650	4,429
Hampshire	251	422	581	741	966	926	1,418	1,930	2,369	2,875
Hancock	217	364	502	639	834	799	1,225	1,667	2,045	2,482
Hardy	152	256	352	449	585	561	859	1,170	1,436	1,742
Harrison	587	986	1,359	1,731	2,258	2,164	3,315	4,513	5,538	6,720
Jackson	328	551	759	967	1,261	1,209	1,852	2,521	3,094	3,754
Jefferson	478	804	1,107	1,410	1,839	1,763	2,701	3,676	4,511	5,474
Kanawha	1,750	2,943	4,054	5,165	6,736	6,457	9,891	13,464	16,522	20,049
Lewis	206	347	478	609	794	761	1,166	1,587	1,948	2,363
Lincoln	349	586	808	1,029	1,342	1,287	1,971	2,683	3,292	3,995
Logan	665	1,119	1,541	1,963	2,560	2,454	3,760	5,118	6,280	7,621
Marion	516	867	1,195	1,522	1,985	1,903	2,915	3,968	4,869	5,909
Marshall	347	584	805	1,026	1,337	1,282	1,964	2,673	3,281	3,981
Mason	285	480	661	843	1,099	1,053	1,614	2,196	2,695	3,271
McDowell	459	773	1,064	1,356	1,769	1,695	2,597	3,535	4,338	5,264
Mercer	757	1,274	1,755	2,236	2,916	2,795	4,281	5,828	7,152	8,678
Mineral	319	537	739	942	1,228	1,177	1,803	2,455	3,012	3,655
Mingo	481	808	1,113	1,418	1,850	1,773	2,716	3,697	4,537	5,506
Monongalia	753	1,266	1,744	2,222	2,898	2,778	4,255	5,792	7,108	8,625
Monroe	194	326	449	572	746	715	1,095	1,490	1,829	2,219
Morgan	190	319	440	561	731	701	1,074	1,461	1,793	2,176
Nicholas	369	620	854	1,088	1,419	1,360	2,083	2,835	3,479	4,222
Ohio	175	294	405	516	673	645	988	1,345	1,651	2,003
Pendleton	125	210	289	369	481	461	706	961	1,180	1,431
Pleasants	78	132	182	232	302	290	444	604	741	899
Pocahontas	129	218	300	382	498	477	731	995	1,221	1,482
Preston	369	621	856	1,090	1,421	1,363	2,087	2,841	3,487	4,231

Table 6.1 Continued										
Putnam	565	951	1,310	1,669	2,176	2,086	3,196	4,350	5,339	6,478
Raleigh	965	1,623	2,236	2,849	3,715	3,561	5,455	7,425	9,112	11,057
Randolph	319	537	740	942	1,229	1,178	1,805	2,456	3,015	3,658
Ritchie	108	182	250	319	416	398	610	831	1,019	1,237
Roane	220	370	510	649	847	812	1,243	1,692	2,077	2,520
Summers	188	317	437	556	725	695	1,065	1,450	1,779	2,159
Taylor	162	273	376	479	624	598	917	1,248	1,531	1,858
Tucker	76	128	176	224	292	280	429	584	716	869
Tyler	106	178	245	312	407	390	598	814	999	1,212
Upshur	297	499	687	876	1,142	1,095	1,677	2,283	2,802	3,400
Wayne	518	871	1,200	1,529	1,994	1,911	2,928	3,985	4,891	5,935
Webster	163	275	378	482	629	603	923	1,257	1,542	1,871
Wetzel	159	267	368	469	612	587	899	1,223	1,501	1,822
Wirt	75	126	174	222	289	277	425	578	709	860
Wood	675	1,135	1,563	1,992	2,597	2,490	3,814	5,192	6,371	7,731
Wyoming	426	716	986	1,257	1,639	1,571	2,406	3,275	4,019	4,877
Total	**19,613**	**32,984**	**45,438**	**57,893**	**75,493**	**72,368**	**110,858**	**150,896**	**185,176**	**224,703**

Table 6.2
Top 20 City Severance Tax Losses

	BASELINE					***HADEN PHASE-IN***				
City	***Year 1***	***Year 2***	***Year 3***	***Year 4***	***Year 5***	***Year 1***	***Year 2***	***Year 3***	***Year 4***	***Year 5***
Charleston	2,969	4,993	6,946	8,831	11,495	5,427	11,254	17,314	22,503	28,486
Huntington	2,615	4,398	6,118	7,779	10,125	3,735	8,867	14,205	18,776	24,046
Wheeling	1,800	3,027	4,211	5,354	6,968	3,642	7,174	10,848	13,993	17,620
Parkersburg	1,755	2,951	4,106	5,221	6,795	2,784	6,228	9,811	12,878	16,415
Morgantown	1,341	2,256	3,138	3,990	5,194	2,174	4,806	7,544	9,889	12,592
Fairmont	1,047	1,761	2,450	3,115	4,055	1,999	4,054	6,192	8,023	10,133
Weirton	963	1,620	2,254	2,865	3,730	1,968	3,859	5,825	7,508	9,450
Beckley	948	1,595	2,219	2,821	3,672	1,942	3,803	5,739	7,397	9,308
Clarksburg	936	1,574	2,190	2,784	3,624	1,514	3,350	5,261	6,896	8,782
Martinsburg	729	1,227	1,706	2,170	2,824	1,467	2,899	4,387	5,662	7,132
South Charleston	707	1,189	1,654	2,103	2,737	1,372	2,759	4,203	5,438	6,863
Bluefield	661	1,112	1,547	1,967	2,560	1,204	2,501	3,851	5,006	6,338
Saint Albans	580	975	1,357	1,725	2,246	1,169	2,307	3,491	4,504	5,673
Vienna	563	947	1,317	1,675	2,180	1,157	2,262	3,411	4,395	5,530
Moundsville	557	937	1,304	1,658	2,158	936	2,030	3,167	4,142	5,265
Dunbar	451	758	1,055	1,341	1,746	798	1,683	2,603	3,391	4,300
Elkins	385	647	900	1,144	1,489	758	1,512	2,297	2,970	3,745
Princeton	365	614	854	1,086	1,414	733	1,449	2,195	2,833	3,568
Oak Hill	353	594	826	1,051	1,367	725	1,418	2,138	2,756	3,467
Bridgeport	349	587	817	1,038	1,352	721	1,406	2,119	2,729	3,433

Property Taxes

Property taxes are used for three main purposes: funding county operations, excess or special levies, and K-12 education. In this section, we will address the first two uses. Virtually every county and municipality in West Virginia collects property taxes for the funding of current operations. Year-by-year accounts of the Haden decision's impacts on both real and personal property tax collections in coal producing counties are provided in the property tax appendices to this report. Year 5 impacts are summarized in Table 6.3.

Table 6.3
Cumulative Predicted Property Tax Changes
(in thousands of 1999 dollars)

	BASELINE					*HADEN PHASE-IN*				
County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Barbour	-422	-959	-1,024	-1,088	-1,150	-422	-966	-1,037	-1,107	-1,176
Boone	5,537	8,920	7,067	5,245	3,453	5,537	4,354	386	-3,479	-7,243
Braxton	86	98	72	47	22	86	93	63	33	3
Brooke	-92	201	1	-193	-383	-92	163	-74	-305	-531
Clay	-227	-562	-684	-804	-921	-227	-822	-1,199	-1,566	-1,926
Fayette	1,500	5,450	5,467	5,484	5,502	1,500	5,140	4,845	4,548	4,251
Grant	-658	-334	-444	-552	-657	-658	-477	-728	-972	-1,211
Greenbrier	8	213	166	119	74	8	204	147	91	37
Harrison	67	118	55	-6	-65	67	113	46	-20	-84
Kanawha	1,247	1,161	1,256	1,352	1,448	1,247	-3,582	-5,064	-6,556	-8,057
Lincoln	3,324	4,152	4,103	4,055	4,008	3,324	4,052	3,906	3,762	3,623
Logan	-6,258	-11,472	-15,129	-15,517	-15,895	-6,258	-12,266	-16,675	-18,525	-18,820
Marshall	-171	-505	-922	-1,329	-1,726	-171	-585	-1,079	-1,562	-2,034
McDowell	-1,977	-2,505	-2,834	-3,153	-3,464	-1,977	-2,714	-3,239	-3,745	-4,232
Mineral	-321	-372	-412	-450	-488	-321	-457	-580	-701	-818
Mingo	-578	-221	-2,035	-3,762	-5,405	-578	-847	-3,227	-5,463	-7,565
Monongalia	404	533	144	-237	-609	404	381	-157	-683	-1,197
Nicholas	7,071	8,737	8,157	7,602	7,073	7,071	1,866	924	8	-883
Preston	-266	-433	-506	-577	-646	-266	-443	-526	-607	-686
Raleigh	-4,241	-4,665	-3,820	-2,955	-2,069	-4,241	-4,817	-4,131	-3,433	-2,721
Tucker	-9	-18	-22	-25	-28	-9	-25	-35	-45	-55
Upshur	129	122	73	24	-24	129	113	54	-4	-60
Wayne	-29	-160	-278	-393	-505	-29	-218	-392	-562	-729
Webster	269	403	237	76	-82	269	180	-203	-578	-944
Wyoming	-937	-1,319	-2,295	-3,228	-4,118	-937	-1,873	-3,355	-4,745	-6,050
TOTAL	**3,455**	**6,584**	**-3,606**	**-10,263**	**-16,657**	**3,455**	**-13,434**	**-31,332**	**-46,215**	**-59,106**

Clearly, the loss of coal-related property tax revenues will, in many instances, impose severe fiscal hardships. Indeed, the fiscal decline in many counties will undoubtedly lead to county level reductions in key services and in personnel. The magnitude of these reductions will most likely be similar to those experienced in Logan

County in 2000. In many ways, Logan County is representative of the potential impact of the Haden Decision, since the Dal-Tex mine was the direct defendant affected by *Bragg v. Robertson*. In the first severance tax distribution following this impact, Logan County laid off roughly a fifth of its county non-safety workforce. We predict similar occurrences throughout the State following the implementation of the Haden decision.

The second use of property taxes is for a myriad of excess or special levies. These are too numerous to individually identify here, but they fall into four broad categories: county operations, schools, infrastructure, and miscellaneous. Some of these excess levies generate annual income, while others pay for local bonds. The excess levies for county operations necessarily will suffer many of the same proportionate declines as do the basic county operations collections. The miscellaneous expenditures include library, senior and youth center operations, and other activities that are clearly important to the citizens of these localities. The current analysis forecasts a decline in the coal related portion of these property taxes at levels that will stress perhaps one dozen coal-producing counties. A select set of examples is provided in Tables 6.4 and 6.5.

Table 6.4
Select Predicted Cumulative State Levy Losses
(Values in thousands of 1999 dollars)

County	*BASELINE*					*HADEN PHASE-IN*				
	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
STATE GENERAL										
Boone	21.7	34.9	27.7	20.5	13.5	21.7	17.0	1.5	-13.6	-28.3
Fayette	6.5	23.5	23.6	23.6	23.7	6.5	22.2	20.9	19.6	18.3
Kanawha	5.1	4.7	5.1	5.5	5.9	5.1	-14.6	-20.6	-26.7	-32.8
Lincoln	13.1	16.4	16.2	16.0	15.8	13.1	16.0	15.4	14.8	14.3
Logan	-27.2	-49.9	-65.9	-67.6	-69.2	-27.2	-53.4	-72.6	-80.7	-81.9
Nicholas	35.8	44.2	41.3	38.4	35.8	35.8	9.4	4.7	0.0	-4.5
Raleigh	-16.5	-18.1	-14.8	-11.5	-8.0	-16.5	-18.7	-16.0	-13.3	-10.6
Other Counties	-22.1	-26.5	-49.1	-70.9	-91.9	-22.1	-38.6	-72.6	-105.1	-136.3
State Total	**16.3**	**29.1**	**-16.1**	**-45.9**	**-74.5**	**16.3**	**-60.7**	**-139.3**	**-204.9**	**-261.8**
STATE SCHOOL CURRENT										
Boone	1,775	2,859	2,265	1,681	1,107	1,775	1,395	124	-1,115	-2,321
Fayette	530	1,925	1,931	1,937	1,943	530	1,815	1,711	1,607	1,501
Kanawha	416	387	419	450	482	416	-1,193	-1,687	-2,184	-2,684
Lincoln	1,073	1,340	1,324	1,309	1,294	1,073	1,308	1,261	1,214	1,169
Logan	-2,232	-4,092	-5,396	-5,535	-5,669	-2,232	-4,375	-5,947	-6,607	-6,713
McDowell	-698	-885	-1,001	-1,114	-1,224	-698	-959	-1,144	-1,323	-1,495
Nicholas	2,930	3,620	3,379	3,150	2,930	2,930	773	383	3	-366
Raleigh	-1,349	-1,484	-1,215	-940	-658	-1,349	-1,533	-1,314	-1,092	-866
Other Counties	-1,071	-1,252	-2,916	-4,521	-6,069	-1,071	-2,135	-4,636	-7,033	-9,332
State Total	**1,372**	**2,419**	**-1,210**	**-3,582**	**-5,863**	**1,372**	**-4,902**	**-11,250**	**-16,530**	**-21,105**

Table 6.5
Select Predicted Cumulative County Excess Levy and Bond Losses
(Values in thousands of 1999 dollars except School Excess in millions)

	BASELINE					*HADEN PHASE-IN*				
County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
					COUNTY CURRENT					
Boone	1,193	1,922	1,523	1,130	744	1,193	938	83	-750	-1,561
Fayette	370	1,344	1,348	1,353	1,357	370	1,268	1,195	1,122	1,048
Kanawha	261	243	263	283	303	261	-750	-1,060	-1,373	-1,687
Lincoln	749	936	925	914	903	749	913	880	848	816
Logan	-1,559	-2,857	-3,768	-3,864	-3,958	-1,559	-3,055	-4,153	-4,613	-4,687
Nicholas	2,011	2,485	2,320	2,162	2,012	2,011	531	263	2	-251
Raleigh	-942	-1,036	-849	-656	-460	-942	-1,070	-918	-763	-605
Other Counties	-1,283	-1,543	-2,802	-4,016	-5,186	-1,283	-2,215	-4,108	-5,922	-7,659
State Total	**802**	**1,494**	**-1,040**	**-2,695**	**-4,285**	**802**	**-3,439**	**-7,818**	**-11,448**	**-14,584**
					COUNTY SCHOOL EXCESS (in millions)					
Boone	1.99	3.20	2.54	1.88	1.24	1.99	1.56	0.14	-1.25	-2.60
Fayette	0.59	2.16	2.16	2.17	2.18	0.59	2.03	1.92	1.80	1.68
Kanawha	0.42	0.39	0.43	0.46	0.49	0.42	-1.21	-1.72	-2.22	-2.73
Lincoln	1.20	1.50	1.48	1.47	1.45	1.20	1.47	1.41	1.36	1.31
Logan	-2.44	-4.47	-5.90	-6.05	-6.20	-2.44	-4.78	-6.50	-7.22	-7.34
Nicholas	1.43	1.77	1.65	1.54	1.43	1.43	0.38	0.19	0.00	-0.18
Raleigh	-1.51	-1.66	-1.36	-1.05	-0.74	-1.51	-1.72	-1.47	-1.22	-0.97
Other Counties	-1.45	-1.69	-3.39	-5.03	-6.61	-1.45	-2.43	-4.83	-7.11	-9.29
State Total	**0.24**	**1.20**	**-2.39**	**-4.62**	**-6.75**	**0.24**	**-4.71**	**-10.87**	**-15.87**	**-20.12**
					COUNTY EXCESS					
Kanawha	124	115	124	134	143	124	-355	-502	-650	-798
Lincoln	286	357	353	349	345	286	349	336	324	312
Wayne	-1	-4	-8	-11	-14	-1	-6	-11	-16	-20
State Total	**409**	**468**	**470**	**472**	**474**	**409**	**-12**	**-177**	**-341**	**-507**
					MISC. EXCESS*					
Boone	559	900	713	529	349	559	439	39	-351	-731
Brooke	-5	11	0	-11	-21	-5	9	-4	-17	-29
Harrison	5	8	4	0	-4	5	8	3	-1	-6
Mingo	-15	-6	-53	-97	-140	-15	-22	-83	-141	-196
Wyoming	-23	-32	-55	-78	-99	-23	-45	-81	-114	-146
State Total	**521**	**882**	**609**	**343**	**84**	**521**	**389**	**-126**	**-625**	**-1,107**
					SCHOOL BOND					
Barbour	-121	-275	-293	-311	-329	-121	-276	-297	-317	-337
Kanawha	19	18	19	20	22	19	-54	-77	-99	-122
Monongalia	42	56	15	-25	-64	42	40	-16	-72	-125
Nicholas	664	820	766	714	664	664	175	87	1	-83
Raleigh	-421	-463	-379	-293	-205	-421	-478	-410	-341	-270
Wyoming	-64	-90	-157	-221	-282	-64	-128	-230	-325	-414
Other Counties	-4	37	14	-8	-30	-4	33	6	-20	-46
State Total	**115**	**102**	**-16**	**-125**	**-225**	**115**	**-689**	**-937**	**-1,173**	**-1,397**
					COUNTY BOND					
Grant	-15	-8	-10	-13	-15	-15	-11	-17	-23	-28

*Misc. Excess includes ambulance, fire, library and nutrition (Boone); ambulance and fire (Brooke); and vital services and transit (Harrison).

State Fiscal Issues

The Haden decision's potential fiscal impacts on the State fall into three general categories – school funding, general revenues and the impact of fiscal distress on bonding ability. We discuss each in turn.

K-12 Education Funding

While education is administered at the county level, funding primary and secondary education is the State's legal obligation. Toward that end, West Virginia spent $1,596 million on K-12 education in 2000, or roughly 18.3 percent of the State's annual revenues. Virtually all of this is financed through property taxes. However, the method for collecting and distributing these revenues are not widely known to the State's citizens. Property taxes are collected at the State level and distributed to school districts according to a funding formula. Property taxes for schools are primarily a State (not local) tax. So, any impact on school property taxes will impact counties and communities throughout the State, regardless of whether they are actively engaged in coal production.

The funding formula for K-12 education distributes funds in a formula (outlined in Appendix E), which allocates revenues according to various factors, of which the number of students is the primary element. Other factors include bus insurance, average distance and distribution of students, the proportion of children receiving transportation allowances, etc. Under the Haden decision, the immediate reductions in property tax assessments will impact the State in the year following the actual impact. For this reason property tax impacts will be delayed somewhat. However, by Year 5 after implementation of the Haden decision, the shortfall in total state and county school funding dollars is projected to be nearly $43 million.

Perhaps a greater issue in school funding is the reliance by several counties on excess levies to meet their educational funding demands. In counties where population has declined, there have been reductions in State allocations. This is appropriate, however, the reductions in allocations are based on average costs per student while the impact on actual costs are the incremental costs which are likely higher. This has left these counties little choice but to meet the shortfalls with additional levies. These levies exist in 21 coal-producing counties (43 counties statewide) and will suffer a decline of roughly $4.94 million dollars in the second year following the Haden decision. These revenues represent declines in K-12 education dollars where there is no recourse for meeting these needs. The impact on schools in counties which rely upon excess levies for school funding may be the single largest revenue shortfall forecast in this document.

General State Funding

While the current analysis suggests that the State may be compelled to identify alternative funding sources to replace lost education property tax revenues, there is also a strong indication that the availability of such alternatives will also be restricted by the results of reduced mining activity. Chapter 4 outlines the ways in which Personal Income Tax revenues, Sales Tax revenues, and revenues obtained through a variety of business

taxes will be affected by the economic consequences of the Haden decision. In total, by the fifth year after implementation, these alternative funding sources will yield over $51,000 less per annum than they might otherwise generate.

Bonding Capacity

Perhaps the greatest local tax collection issue that threatens the State is the potential impact of local bond ratings. Based on the property tax declines predicted under the Haden decision several counties will suffer potential bond repayment problems. These bonds include sewer, school, and other infrastructure programs. If these local jurisdictions default on these obligations, the implications for the entire State are potentially severe. West Virginia State Bonds have suffered from low ratings for much of the past two decades. Indeed, it was not until the State seriously pursued comprehensive tax reform that West Virginia bond ratings reached the high level that all other states already enjoy.

Any stress on local bonds will likely have two immediate impacts. The first is to lower the ratings for all municipal and county bonds in the State. This would lead to higher borrowing rates and inevitably lower levels of infrastructure construction across West Virginia. The second impact would be a likely reduction in the State's bond rating. This would compound the fiscal problems already outlined in this analysis. Even if the fiscal impact were not sufficiently severe to warrant a bond rating reduction, West Virginia is too small a market for local bonds for analysis to carefully extend to each region. One default would likely impact governmental borrowing throughout the State.

Chapter 7 - Study Conclusions

At the time of this report, it is unclear whether or not Judge Haden's decision regarding the legality of valley fills will be upheld. However, if the appeals court's decision is in the affirmative and if the Haden decision is implemented through restrictions that, in any way, resemble the analytical conclusions regarding mine size impacts incorporated here, the result will be significant reductions in coal production from surface mines. This will, in turn, result in the loss of thousands of jobs and hundreds of millions of dollars in income across the whole of West Virginia. Thus, the State's legislature acted prudently when it chose to question the extent to which the Haden would threaten the ability of policy-makers to fund necessary governmental activities.

While there remains considerable uncertainty regarding the timing and extent of revisions in mine permitting practices under the Haden decision, the nature and scope of the resulting fiscal impacts are discernable. These may be summarized as follows:

- Implementation of the Haden decision and the consequent reduction in economic activity will generate an aggregate revenue loss across jurisdictions of more than $168 million per year within five years of implementation.

- Again, within five years the state property tax revenues used to fund public education will fall by $4 to $6 million annually. This will force the State to divert other funds in order to discharge its legal obligation. Additionally, aggregate county property tax revenues for public school funding will decrease by $4 to $6 million annually.

- Revenues generated from the State funding sources considered here (CNIT, BFT, PIT, Sales and Use, etc.) will decline by an estimated $8 to $18 million annually if the Haden decision is implemented.

- Very little out-migration is likely to result from the economic outcomes associated with reduced mining activity. Thus, there is likely to be a small but measurable *increase* in the demand for government services

- Counties that rely on coal severance revenues or property taxes that are dependent on a coal-related base will be particularly hard hit by any policy-related reduction in coal production. This conclusion extends to educational expenditures that are funded through excess levies.

- All counties and municipalities will see measurable declines in available revenues owing to reductions in available Severance tax revenues.

- If the State does not actively support municipal and county governments by ensuring that these local governments are able to discharge bond obligations, the ability to secure future bonding will be severely damaged on a State-wide basis.

In summary, the implementation of the Haden decision will squeeze State fiscal resources from a number of directions. Municipal and county governments, themselves pressed for revenue, will likely look for relief from the State. The traditional resources for mandatory school funding will be measurably diminished, and the demand for support services in the form of Medicaid and TANF payments will increase. At the same time, revenues from other tax instruments will also be adversely affected, so that the State's ability to respond to new demands for assistance will be diminished. Finally, even the very credit of the State and its ability to borrow against future prosperity may be damaged if it is not able to protect the credit worthiness of counties and municipalities.

There are undoubtedly critics who will suggest that these conclusions and the analysis that yields them are alarmist or unnecessarily pessimistic. The fact remains, however, that the current analysis has been purposefully conservative. As a demonstration of this assertion, readers should consider the following:

- In spite of urgings to do otherwise, the current analysis does not extend Judge Haden's prohibition of valley fills to underground mining.

- The economic impact analysis does not include probable reductions in government employment. Instead, it is assumed that the State and local governments will somehow find the funding necessary to maintain current service levels.

- The fiscal analysis considers only those revenue sources that were deemed critical and that could be defensibly modeled within the available time frame. State tax revenues from a variety of sources including, but not limited to the Health Care Provider tax, the Automobile Privilege tax, the State Fuel Excise Tax, etc. were excluded even though the study team strongly believes that revenues from these sources will also be affected.

In this light, we see very little that might have been done to produce more conservative estimates. To the contrary, we would only warn that the ultimate magnitude of these foreseeable challenges may be much greater than the estimates provided here.

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Appendix A - Impacts on Employment, Output and Income

Table A-1 County-Level Baseline Employment Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-10	-10	-9	-9	-9	**-47**
Boone	-79	-77	-76	-75	-74	**-381**
Braxton	-5	-5	-4	-4	-4	**-22**
Brooke	-11	-11	-11	-10	-10	**-53**
Clay	-37	-37	-36	-35	-34	**-179**
Fayette	1	1	1	1	-18	**-14**
Grant	-8	-7	-7	-7	-7	**-36**
Greenbrier	-4	-4	-4	-4	-4	**-20**
Harrison	-51	-50	-49	-48	-46	**-244**
Kanawha	8	8	8	8	-128	**-96**
Lincoln	-3	-3	-3	-3	-3	**-15**
Logan	-652	-37	-36	-35	-34	**-794**
Marshall	-71	-69	-68	-66	-64	**-338**
McDowell	-24	-24	-23	-22	-22	**-115**
Mineral	-1	-1	-1	-1	-1	**-5**
Mingo	-164	-156	-149	-142	-135	**-746**
Monongalia	-81	-79	-77	-76	-73	**-386**
Nicholas	-540	-22	-22	-21	-20	**-625**
Preston	-13	-13	-12	-12	-12	**-62**
Raleigh	58	59	60	62	-120	**119**
Tucker	-1	-1	-1	-1	-1	**-5**
Upshur	-19	-19	-18	-18	-17	**-91**
Wayne	-46	-45	-44	-43	-42	**-220**
Webster	-24	-23	-23	-22	-22	**-114**
Wyoming	-76	-73	-69	-66	-63	**-347**
State Remainder	-417	-250	-242	-234	-284	**-1,427**
TOTAL	**-2,269**	**-946**	**-912**	**-879**	**-1,242**	**-6,267**

Table A-2 County-Level Phase-In Employment Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-11	-11	-11	-10	-10	**-53**
Boone	-463	-255	-248	-241	-234	**-1,441**
Braxton	-6	-6	-6	-6	-5	**-29**
Brooke	-15	-14	-14	-14	-13	**-70**
Clay	-157	-154	-150	-147	-142	**-750**
Fayette	-28	-28	-29	-29	-44	**-158**
Grant	-27	-26	-25	-25	-24	**-127**
Greenbrier	-6	-5	-5	-5	-5	**-26**
Harrison	-56	-54	-53	-52	-50	**-265**
Kanawha	-816	-265	-266	-270	-317	**-1,934**
Lincoln	-12	-12	-11	-11	-11	**-57**
Logan	-801	-178	-311	-20	-152	**-1,462**
Marshall	-93	-91	-89	-87	-84	**-444**
McDowell	-54	-52	-50	-48	-46	**-250**
Mineral	-3	-3	-2	0	0	**-8**
Mingo	-275	-256	-239	-223	-207	**-1,200**
Monongalia	-137	-134	-131	-128	-124	**-654**
Nicholas	-569	-51	-50	-49	-48	**-767**
Preston	-16	-16	-15	-15	-14	**-76**
Raleigh	37	37	37	38	-138	**11**
Tucker	-5	-5	-5	-5	-2	**-22**
Upshur	-25	-24	-24	-23	-23	**-119**
Wayne	-87	-85	-83	-81	-79	**-415**
Webster	-87	-85	-83	-81	-79	**-415**
Wyoming	-160	-149	-139	-129	-120	**-697**
State Remainder	-1,232	-771	-777	-690	-721	**-4,191**
TOTAL	**-5,103**	**-2,691**	**-2,776**	**-2,347**	**-2,687**	**-15,623**

Table A-3 County-Level Policy-Induced Employment Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-1	-1	-1	-1	-1	**-5**
Boone	-384	-178	-172	-166	-161	**-1,061**
Braxton	-1	-1	-1	-1	-1	**-5**
Brooke	-3	-3	-3	-3	-3	**-15**
Clay	-120	-117	-114	-112	-108	**-571**
Fayette	-29	-29	-29	-30	-26	**-143**
Grant	-19	-19	-18	-18	-17	**-91**
Greenbrier	-1	-1	-1	-1	-1	**-5**
Harrison	-4	-4	-4	-4	-4	**-20**
Kanawha	-824	-274	-275	-278	-189	**-1,840**
Lincoln	-9	-9	-9	-8	-8	**-43**
Logan	-150	-141	-275	15	-118	**-669**
Marshall	-22	-21	-21	-21	-20	**-105**
McDowell	-30	-29	-27	-26	-24	**-136**
Mineral	-2	-2	-1	1	1	**-3**
Mingo	-111	-100	-90	-81	-73	**-455**
Monongalia	-56	-55	-53	-52	-51	**-267**
Nicholas	-29	-29	-29	-29	-29	**-145**
Preston	-3	-3	-3	-3	-3	**-15**
Raleigh	-21	-22	-23	-24	-17	**-107**
Tucker	-4	-4	-4	-4	-1	**-17**
Upshur	-6	-6	-6	-6	-5	**-29**
Wayne	-41	-40	-39	-38	-37	**-195**
Webster	-63	-62	-60	-59	-57	**-301**
Wyoming	-84	-77	-70	-63	-57	**-351**
State Remainder	-815	-521	-535	-456	-437	**-2,764**
TOTAL	**-2,831**	**-1,746**	**-1,860**	**-1,464**	**-1,442**	**-9,362**

Table A-4 State-Level Employment Impacts

Simulation	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Baseline	-2,269	-946	-912	-879	-1,242	**-6,267**
Phase-In	-5,103	-2,691	-2,776	-2,347	-2,687	**-15,623**
Policy-Induced Difference	-2,831	-1,746	-1,860	-1,464	-1,442	**-9,362**

Table A-5 County-Level Baseline Output Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-1,608,645	-1,571,646	-1,535,498	-1,500,182	-1,455,176	**-7,671,147**
Boone	-16,585,049	-16,307,641	-16,036,839	-15,769,336	-15,505,139	**-80,204,004**
Braxton	-1,006,987	-983,826	-961,198	-939,091	-910,918	**-4,802,020**
Brooke	-2,090,880	-2,042,790	-1,995,806	-1,949,902	-1,891,405	**-9,970,783**
Clay	-7,359,552	-7,190,282	-7,024,906	-6,863,333	-6,657,433	**-35,095,506**
Fayette	159,608	159,608	159,608	159,608	-3,117,453	**-2,479,021**
Grant	-1,412,936	-1,380,438	-1,348,688	-1,317,669	-1,278,138	**-6,737,869**
Greenbrier	-626,073	-611,673	-597,605	-583,860	-566,344	**-2,985,555**
Harrison	-8,011,026	-7,826,772	-7,646,757	-7,470,881	-7,246,755	**-38,202,191**
Kanawha	1,532,813	1,536,213	1,539,610	1,546,408	-23,325,260	**-17,170,216**
Lincoln	-455,438	-444,963	-434,729	-424,730	-411,988	**-2,171,848**
Logan	-115,660,521	-6,576,005	-6,393,631	-6,221,777	-6,049,923	**-140,901,857**
Marshall	-13,298,056	-12,992,201	-12,693,380	-12,401,432	-12,029,389	**-63,414,458**
McDowell	-4,379,406	-4,259,469	-4,142,959	-4,029,874	-3,920,219	**-20,731,927**
Mineral	-99,499	-97,211	-94,975	-92,790	-90,007	**-474,482**
Mingo	-32,717,005	-31,142,064	-29,647,891	-28,221,021	-26,864,828	**-148,592,809**
Monongalia	-12,988,795	-12,690,053	-12,398,182	-12,113,023	-11,749,633	**-61,939,686**
Nicholas	-84,225,134	-3,509,230	-3,351,514	-3,200,964	-3,057,583	**-97,344,425**
Preston	-1,949,640	-1,904,798	-1,860,988	-1,818,185	-1,763,640	**-9,297,251**
Raleigh	9,174,002	9,392,173	9,613,978	9,839,417	-19,144,321	**18,875,249**
Tucker	-179,954	-175,815	-171,771	-167,821	-162,786	**-858,147**
Upshur	-2,824,869	-2,759,897	-2,696,419	-2,634,402	-2,555,370	**-13,470,957**
Wayne	-8,671,554	-8,472,108	-8,277,250	-8,086,873	-7,844,267	**-41,352,052**
Webster	-4,819,119	-4,708,279	-4,599,989	-4,494,189	-4,359,363	**-22,980,939**
Wyoming	-15,097,735	-14,419,562	-13,768,248	-13,150,507	-12,556,266	**-68,992,318**
State Remainder	-32,724,495	-32,592,992	-17,593,963	-17,036,468	-20,996,459	**-120,944,377**
TOTAL	**-357,925,944**	**-163,571,719**	**-143,959,987**	**-138,942,873**	**-195,510,058**	**-999,910,600**

Table A-6 County-Level Phase-In Output Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-1,827,035	-1,785,013	-1,743,958	-1,703,847	-1,652,731	**-8,712,584**
Boone	-97,644,393	-53,843,617	-52,294,758	-50,785,518	-49,309,314	**-303,877,600**
Braxton	-1,320,814	-1,290,435	-1,260,755	-1,231,758	-1,194,805	**-6,298,567**
Brooke	-2,742,300	-2,679,227	-2,617,605	-2,557,400	-2,480,678	**-13,077,210**
Clay	-30,913,961	-30,202,940	-29,508,272	-28,829,582	-27,964,695	**-147,419,450**
Fayette	-5,640,615	-5,667,782	-5,694,949	-5,722,117	-7,640,816	**-30,366,279**
Grant	-4,955,486	-4,841,510	-4,730,155	-4,621,362	-4,482,721	**-23,631,234**
Greenbrier	-834,764	-815,564	-796,806	-778,480	-755,126	**-3,980,740**
Harrison	-8,703,745	-8,503,559	-8,307,977	-8,116,894	-7,873,387	**-41,505,562**
Kanawha	-150,660,903	-49,104,437	-49,403,468	-49,699,174	-57,801,646	**-356,669,628**
Lincoln	-1,915,968	-1,871,901	-1,828,847	-1,786,784	-1,733,180	**-9,136,680**
Logan	-142,217,058	-31,680,562	-55,238,447	-3,475,638	-27,156,263	**-259,767,968**
Marshall	-17,441,399	-17,040,247	-16,648,321	-16,265,410	-15,777,447	**-83,172,824**
McDowell	-9,862,230	-9,444,165	-9,039,806	-8,652,578	-8,279,064	**-45,277,843**
Mineral	-417,979	-408,365	-338,048	0	0	**-1,164,392**
Mingo	-54,752,692	-51,061,005	-47,598,158	-44,350,684	-41,305,136	**-239,067,675**
Monongalia	-22,159,274	-21,649,611	-21,151,670	-20,665,181	-20,045,226	**-105,670,962**
Nicholas	-88,698,597	-7,982,692	-7,824,979	-7,674,428	-7,527,461	**-119,708,157**
Preston	-2,362,689	-2,308,347	-2,255,255	-2,203,384	-2,137,283	**-11,266,958**
Raleigh	5,832,382	5,894,198	5,952,376	6,010,553	-21,918,702	**1,770,807**
Tucker	-756,479	-739,080	-722,081	-705,473	-28,021	**-2,951,134**
Upshur	-3,696,370	-3,611,353	-3,528,292	-3,447,142	-3,343,727	**-17,626,884**
Wayne	-16,508,382	-16,128,689	-15,757,729	-15,395,302	-14,933,443	**-78,723,545**
Webster	-17,343,679	-16,944,774	-16,555,045	-16,174,279	-15,689,050	**-82,706,827**
Wyoming	-31,860,686	-29,671,732	-27,613,714	-25,683,273	-23,870,335	**-138,699,740**
State Remainder	-95,800,556	-91,191,323	-61,763,061	-55,785,460	-59,505,278	**-364,045,678**
TOTAL	**-805,205,671**	**-454,573,730**	**-438,269,777**	**-370,300,591**	**-424,405,530**	**-2,492,755,318**

Table A-7 County-Level Policy-Induced Output Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-218,390	-213,367	-208,460	-203,665	-187,054	**-1,030,936**
Boone	-81,059,344	-37,535,976	-36,257,919	-35,016,182	-33,539,978	**-223,409,399**
Braxton	-313,827	-306,609	-299,557	-292,667	-277,314	**-1,489,974**
Brooke	-651,420	-636,437	-621,799	-607,498	-575,624	**-3,092,778**
Clay	-23,554,409	-23,012,658	-22,483,366	-21,966,249	-21,259,218	**-112,275,900**
Fayette	-5,800,223	-5,827,390	-5,854,557	-5,881,725	-7,800,424	**-31,164,319**
Grant	-3,542,550	-3,461,071	-3,381,467	-3,303,693	-3,195,359	**-16,884,140**
Greenbrier	-208,691	-203,891	-199,202	-194,620	-184,694	**-991,098**
Harrison	-692,719	-676,786	-661,220	-646,012	-574,336	**-3,251,073**
Kanawha	-152,193,716	-50,640,650	-50,943,078	-51,245,582	-59,348,054	**-364,371,080**
Lincoln	-1,460,530	-1,426,938	-1,394,118	-1,362,054	-1,318,219	**-6,961,859**
Logan	-26,556,537	-25,104,557	-48,844,816	2,746,139	-20,934,486	**-118,694,257**
Marshall	-4,143,343	-4,048,046	-3,954,941	-3,863,977	-3,661,248	**-19,671,555**
McDowell	-5,482,824	-5,184,696	-4,896,847	-4,622,704	-4,249,190	**-24,436,261**
Mineral	-318,480	-311,155	-243,073	92,790	90,007	**-689,911**
Mingo	-22,035,687	-19,918,941	-17,950,267	-16,129,663	-13,084,115	**-89,118,673**
Monongalia	-9,170,479	-8,959,558	-8,753,488	-8,552,158	-8,210,802	**-43,646,485**
Nicholas	-4,473,463	-4,473,462	-4,473,465	-4,473,464	-4,326,497	**-22,220,351**
Preston	-413,049	-403,549	-394,267	-385,199	-360,916	**-1,956,980**
Raleigh	-3,341,620	-3,497,975	-3,661,602	-3,828,864	-31,758,119	**-46,088,180**
Tucker	-576,525	-563,265	-550,310	-537,653	134,765	**-2,092,988**
Upshur	-871,501	-851,456	-831,873	-812,740	-769,917	**-4,137,487**
Wayne	-7,836,828	-7,656,581	-7,480,480	-7,308,429	-7,032,568	**-37,314,886**
Webster	-12,524,560	-12,236,495	-11,955,056	-11,680,089	-11,298,227	**-59,694,427**
Wyoming	-16,762,951	-15,252,170	-13,845,466	-12,532,766	-10,719,828	**-69,113,181**
State Remainder	-63,076,061	-58,598,331	-44,169,098	-38,748,992	-42,468,810	**-247,061,292**
TOTAL	**-447,279,726**	**-291,002,008**	**-294,309,789**	**-231,357,712**	**-286,910,220**	**-1,550,859,474**

Table A-8 State-Level Output Impacts

Simulation	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Baseline	-357,925,944	-163,571,719	-143,959,987	-138,942,873	-138,942,872	**-943,343,414**
Phase-In	-805,205,671	-454,573,730	-438,269,777	-370,300,591	-424,405,530	**-2,492,755,318**
Policy-Induced Difference	-447,279,726	-291,002,008	-294,309,789	-231,357,712	-286,910,220	**-1,550,859,474**

Table A-9 County-Level Baseline Income Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-413,068	-403,567	-394,285	-385,217	-373,660	**-1,969,797**
Boone	-4,609,275	-4,532,178	-4,456,917	-4,382,917	-4,309,148	**-22,290,435**
Braxton	-348,097	-340,091	-332,269	-324,627	-314,888	**-1,659,972**
Brooke	-580,697	-567,341	-554,292	-541,543	-525,297	**-2,769,170**
Clay	-1,898,473	-1,854,808	-1,812,148	-1,770,468	-1,717,354	**-9,053,251**
Fayette	44,275	-44,275	-44,275	-44,275	-864,801	**-953,351**
Grant	-371,932	-363,378	-355,020	-346,854	-336,449	**-1,773,633**
Greenbrier	-152,583	-149,074	-145,645	-142,295	-138,026	**-727,623**
Harrison	-2,210,339	-2,159,501	-2,109,833	-2,061,307	-1,999,467	**-10,540,447**
Kanawha	443,537	444,521	445,502	447,471	-6,749,412	**-4,968,381**
Lincoln	-95,385	-93,191	-91,048	-88,954	-86,285	**-454,863**
Logan	-32,521,199	-1,849,028	-1,797,747	-1,749,428	-1,701,108	**-39,618,510**
Marshall	-3,860,701	-3,771,905	-3,685,151	-3,600,393	-3,492,381	**-18,410,531**
McDowell	-1,094,854	-1,064,869	-1,035,740	-1,007,469	-980,056	**-5,182,988**
Mineral	-20,373	-19,904	-19,447	-18,999	-18,429	**-97,152**
Mingo	-8,902,604	-8,474,049	-8,067,471	-7,679,205	-7,310,172	**-40,433,501**
Monongalia	-3,523,744	-3,442,698	-3,363,516	-3,286,155	-3,187,570	**-16,803,683**
Nicholas	-20,987,632	-874,448	-835,146	-797,631	-761,904	**-24,256,761**
Preston	-462,933	-452,286	-441,883	-431,720	-418,768	**-2,207,590**
Raleigh	2,549,122	2,609,743	2,671,377	2,734,017	-5,319,511	**5,244,748**
Tucker	-45,182	-44,143	-43,128	-42,136	-40,872	**-215,461**
Upshur	-651,589	-636,602	-621,961	-607,656	-589,426	**-3,107,234**
Wayne	-2,331,718	-2,278,088	-2,225,692	-2,174,502	-2,109,266	**-11,119,266**
Webster	-1,285,603	-1,256,034	-1,227,145	-1,198,921	-1,162,953	**-6,130,656**
Wyoming	-4,189,529	-4,001,342	-3,820,605	-3,649,186	-3,484,289	**-19,144,951**
State Remainder	-12,750,896	-6,158,542	-5,959,112	-5,766,807	-6,953,817	**-37,589,174**
TOTAL	**-100,271,471**	**-41,777,076**	**-40,322,594**	**-38,917,173**	**-54,945,304**	**-276,233,637**

Table A-10 County-Level Phase-In Income Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-469,147	-458,357	-447,814	-437,515	-424,389	**-2,237,222**
Boone	-27,137,084	-14,964,081	-14,533,625	-14,144,180	-13,703,917	**-84,482,887**
Braxton	-456,582	-446,081	-435,821	-425,797	-413,023	**-2,177,304**
Brooke	-761,614	-744,097	-726,983	-710,262	-688,954	**-3,631,910**
Clay	-7,974,577	-7,791,162	-7,611,965	-7,436,890	-7,213,783	**-38,028,377**
Fayette	-1,564,697	-1,572,234	-1,579,770	-1,587,306	-2,119,610	**-8,423,617**
Grant	-1,304,448	-1,274,446	-1,245,133	-1,216,495	-1,180,001	**-6,220,523**
Greenbrier	-203,443	-198,764	-194,192	-189,726	-184,034	**-970,159**
Harrison	-2,401,469	-2,346,235	-2,292,272	-2,239,550	-2,172,363	**-11,451,889**
Kanawha	-43,595,458	-14,208,937	-14,295,402	-14,381,030	-16,725,521	**-103,206,348**
Lincoln	-401,278	-392,049	-383,031	-374,222	-362,995	**-1,913,575**
Logan	-39,988,314	-8,907,877	-15,531,824	-977,273	-7,635,756	**-73,041,044**
Marshall	-5,063,600	-4,947,137	-4,833,353	-4,722,186	-4,580,520	**-24,146,796**
McDowell	-2,465,563	-2,361,045	-2,259,952	-2,163,146	-2,069,769	**-11,319,475**
Mineral	-85,585	-83,617	-69,217	0	0	**-238,419**
Mingo	-14,898,721	-13,894,180	-12,951,908	-12,068,238	-11,239,515	**-65,052,562**
Monongalia	-6,011,611	-5,873,344	-5,738,257	-5,606,277	-5,438,089	**-28,667,578**
Nicholas	-22,102,352	-1,989,168	-1,949,865	-1,912,349	-1,875,731	**-29,829,465**
Preston	-561,110	-548,204	-535,596	-523,277	-507,579	**-2,675,766**
Raleigh	1,620,607	1,637,783	1,653,950	1,670,115	-6,090,411	**492,044**
Tucker	-189,932	-185,564	-181,296	-177,126	-7,035	**-740,953**
Upshur	-852,611	-833,001	-813,842	-795,124	-771,270	**-4,065,848**
Wayne	-4,438,982	-4,336,885	-4,237,137	-4,139,683	-4,015,492	**-21,168,179**
Webster	-4,626,800	-4,520,384	-4,416,415	-4,314,837	-4,185,392	**-22,063,828**
Wyoming	-8,841,145	-8,233,728	-7,662,637	-7,126,952	-6,623,876	**-38,488,338**
State Remainder	-30,816,169	-19,564,869	-19,514,566	-17,769,917	-18,718,028	**-106,383,549**
TOTAL	**-225,591,684**	**-119,037,661**	**-122,787,920**	**-103,769,239**	**-118,947,048**	**-690,133,571**

Table A-11 County-Level Policy-Induced Income Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-56,079	-54,789	-53,529	-52,298	-50,729	**-267,424**
Boone	-22,527,809	-10,431,903	-10,076,708	-9,761,263	-9,394,769	**-62,192,452**
Braxton	-108,485	-105,990	-103,552	-101,170	-98,135	**-517,332**
Brooke	-180,917	-176,756	-172,691	-168,719	-163,657	**-862,740**
Clay	-6,076,104	-5,936,354	-5,799,817	-5,666,422	-5,496,429	**-28,975,126**
Fayette	-1,608,972	-1,527,959	-1,535,495	-1,543,031	-1,254,809	**-7,470,266**
Grant	-932,516	-911,068	-890,114	-869,641	-843,552	**-4,446,891**
Greenbrier	-50,860	-49,690	-48,547	-47,431	-46,008	**-242,536**
Harrison	-191,130	-186,734	-182,439	-178,243	-172,896	**-911,442**
Kanawha	-44,038,995	-14,653,458	-14,740,904	-14,828,501	-9,976,109	**-98,237,967**
Lincoln	-305,893	-298,857	-291,984	-285,268	-276,710	**-1,458,712**
Logan	-7,467,115	-7,058,849	-13,734,077	772,155	-5,934,648	**-33,422,534**
Marshall	-1,202,899	-1,175,232	-1,148,202	-1,121,793	-1,088,140	**-5,736,266**
McDowell	-1,370,709	-1,296,176	-1,224,212	-1,155,677	-1,089,713	**-6,136,487**
Mineral	-65,212	-63,712	-49,770	18,999	18,429	**-141,266**
Mingo	-5,996,117	-5,420,131	-4,884,437	-4,389,033	-3,929,343	**-24,619,061**
Monongalia	-2,487,867	-2,430,646	-2,374,741	-2,320,122	-2,250,518	**-11,863,894**
Nicholas	-1,114,720	-1,114,720	-1,114,719	-1,114,718	-1,113,827	**-5,572,704**
Preston	-98,177	-95,919	-93,713	-91,557	-88,811	**-468,177**
Raleigh	-928,515	-971,960	-1,017,427	-1,063,902	-770,900	**-4,752,704**
Tucker	-144,750	-141,421	-138,168	-134,990	33,837	**-525,492**
Upshur	-201,022	-196,398	-191,881	-187,468	-181,844	**-958,613**
Wayne	-2,107,264	-2,058,797	-2,011,445	-1,965,181	-1,906,226	**-10,048,913**
Webster	-3,341,197	-3,264,349	-3,189,269	-3,115,916	-3,022,439	**-15,933,170**
Wyoming	-4,651,616	-4,232,386	-3,842,032	-3,477,766	-3,139,587	**-19,343,387**
State Remainder	-18,065,273	-13,406,327	-13,555,454	-12,003,110	-11,764,211	**-68,794,375**
TOTAL	**-125,320,212**	**-77,260,579**	**-82,465,324**	**-64,852,062**	**-64,001,739**	**-413,899,935**

Table A-12 State-Level Income Impacts

Simulation	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Baseline	-100,271,471	-41,777,076	-40,322,594	-38,917,173	-54,945,304	**-276,233,637**
Phase-In	-225,591,684	-119,037,661	-122,787,920	-103,769,239	-118,947,048	**-690,133,571**
Policy-Induced Difference	-125,320,212	-77,260,579	-82,465,324	-64,852,062	-64,001,739	**-413,899,935**

Appendix B - Impacts on Business and Personal Tax Collections

Table B-1 County-Level Baseline Severance Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-44,050	-43,046	-42,043	-41,040	-40,128	**-210,307**
Boone	-458,006	-450,346	-442,867	-435,480	-428,184	**-2,214,883**
Braxton	-31,646	-30,917	-30,187	-29,458	-28,819	**-151,027**
Brooke	-61,013	-59,645	-58,277	-56,909	-55,632	**-291,475**
Clay	-204,470	-199,728	-195,168	-190,699	-186,322	**-976,387**
Fayette	4,286	4,286	4,286	4,286	-83,722	**-66,576**
Grant	-38,760	-37,848	-36,936	-36,115	-35,294	**-184,954**
Greenbrier	-17,237	-16,872	-16,507	-16,142	-15,778	**-82,536**
Harrison	-213,499	-208,574	-203,741	-199,090	-194,530	**-1,019,434**
Kanawha	41,131	41,222	41,314	41,496	-625,906	**-460,742**
Lincoln	-14,045	-13,680	-13,406	-13,133	-12,859	**-67,123**
Logan	-3,007,594	-171,000	-166,258	-161,789	-157,320	**-3,663,960**
Marshall	-355,680	-347,472	-339,446	-331,603	-323,942	**-1,698,144**
McDowell	-116,554	-113,362	-110,261	-107,251	-104,333	**-551,760**
Mineral	-2,918	-2,827	-2,736	-2,645	-2,554	**-13,680**
Mingo	-886,646	-843,965	-803,472	-764,803	-728,050	**-4,026,936**
Monongalia	-342,456	-334,613	-326,952	-319,474	-312,086	**-1,635,581**
Nicholas	-93,486	-89,285	-85,272	-81,442	-77,794	**-427,278**
Preston	-50,981	-49,795	-48,610	-47,515	-46,421	**-243,322**
Raleigh	230,098	235,570	241,133	246,787	-480,168	**473,419**
Tucker	-5,563	-5,472	-5,381	-5,290	-5,198	**-26,904**
Upshur	-77,155	-75,422	-73,690	-71,957	-70,315	**-368,539**
Wayne	-237,941	-232,469	-227,088	-221,890	-216,782	**-1,136,170**
Webster	-131,693	-128,683	-125,765	-122,846	-120,019	**-629,006**
Wyoming	-410,126	-391,704	-374,011	-357,230	-341,088	**-1,874,160**
State Remainder	0	0	0	0	0	**0**
TOTAL	**-6,526,005**	**-3,565,646**	**-3,441,341**	**-3,321,230**	**-4,693,243**	**-21,547,466**

Table B-2 County-Level Phase-In Severance Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-52,987	-51,802	-50,616	-49,430	-48,336	**-253,171**
Boone	-2,696,510	-1,486,925	-1,444,152	-1,402,474	-1,361,707	**-8,391,768**
Braxton	-43,594	-42,590	-41,587	-40,675	-39,763	**-208,210**
Brooke	-84,086	-82,171	-80,256	-78,432	-76,608	**-401,554**
Clay	-1,063,392	-1,038,950	-1,015,056	-991,709	-968,909	**-5,078,016**
Fayette	-151,483	-152,213	-152,942	-153,672	-205,200	**-815,510**
Grant	-138,533	-135,341	-132,240	-129,230	-126,221	**-661,565**
Greenbrier	-24,168	-23,621	-23,074	-22,526	-21,979	**-115,368**
Harrison	-246,149	-240,494	-234,931	-229,550	-224,261	**-1,175,386**
Kanawha	-4,042,805	-1,317,658	-1,325,683	-1,333,618	-1,551,038	**-9,570,802**
Lincoln	-70,315	-68,674	-67,123	-65,573	-64,022	**-335,707**
Logan	-3,698,160	-823,810	-1,436,400	-90,379	-706,162	**-6,754,910**
Marshall	-490,109	-478,800	-467,765	-457,003	-446,515	**-2,340,192**
McDowell	-262,474	-251,347	-240,586	-230,280	-220,339	**-1,205,026**
Mineral	-15,139	-14,774	-9,915	0	0	**-39,829**
Mingo	-1,483,824	-1,383,778	-1,289,933	-1,201,925	-1,119,389	**-6,478,848**
Monongalia	-606,936	-592,982	-579,302	-565,987	-552,946	**-2,898,154**
Nicholas	-2,256,744	-203,102	-199,090	-195,259	-191,520	**-3,045,715**
Preston	-65,117	-63,658	-62,198	-60,739	-59,371	**-311,083**
Raleigh	146,285	147,835	149,294	150,754	-549,754	**44,414**
Tucker	-28,910	-28,272	-27,634	-26,995	-20,790	**-132,601**
Upshur	-106,066	-103,603	-101,232	-98,861	-96,581	**-506,342**
Wayne	-468,768	-458,006	-447,427	-437,122	-427,090	**-2,238,413**
Webster	-482,722	-471,595	-460,742	-450,163	-439,766	**-2,304,989**
Wyoming	-865,488	-806,026	-750,120	-697,680	-648,432	**-3,767,746**
State Remainder	0	0	0	0	0	**0**
TOTAL	**-19,298,194**	**-10,172,357**	**-10,490,710**	**-8,858,530**	**-10,166,699**	**-58,986,489**

Table B-3 County-Level Policy-Induced Severance Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-8,938	-8,755	-8,573	-8,390	-8,208	**-42,864**
Boone	-2,238,504	-1,036,579	-1,001,285	-966,994	-933,523	**-6,176,885**
Braxton	-11,947	-11,674	-11,400	-11,218	-10,944	**-57,182**
Brooke	-23,074	-22,526	-21,979	-21,523	-20,976	**-110,078**
Clay	-858,922	-839,222	-819,888	-801,010	-782,587	**-4,101,629**
Fayette	-155,770	-156,499	-157,229	-157,958	-121,478	**-748,934**
Grant	-99,773	-97,493	-95,304	-93,115	-90,926	**-476,611**
Greenbrier	-6,931	-6,749	-6,566	-6,384	-6,202	**-32,832**
Harrison	-32,650	-31,920	-31,190	-30,461	-29,731	**-155,952**
Kanawha	-4,083,936	-1,358,880	-1,366,997	-1,375,114	-925,133	**-9,110,059**
Lincoln	-56,270	-54,994	-53,717	-52,440	-51,163	**-268,584**
Logan	-690,566	-652,810	-1,270,142	71,410	-548,842	**-3,090,950**
Marshall	-134,429	-131,328	-128,318	-125,400	-122,573	**-642,048**
McDowell	-145,920	-137,986	-130,325	-123,029	-116,006	**-653,266**
Mineral	-12,221	-11,947	-7,179	2,645	2,554	**-26,149**
Mingo	-597,178	-539,813	-486,461	-437,122	-391,339	**-2,451,912**
Monongalia	-264,480	-258,370	-252,350	-246,514	-240,859	**-1,262,573**
Nicholas	-2,163,258	-113,818	-113,818	-113,818	-113,726	**-2,618,437**
Preston	-14,136	-13,862	-13,589	-13,224	-12,950	**-67,762**
Raleigh	-83,813	-87,734	-91,838	-96,034	-69,586	**-429,005**
Tucker	-23,347	-22,800	-22,253	-21,706	-15,592	**-105,697**
Upshur	-28,910	-28,181	-27,542	-26,904	-26,266	**-137,803**
Wayne	-230,827	-225,538	-220,339	-215,232	-210,307	**-1,102,243**
Webster	-351,029	-342,912	-334,978	-327,317	-319,747	**-1,675,982**
Wyoming	-455,362	-414,322	-376,109	-340,450	-307,344	**-1,893,586**
State Remainder	0	0	0	0	0	**0**
TOTAL	**-12,772,189**	**-6,606,710**	**-7,049,370**	**-5,537,299**	**-5,473,456**	**-37,439,024**

Table B-4 State-Level Severance Tax Impacts

Simulation	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Baseline	-6,526,005	-3,565,646	-3,441,341	-3,321,230	-4,693,243	**-21,547,466**
Phase-In	-19,298,194	-10,172,357	-10,490,710	-8,858,530	-10,166,699	**-58,986,489**
Policy-Induced Difference	-12,772,189	-6,606,710	-7,049,370	-5,537,299	-5,473,456	**-37,439,024**

Table B-5 County-Level Baseline Corporate Net Income Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-2,741	-2,678	-2,616	-2,556	-2,497	**-13,088**
Boone	-27,462	-27,003	-26,554	-26,111	-25,674	**-132,804**
Braxton	-1,875	-1,832	-1,790	-1,749	-1,709	**-8,955**
Brooke	-3,696	-3,611	-3,528	-3,447	-3,367	**-17,649**
Clay	-11,705	-11,436	-11,173	-10,916	-10,665	**-55,895**
Fayette	296	296	296	296	-5,772	**-4,588**
Grant	-2,450	-2,394	-2,339	-2,285	-2,232	**-11,700**
Greenbrier	-1,218	-1,190	-1,162	-1,136	-1,109	**-5,815**
Harrison	-16,811	-16,424	-16,046	-15,677	-15,316	**-80,274**
Kanawha	3,405	3,412	3,420	3,435	-51,809	**-38,137**
Lincoln	-740	-723	-706	-690	-674	**-3,533**
Logan	-223,871	-12,728	-12,375	-12,043	-11,710	**-272,727**
Marshall	-24,983	-24,409	-23,847	-23,299	-22,763	**-119,301**
McDowell	-7,833	-7,618	-7,410	-7,208	-7,012	**-37,081**
Mineral	-177	-173	-169	-165	-161	**-845**
Mingo	-57,533	-54,763	-52,136	-49,627	-47,242	**-261,301**
Monongalia	-28,340	-27,688	-27,051	-26,429	-25,821	**-135,329**
Nicholas	-7,116	-6,796	-6,490	-6,199	-5,921	**-32,522**
Preston	-3,742	-3,656	-3,572	-3,490	-3,410	**-17,870**
Raleigh	20,297	20,780	21,271	21,769	-42,356	**41,761**
Tucker	-334	-326	-319	-312	-304	**-1,595**
Upshur	-5,201	-5,082	-4,965	-4,851	-4,739	**-24,838**
Wayne	-15,254	-14,903	-14,560	-14,226	-13,898	**-72,841**
Webster	-8,232	-8,043	-7,858	-7,677	-7,501	**-39,311**
Wyoming	-26,331	-25,148	-24,012	-22,935	-21,899	**-120,325**
State Remainder	-155,953	-98,934	-95,768	-92,711	-102,839	**-546,205**
TOTAL	**-609,600**	**-333,070**	**-321,459**	**-310,239**	**-438,400**	**-2,012,768**

Table B-6 County-Level Phase-In Corporate Net Income Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-3,113	-3,042	-2,972	-2,903	-2,836	**-14,866**
Boone	-161,682	-89,156	-86,591	-84,092	-81,648	**-503,168**
Braxton	-2,460	-2,403	-2,348	-2,294	-2,241	**-11,746**
Brooke	-4,847	-4,736	-4,627	-4,520	-4,416	**-23,146**
Clay	-49,169	-48,038	-46,933	-45,854	-44,799	**-234,793**
Fayette	-10,444	-10,494	-10,544	-10,595	-14,147	**-56,224**
Grant	-8,593	-8,396	-8,203	-8,014	-7,830	**-41,035**
Greenbrier	-1,624	-1,586	-1,550	-1,514	-1,479	**-7,753**
Harrison	-18,264	-17,844	-17,434	-17,033	-16,641	**-87,215**
Kanawha	-334,643	-109,069	-109,733	-110,390	-128,387	**-792,223**
Lincoln	-3,111	-3,039	-2,970	-2,901	-2,835	**-14,856**
Logan	-275,274	-61,321	-106,919	-6,727	-52,563	**-502,805**
Marshall	-32,767	-32,014	-31,277	-30,558	-29,855	**-156,472**
McDowell	-17,639	-16,891	-16,168	-15,476	-14,808	**-80,982**
Mineral	-742	-725	-600	0	0	**-2,067**
Mingo	-96,283	-89,791	-83,701	-77,991	-72,635	**-420,401**
Monongalia	-48,349	-47,237	-46,150	-45,089	-44,052	**-230,877**
Nicholas	-171,769	-15,459	-15,153	-14,862	-14,577	**-231,820**
Preston	-4,535	-4,431	-4,329	-4,229	-4,132	**-21,655**
Raleigh	12,904	13,041	13,169	13,298	-48,494	**3,918**
Tucker	-1,405	-1,372	-1,341	-1,310	-1,249	**-6,677**
Upshur	-6,806	-6,650	-6,497	-6,347	-6,201	**-32,501**
Wayne	-29,040	-28,372	-27,719	-27,082	-26,459	**-138,672**
Webster	-29,627	-28,946	-28,280	-27,629	-26,994	**-141,476**
Wyoming	-55,566	-51,749	-48,160	-44,793	-41,631	**-241,898**
State Remainder	-465,498	-297,767	-300,214	-266,375	-276,669	**-1,606,523**
TOTAL	**-1,820,346**	**-967,485**	**-997,242**	**-845,279**	**-967,579**	**-5,597,932**

Table B-7 County-Level Policy-Induced Corporate Net Income Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-372	-364	-356	-347	-339	**-1,778**
Boone	-134,220	-62,153	-60,037	-57,981	-55,974	**-370,364**
Braxton	-585	-571	-558	-545	-532	**-2,791**
Brooke	-1,151	-1,125	-1,099	-1,073	-1,049	**-5,497**
Clay	-37,464	-36,602	-35,760	-34,938	-34,134	**-178,898**
Fayette	-10,740	-10,790	-10,840	-10,891	-8,375	**-51,636**
Grant	-6,143	-6,002	-5,864	-5,729	-5,598	**-29,335**
Greenbrier	-406	-396	-388	-378	-370	**-1,938**
Harrison	-1,453	-1,420	-1,388	-1,356	-1,325	**-6,941**
Kanawha	-338,048	-112,481	-113,153	-113,825	-76,578	**-754,086**
Lincoln	-2,371	-2,316	-2,264	-2,211	-2,161	**-11,323**
Logan	-51,403	-48,593	-94,544	5,316	-40,853	**-230,078**
Marshall	-7,784	-7,605	-7,430	-7,259	-7,092	**-37,171**
McDowell	-9,806	-9,273	-8,758	-8,268	-7,796	**-43,901**
Mineral	-565	-552	-431	165	161	**-1,222**
Mingo	-38,750	-35,028	-31,565	-28,364	-25,393	**-159,100**
Monongalia	-20,009	-19,549	-19,099	-18,660	-18,231	**-95,548**
Nicholas	-164,653	-8,663	-8,663	-8,663	-8,656	**-199,298**
Preston	-793	-775	-757	-739	-722	**-3,785**
Raleigh	-7,393	-7,739	-8,102	-8,471	-6,138	**-37,843**
Tucker	-1,071	-1,046	-1,022	-998	-945	**-5,082**
Upshur	-1,605	-1,568	-1,532	-1,496	-1,462	**-7,663**
Wayne	-13,786	-13,469	-13,159	-12,856	-12,561	**-65,831**
Webster	-21,395	-20,903	-20,422	-19,952	-19,493	**-102,165**
Wyoming	-29,235	-26,601	-24,148	-21,858	-19,732	**-121,573**
State Remainder	-309,545	-198,833	-204,446	-173,664	-173,830	**-1,060,318**
TOTAL	**-1,210,746**	**-634,415**	**-675,783**	**-535,040**	**-529,179**	**-3,585,164**

Table B-8 State-Level Corporate Net Income Tax Impacts

Simulation	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Baseline	-609,600	-333,070	-321,459	-310,239	-438,400	**-2,012,768**
Phase-In	-1,820,346	-967,485	-997,242	-845,279	-967,579	**-5,597,932**
Policy-Induced Difference	-1,210,746	-634,415	-675,783	-535,040	-529,179	**-3,585,164**

Table B-9 County-Level Baseline Business Franchise Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-2,047	-2,000	-1,954	-1,909	-1,865	**-9,775**
Boone	-21,000	-20,648	-20,306	-19,967	-19,632	**-101,553**
Braxton	-1,333	-1,302	-1,272	-1,243	-1,214	**-6,364**
Brooke	-2,798	-2,734	-2,671	-2,609	-2,549	**-13,361**
Clay	-8,987	-8,780	-8,578	-8,381	-8,188	**-42,914**
Fayette	213	213	213	213	-4,154	**-3,302**
Grant	-1,818	-1,776	-1,735	-1,695	-1,656	**-8,680**
Greenbrier	-856	-836	-817	-798	-780	**-4,087**
Harrison	-11,540	-11,274	-11,015	-10,762	-10,514	**-55,105**
Kanawha	2,310	2,315	2,320	2,331	-35,155	**-25,879**
Lincoln	-569	-556	-543	-531	-519	**-2,718**
Logan	-160,575	-9,130	-8,876	-8,638	-8,399	**-195,618**
Marshall	-17,946	-17,534	-17,130	-16,736	-16,351	**-85,697**
McDowell	-5,776	-5,618	-5,464	-5,315	-5,170	**-27,343**
Mineral	-130	-127	-124	-121	-118	**-620**
Mingo	-42,829	-40,767	-38,811	-36,943	-35,168	**-194,518**
Monongalia	-19,357	-18,911	-18,476	-18,052	-17,636	**-92,432**
Nicholas	-3,315	-4,852	-4,634	-4,426	-4,227	**-21,454**
Preston	-2,629	-2,569	-2,510	-2,452	-2,395	**-12,555**
Raleigh	13,870	14,200	14,535	14,876	-28,945	**28,536**
Tucker	-248	-243	-237	-232	-226	**-1,186**
Upshur	-3,781	-3,694	-3,609	-3,526	-3,445	**-18,055**
Wayne	-11,320	-11,059	-10,805	-10,556	-10,314	**-54,054**
Webster	-6,235	-6,092	-5,952	-5,815	-5,681	**-29,775**
Wyoming	-19,624	-18,743	-17,093	-17,093	-16,321	**-88,874**
State Remainder	-75,312	-48,018	-47,302	-45,038	-49,654	**-265,324**
TOTAL	**-403,632**	**-220,535**	**-212,846**	**-205,418**	**-290,276**	**-1,332,707**

Table B-10 County-Level Phase-In Business Franchise Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-2,325	-2,271	-2,219	-2,168	-2,168	**-11,152**
Boone	-123,636	-68,176	-66,215	-64,304	-64,304	**-386,635**
Braxton	-1,748	-1,708	-1,669	-1,630	-1,630	**-8,385**
Brooke	-3,670	-3,585	-3,503	-3,422	-3,422	**-17,603**
Clay	-37,750	-36,882	-36,034	-35,205	-35,205	**-181,075**
Fayette	-7,517	-7,553	-7,589	-7,625	-7,625	**-37,910**
Grant	-6,375	-6,229	-6,085	-5,945	-5,945	**-30,579**
Greenbrier	-1,141	-1,115	-1,089	-1,064	-1,064	**-5,474**
Harrison	-12,538	-12,249	-11,967	-11,692	-11,692	**-60,139**
Kanawha	-227,070	-74,008	-74,459	-74,905	-74,905	**-525,346**
Lincoln	-2,394	-2,339	-2,286	-2,233	-2,233	**-11,485**
Logan	-197,445	-43,983	-76,689	-4,825	-4,825	**-327,768**
Marshall	-23,538	-22,997	-22,468	-21,951	-21,951	**-112,904**
McDowell	-13,007	-12,456	-11,922	-11,412	-11,412	**-60,209**
Mineral	-545	-532	-441	0	0	**-1,518**
Mingo	-71,675	-66,842	-62,309	-58,058	-58,058	**-316,943**
Monongalia	-33,023	-32,264	-31,521	-30,796	-30,796	**-158,401**
Nicholas	-122,636	-11,037	-10,819	-10,611	-10,611	**-165,714**
Preston	-3,186	-3,113	-3,041	-2,971	-2,971	**-15,283**
Raleigh	8,818	8,912	8,999	9,087	9,087	**44,904**
Tucker	-1,044	-1,020	-997	-974	-974	**-5,008**
Upshur	-4,947	-4,833	-4,722	-4,614	-4,614	**-23,730**
Wayne	-21,550	-21,054	-20,570	-20,097	-20,097	**-103,367**
Webster	-22,440	-21,924	-21,420	-20,927	-20,927	**-107,638**
Wyoming	-41,413	-38,568	-35,893	-33,384	-33,384	**-182,641**
State Remainder	-231,505	-152,771	-153,373	-137,956	-137,956	**-813,561**
TOTAL	**-1,205,300**	**-640,598**	**-660,301**	**-559,682**	**-559,682**	**-3,625,563**

Table B-11 County-Level Policy-Induced Business Franchise Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-278	-271	-265	-259	-303	**-1,377**
Boone	-102,636	-47,528	-45,909	-44,337	-44,672	**-285,082**
Braxton	-415	-406	-397	-387	-416	**-2,021**
Brooke	-872	-851	-832	-813	-873	**-4,242**
Clay	-28,763	-28,102	-27,456	-26,824	-27,017	**-138,161**
Fayette	-7,730	-7,766	-7,802	-7,838	-3,471	**-34,608**
Grant	-4,557	-4,453	-4,350	-4,250	-4,289	**-21,899**
Greenbrier	-285	-279	-272	-266	-284	**-1,387**
Harrison	-998	-975	-952	-930	-1,178	**-5,034**
Kanawha	-229,380	-76,323	-76,779	-77,236	-39,750	**-499,467**
Lincoln	-1,825	-1,783	-1,743	-1,702	-1,714	**-8,767**
Logan	-36,870	-34,853	-67,813	3,813	3,574	**-132,150**
Marshall	-5,592	-5,463	-5,338	-5,215	-5,600	**-27,207**
McDowell	-7,231	-6,838	-6,458	-6,097	-6,242	**-32,866**
Mineral	-415	-405	-317	121	118	**-898**
Mingo	-28,846	-26,075	-23,498	-21,115	-22,890	**-122,425**
Monongalia	-13,666	-13,353	-13,045	-12,744	-13,160	**-65,969**
Nicholas	-119,321	-6,185	-6,185	-6,185	-6,384	**-144,260**
Preston	-557	-544	-531	-519	-576	**-2,728**
Raleigh	-5,052	-5,288	-5,536	-5,789	38,032	**16,368**
Tucker	-796	-777	-760	-742	-748	**-3,822**
Upshur	-1,166	-1,139	-1,113	-1,088	-1,169	**-5,675**
Wayne	-10,230	-9,995	-9,765	-9,541	-9,783	**-49,313**
Webster	-16,205	-15,832	-15,468	-15,112	-15,246	**-77,863**
Wyoming	-21,789	-19,825	-18,800	-16,291	-17,063	**-93,767**
State Remainder	-156,193	-104,753	-106,071	-92,918	-88,302	**-548,237**
TOTAL	**-801,668**	**-420,063**	**-447,455**	**-354,264**	**-269,406**	**-2,292,856**

Table B-12 State-Level Business Franchise Tax Impacts

Simulation	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Baseline	-403,632	-220,535	-212,846	-205,418	-290,276	**-1,332,707**
Phase-In	-1,205,300	-640,598	-660,301	-559,682	-559,682	**-3,625,563**
Policy-Induced Difference	-801,668	-420,063	-447,455	-354,264	-269,406	**-2,292,856**

Table B-13 County-Level Baseline Personal Income Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-12,103	-11,825	-11,553	-11,287	-10,948	**-57,715**
Boone	-135,052	-132,793	-130,588	-128,419	-126,258	**-653,110**
Braxton	-10,199	-9,965	-9,735	-9,512	-9,226	**-48,637**
Brooke	-17,014	-16,623	-16,241	-15,867	-15,391	**-81,137**
Clay	-55,625	-54,346	-53,096	-51,875	-50,318	**-265,260**
Fayette	1,297	1,297	1,297	1,297	-25,339	**-20,150**
Grant	-10,898	-10,647	-10,402	-10,163	-9,858	**-51,967**
Greenbrier	-4,471	-4,368	-4,267	-4,169	-4,044	**-21,319**
Harrison	-64,763	-63,273	-61,818	-60,396	-58,584	**-308,835**
Kanawha	12,996	13,024	13,053	13,111	-197,758	**-145,574**
Lincoln	-2,795	-2,731	-2,668	-2,606	-2,528	**-13,327**
Logan	-952,871	-54,177	-52,674	-51,258	-49,842	**-1,160,822**
Marshall	-113,119	-110,517	-107,975	-105,492	-102,327	**-539,429**
McDowell	-32,079	-31,201	-30,347	-29,519	-28,716	**-151,862**
Mineral	-597	-583	-570	-557	-540	**-2,847**
Mingo	-260,846	-248,290	-236,377	-225,001	-214,188	**-1,184,702**
Monongalia	-103,246	-100,871	-98,551	-96,284	-93,396	**-492,348**
Nicholas	-26,827	-25,621	-24,470	-23,371	-22,324	**-122,613**
Preston	-13,564	-13,252	-12,947	-12,649	-12,270	**-64,682**
Raleigh	74,689	76,465	78,271	80,107	-155,862	**153,671**
Tucker	-1,324	-1,293	-1,264	-1,235	-1,198	**-6,313**
Upshur	-19,092	-18,652	-18,223	-17,804	-17,270	**-91,042**
Wayne	-68,319	-66,748	-65,213	-63,713	-61,802	**-325,795**
Webster	-37,668	-36,802	-35,955	-35,128	-34,075	**-179,628**
Wyoming	-122,753	-117,239	-111,944	-106,921	-102,090	**-560,947**
State Remainder	-256,224	-176,141	-170,391	-164,847	-199,351	**-966,953**
TOTAL	**-2,232,467**	**-1,217,170**	**-1,174,646**	**-1,133,558**	**-1,605,501**	**-7,363,342**

Table B-14 County-Level Phase-In Personal Income Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-13,746	-13,430	-13,121	-12,819	-12,435	**-65,551**
Boone	-795,117	-438,448	-425,835	-414,424	-401,525	**-2,475,349**
Braxton	-13,378	-13,070	-12,770	-12,476	-12,102	**-63,795**
Brooke	-22,315	-21,802	-21,301	-20,811	-20,186	**-106,415**
Clay	-233,655	-228,281	-223,031	-217,901	-211,364	**-1,114,231**
Fayette	-45,846	-46,066	-46,287	-46,508	-62,105	**-246,812**
Grant	-38,220	-37,341	-36,482	-35,643	-34,574	**-182,261**
Greenbrier	-5,961	-5,824	-5,690	-5,559	-5,392	**-28,426**
Harrison	-70,363	-68,745	-67,164	-65,619	-63,650	**-335,540**
Kanawha	-1,277,347	-416,322	-418,855	-421,364	-490,058	**-3,023,946**
Lincoln	-11,757	-11,487	-11,223	-10,965	-10,636	**-56,068**
Logan	-1,171,658	-261,001	-455,082	-28,634	-223,728	**-2,140,103**
Marshall	-148,363	-144,951	-141,617	-138,360	-134,209	**-707,501**
McDowell	-72,241	-69,179	-66,217	-63,380	-60,644	**-331,661**
Mineral	-2,508	-2,450	-2,028	0	0	**-6,986**
Mingo	-436,533	-407,099	-379,491	-353,599	-329,318	**-1,906,040**
Monongalia	-176,140	-172,089	-168,131	-164,264	-159,336	**-839,960**
Nicholas	-647,599	-58,283	-57,131	-56,032	-54,959	**-874,004**
Preston	-16,441	-16,062	-15,693	-15,332	-14,872	**-78,400**
Raleigh	47,484	47,987	48,461	48,934	-178,449	**14,417**
Tucker	-5,565	-5,437	-5,312	-5,190	-206	**-21,710**
Upshur	-24,982	-24,407	-23,846	-23,297	-22,598	**-119,129**
Wayne	-130,062	-127,071	-124,148	-121,293	-117,654	**-620,228**
Webster	-135,565	-132,447	-129,401	-126,425	-122,632	**-646,470**
Wyoming	-259,046	-241,248	-224,515	-208,820	-194,080	**-1,127,708**
State Remainder	-894,754	-565,287	-564,007	-513,081	-540,681	**-3,077,809**
TOTAL	**-6,601,677**	**-3,479,839**	**-3,589,916**	**-3,032,861**	**-3,477,392**	**-20,181,685**

Table B-15 County-Level Policy-Induced Personal Income Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-1,643	-1,605	-1,568	-1,532	-1,486	**-7,836**
Boone	-660,065	-305,655	-295,248	-286,005	-275,267	**-1,822,239**
Braxton	-3,179	-3,106	-3,034	-2,964	-2,875	**-15,158**
Brooke	-5,301	-5,179	-5,060	-4,943	-4,795	**-25,278**
Clay	-178,030	-173,935	-169,935	-166,026	-161,045	**-848,971**
Fayette	-47,143	-47,364	-47,585	-47,805	-36,766	**-226,662**
Grant	-27,323	-26,694	-26,080	-25,480	-24,716	**-130,294**
Greenbrier	-1,490	-1,456	-1,422	-1,390	-1,348	**-7,106**
Harrison	-5,600	-5,471	-5,345	-5,223	-5,066	**-26,705**
Kanawha	-1,290,343	-429,346	-431,908	-434,475	-292,300	**-2,878,372**
Lincoln	-8,963	-8,757	-8,555	-8,358	-8,108	**-42,740**
Logan	-218,786	-206,824	-402,408	22,624	-173,885	**-979,280**
Marshall	-35,245	-34,434	-33,642	-32,869	-31,882	**-168,073**
McDowell	-40,162	-37,978	-35,869	-33,861	-31,929	**-179,799**
Mineral	-1,911	-1,867	-1,458	557	540	**-4,139**
Mingo	-175,686	-158,810	-143,114	-128,599	-115,130	**-721,338**
Monongalia	-72,895	-71,218	-69,580	-67,980	-65,940	**-347,612**
Nicholas	-620,772	-32,661	-32,661	-32,661	-32,635	**-751,391**
Preston	-2,877	-2,810	-2,746	-2,683	-2,602	**-13,718**
Raleigh	-27,205	-28,478	-29,811	-31,172	-22,587	**-139,254**
Tucker	-4,241	-4,144	-4,048	-3,955	991	**-15,397**
Upshur	-5,890	-5,754	-5,622	-5,493	-5,328	**-28,087**
Wayne	-61,743	-60,323	-58,935	-57,580	-55,852	**-294,433**
Webster	-97,897	-95,645	-93,446	-91,296	-88,557	**-466,842**
Wyoming	-136,292	-124,009	-112,572	-101,899	-91,990	**-566,761**
State Remainder	-638,530	-389,145	-393,616	-348,234	-341,331	**-2,110,856**
TOTAL	**-4,369,210**	**-2,262,670**	**-2,415,270**	**-1,899,303**	**-1,871,890**	**-12,818,343**

Table B-16 State-Level Personal Income Tax Impacts

Simulation	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Baseline	-2,232,467	-1,217,170	-1,174,646	-1,133,558	-1,605,501	**-7,363,342**
Phase-In	-6,601,677	-3,479,839	-3,589,916	-3,032,861	-3,477,392	**-20,181,685**
Policy-Induced Difference	-4,369,210	-2,262,670	-2,415,270	-1,899,303	-1,871,890	**-12,818,343**

Table B-17 County-Level Baseline Sales & Use Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-11,979	-11,703	-11,434	-11,171	-10,836	**-57,124**
Boone	-133,669	-131,433	-129,251	-127,105	-124,965	**-646,423**
Braxton	-10,095	-9,863	-9,636	-9,414	-9,132	**-48,139**
Brooke	-16,840	-16,453	-16,074	-15,705	-15,234	**-80,306**
Clay	-55,056	-53,789	-52,552	-51,344	-49,803	**-262,544**
Fayette	1,284	1,284	1,284	1,284	-25,079	**-19,943**
Grant	-10,786	-10,538	-10,296	-10,059	-9,757	**-51,435**
Greenbrier	-4,425	-4,323	-4,224	-4,127	-4,003	**-21,101**
Harrison	-64,100	-62,626	-61,185	-59,778	-57,985	**-305,673**
Kanawha	12,863	12,891	12,920	12,977	-195,733	**-144,083**
Lincoln	-2,766	-2,703	-2,640	-2,580	-2,502	**-13,191**
Logan	-943,115	-53,622	-52,135	-50,733	-49,332	**-1,148,937**
Marshall	-111,960	-109,385	-106,869	-104,411	-101,279	**-533,905**
McDowell	-31,751	-30,881	-30,036	-29,217	-28,422	**-150,307**
Mineral	-591	-577	-564	-551	-534	**-2,817**
Mingo	-258,176	-245,747	-233,957	-222,697	-211,995	**-1,172,572**
Monongalia	-102,189	-99,838	-97,542	-95,298	-92,440	**-487,307**
Nicholas	-26,552	-25,359	-24,219	-23,131	-22,095	**-121,357**
Preston	-13,425	-13,116	-12,815	-12,520	-12,144	**-64,020**
Raleigh	73,925	75,683	77,470	79,286	-154,266	**152,098**
Tucker	-1,310	-1,280	-1,251	-1,222	-1,185	**-6,248**
Upshur	-18,896	-18,461	-18,037	-17,622	-17,093	**-90,110**
Wayne	-67,620	-66,065	-64,545	-63,061	-61,169	**-322,459**
Webster	-37,282	-36,425	-35,587	-34,769	-33,726	**-177,789**
Wyoming	-121,496	-116,039	-110,798	-105,826	-101,044	**-555,204**
State Remainder	-253,601	-174,338	-168,646	-163,159	-197,309	**-957,053**
TOTAL	**-2,209,609**	**-1,204,707**	**-1,162,619**	**-1,121,952**	**-1,589,063**	**-7,287,949**

Table B-18 County-Level Phase-In Sales & Use Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-13,605	-13,292	-12,987	-12,688	-12,307	**-64,879**
Boone	-786,975	-433,958	-421,475	-410,181	-397,414	**-2,450,004**
Braxton	-13,241	-12,936	-12,639	-12,348	-11,978	**-63,142**
Brooke	-22,087	-21,579	-21,082	-20,598	-19,980	**-105,325**
Clay	-231,263	-225,944	-220,747	-215,670	-209,200	**-1,102,823**
Fayette	-45,376	-45,595	-45,813	-46,032	-61,469	**-244,285**
Grant	-37,829	-36,959	-36,109	-35,278	-34,220	**-180,395**
Greenbrier	-5,900	-5,764	-5,632	-5,502	-5,337	**-28,135**
Harrison	-69,643	-68,041	-66,476	-64,947	-62,999	**-332,105**
Kanawha	-1,264,268	-412,059	-414,567	-417,050	-485,040	**-2,992,984**
Lincoln	-11,637	-11,369	-11,108	-10,852	-10,527	**-55,494**
Logan	-1,159,661	-258,328	-450,423	-28,341	-221,437	**-2,118,190**
Marshall	-146,844	-143,467	-140,167	-136,943	-132,835	**-700,257**
McDowell	-71,501	-68,470	-65,539	-62,731	-60,023	**-328,265**
Mineral	-2,482	-2,425	-2,007	0	0	**-6,914**
Mingo	-432,063	-402,931	-375,605	-349,979	-325,946	**-1,886,524**
Monongalia	-174,337	-170,327	-166,409	-162,582	-157,705	**-831,360**
Nicholas	-640,969	-57,686	-56,546	-55,458	-54,396	**-865,055**
Preston	-16,272	-15,898	-15,532	-15,175	-14,720	**-77,597**
Raleigh	46,998	47,496	47,965	48,433	-176,622	**14,269**
Tucker	-5,508	-5,381	-5,258	-5,137	-204	**-21,488**
Upshur	-24,726	-24,157	-23,601	-23,059	-22,367	**-117,910**
Wayne	-128,730	-125,770	-122,877	-120,051	-116,449	**-613,877**
Webster	-134,177	-131,091	-128,076	-125,130	-121,376	**-639,851**
Wyoming	-256,393	-238,778	-222,216	-206,682	-192,092	**-1,116,162**
State Remainder	-885,593	-559,499	-558,232	-507,827	-535,145	**-3,046,296**
TOTAL	**-6,534,083**	**-3,444,210**	**-3,553,159**	**-3,001,808**	**-3,441,787**	**-19,975,047**

Table B-19 County-Level Policy-Induced Sales & Use Tax Impacts

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-1,626	-1,589	-1,552	-1,517	-1,471	**-7,755**
Boone	-653,306	-302,525	-292,225	-283,077	-272,448	**-1,803,581**
Braxton	-3,146	-3,074	-3,003	-2,934	-2,846	**-15,003**
Brooke	-5,247	-5,126	-5,008	-4,893	-4,746	**-25,019**
Clay	-176,207	-172,154	-168,195	-164,326	-159,396	**-840,279**
Fayette	-46,660	-46,879	-47,097	-47,316	-36,389	**-224,342**
Grant	-27,043	-26,421	-25,813	-25,220	-24,463	**-128,960**
Greenbrier	-1,475	-1,441	-1,408	-1,375	-1,334	**-7,034**
Harrison	-5,543	-5,415	-5,291	-5,169	-5,014	**-26,432**
Kanawha	-1,277,131	-424,950	-427,486	-430,027	-289,307	**-2,848,901**
Lincoln	-8,871	-8,667	-8,468	-8,273	-8,025	**-42,303**
Logan	-216,546	-204,707	-398,288	22,392	-172,105	**-969,253**
Marshall	-34,884	-34,082	-33,298	-32,532	-31,556	**-166,352**
McDowell	-39,751	-37,589	-35,502	-33,515	-31,602	**-177,958**
Mineral	-1,891	-1,848	-1,443	551	534	**-4,097**
Mingo	-173,887	-157,184	-141,649	-127,282	-113,951	**-713,953**
Monongalia	-72,148	-70,489	-68,867	-67,284	-65,265	**-344,053**
Nicholas	-614,416	-32,327	-32,327	-32,327	-32,301	**-743,698**
Preston	-2,847	-2,782	-2,718	-2,655	-2,576	**-13,577**
Raleigh	-26,927	-28,187	-29,505	-30,853	-22,356	**-137,828**
Tucker	-4,198	-4,101	-4,007	-3,915	981	**-15,239**
Upshur	-5,830	-5,696	-5,565	-5,437	-5,273	**-27,800**
Wayne	-61,111	-59,705	-58,332	-56,990	-55,281	**-291,418**
Webster	-96,895	-94,666	-92,489	-90,362	-87,651	**-462,062**
Wyoming	-134,897	-122,739	-111,419	-100,855	-91,048	**-560,958**
State Remainder	-631,992	-385,161	-389,586	-344,669	-337,836	**-2,089,243**
TOTAL	**-4,324,474**	**-2,239,502**	**-2,390,540**	**-1,879,856**	**-1,852,724**	**-12,687,097**

Table B-20 State-Level Sales & Use Tax Impacts

Simulation	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Baseline	-2,209,609	-1,204,707	-1,162,619	-1,121,952	-1,589,063	**-7,287,949**
Phase-In	-6,534,083	-3,444,210	-3,553,159	-3,001,808	-3,441,787	**-19,975,047**
Policy-Induced Difference	-4,324,474	-2,239,502	-2,390,540	-1,879,856	-1,852,724	**-12,687,097**

Table B-21 State-Level Baseline Business and Personal Tax Impacts (in thousands)

Tax	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
			BASELINE			
Severance Tax	-6,526	-3,566	-3,441	-3,321	-4,693	**-21,547**
CNIT	-610	-333	-321	-310	-438	**-2,013**
BFT	-404	-221	-213	-205	-290	**-1,333**
PIT	-2,232	-1,217	-1,175	-1,134	-1,606	**-7,363**
Sales and Use	-2,210	-1,205	-1,163	-1,122	-1,589	**-7,288**
State Total	**-11,981**	**-6,541**	**-6,313**	**-6,092**	**-8,616**	**-39,544**
			PHASE-IN			
Severance Tax	-19,298	-10,172	-10,491	-8,859	-10,167	-58,986
CNIT	-1,820	-967	-997	-845	-968	**-5,598**
BFT	-1,205	-641	-660	-560	-560	**-3,626**
PIT	-6,602	-3,480	-3,590	-3,033	-3,477	**-20,182**
Sales and Use	-6,534	-3,444	-3,553	-3,002	-3,442	**-19,975**
State Total	**-35,460**	**-18,704**	**-19,291**	**-16,298**	**-18,613**	**-108,367**
			POLICY-INDUCED CHANGES			
Severance Tax	-12,772	-6,607	-7,049	-5,537	-5,473	**-37,439**
CNIT	-1,211	-634	-676	-535	-529	**-3,585**
BFT	-802	-420	-447	-354	-269	**-2,293**
PIT	-4,369	-2,263	-2,415	-1,899	-1,872	**-12,818**
Sales and Use	-4,324	-2,240	-2,391	-1,880	-1,853	**-12,687**
State Total	**-23,478**	**-12,163**	**-12,978**	**-10,206**	**-9,997**	**-68,822**

Appendix C - Impacts on Property Tax Collection

Table C-1 County-Level Baseline Total Assessed Real and Personal Property (in millions)

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	8.14	5.40	5.07	4.75	4.43	**27.80**
Boone	454.72	467.96	460.71	453.58	446.57	**2,283.55**
Braxton	5.25	5.32	5.17	5.03	4.89	**25.65**
Brooke	17.93	18.92	18.25	17.59	16.96	**89.65**
Clay	20.59	18.60	17.87	17.16	16.46	**90.68**
Fayette	48.65	65.68	65.75	65.83	65.90	**311.80**
Grant	10.73	12.93	12.18	11.45	10.74	**58.04**
Greenbrier	6.29	7.36	7.11	6.87	6.63	**34.27**
Harrison	7.78	7.99	7.74	7.49	7.24	**38.24**
Kanawha	129.18	128.83	129.21	129.60	129.99	**646.82**
Lincoln	28.61	31.87	31.67	31.49	31.30	**154.94**
Logan	85.29	62.59	46.67	44.98	43.33	**282.86**
Marshall	53.38	51.91	50.09	48.30	46.56	**250.24**
McDowell	51.25	48.97	47.55	46.17	44.83	**238.77**
Mineral	2.53	2.31	2.14	1.97	1.81	**10.75**
Mingo	176.12	177.66	169.84	162.39	155.31	**841.32**
Monongalia	55.60	56.20	54.41	52.65	50.94	**269.80**
Nicholas	142.47	150.89	147.96	145.15	142.47	**728.94**
Preston	13.07	11.83	11.29	10.76	10.25	**57.19**
Raleigh	136.57	134.93	138.21	141.57	145.01	**696.29**
Tucker	0.62	0.55	0.53	0.51	0.49	**2.70**
Upshur	9.60	9.56	9.28	9.01	8.75	**46.20**
Wayne	14.73	14.18	13.69	13.21	12.73	**68.54**
Webster	37.38	38.34	37.16	36.01	34.88	**183.77**
Wyoming	89.58	88.05	84.13	80.38	76.80	**418.95**
State Remainder						
TOTAL	**1,569.95**	**1,618.84**	**1,573.68**	**1,543.90**	**1,515.28**	**7,821.64**

Table C-2 County-Level Phase-In Total Assessed Real and Personal Property (in millions)

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	8.14	5.37	5.01	4.65	4.30	**27.46**
Boone	454.72	450.09	434.57	419.45	404.72	**2,163.57**
Braxton	5.25	5.29	5.12	4.94	4.78	**25.38**
Brooke	17.93	18.79	17.99	17.22	16.46	**88.40**
Clay	20.59	17.05	14.81	12.62	10.48	**75.55**
Fayette	48.65	64.34	63.07	61.79	60.51	**298.35**
Grant	10.73	11.96	10.26	8.60	6.97	**48.52**
Greenbrier	6.29	7.31	7.01	6.72	6.44	**33.77**
Harrison	7.78	7.97	7.70	7.43	7.17	**38.05**
Kanawha	129.18	109.54	103.51	97.44	91.34	**531.01**
Lincoln	28.61	31.48	30.90	30.33	29.78	**151.10**
Logan	85.29	59.13	39.94	31.88	30.60	**246.84**
Marshall	53.38	51.56	49.40	47.28	45.21	**246.83**
McDowell	51.25	48.07	45.80	43.62	41.52	**230.26**
Mineral	2.53	1.94	1.41	0.89	0.39	**7.15**
Mingo	176.12	174.96	164.70	155.06	146.00	**816.84**
Monongalia	55.60	55.50	53.02	50.60	48.23	**262.94**
Nicholas	142.47	116.14	111.38	106.75	102.24	**578.97**
Preston	13.07	11.75	11.14	10.54	9.95	**56.44**
Raleigh	136.57	134.34	137.00	139.71	142.47	**690.10**
Tucker	0.62	0.50	0.43	0.36	0.29	**2.21**
Upshur	9.60	9.51	9.18	8.86	8.54	**45.68**
Wayne	14.73	13.94	13.21	12.50	11.80	**66.18**
Webster	37.38	36.75	34.01	31.34	28.73	**168.22**
Wyoming	89.58	85.82	79.87	74.29	69.05	**398.61**
State Remainder						
TOTAL	**1,569.95**	**1,529.11**	**1,450.43**	**1,384.87**	**1,327.97**	**7,262.33**

Table C-3 County-Level Policy-Induced Total Assessed Real and Personal Property
(in millions)

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	0	-0.03	-0.07	-0.10	-0.13	**-0.33**
Boone	0	-17.87	-26.14	-34.13	-41.85	**-119.98**
Braxton	0	-0.03	-0.06	-0.08	-0.11	**-0.28**
Brooke	0	-0.13	-0.25	-0.37	-0.49	**-1.25**
Clay	0	-1.55	-3.06	-4.54	-5.98	**-15.13**
Fayette	0	-1.34	-2.68	-4.04	-5.39	**-13.45**
Grant	0	-0.97	-1.93	-2.86	-3.77	**-9.52**
Greenbrier	0	-0.05	-0.10	-0.15	-0.19	**-0.49**
Harrison	0	-0.02	-0.04	-0.06	-0.08	**-0.19**
Kanawha	0	-19.29	-25.71	-32.16	-38.66	**-115.81**
Lincoln	0	-0.39	-0.78	-1.15	-1.52	**-3.84**
Logan	0	-3.46	-6.73	-13.09	-12.74	**-36.02**
Marshall	0	-0.35	-0.69	-1.02	-1.35	**-3.41**
McDowell	0	-0.90	-1.75	-2.55	-3.31	**-8.51**
Mineral	0	-0.37	-0.73	-1.08	-1.42	**-3.60**
Mingo	0	-2.70	-5.14	-7.34	-9.31	**-24.48**
Monongalia	0	-0.70	-1.39	-2.06	-2.71	**-6.85**
Nicholas	0	-34.75	-36.58	-38.41	-40.23	**-149.97**
Preston	0	-0.08	-0.15	-0.22	-0.29	**-0.74**
Raleigh	0	-0.59	-1.21	-1.86	-2.53	**-6.19**
Tucker	0	-0.05	-0.10	-0.15	-0.19	**-0.49**
Upshur	0	-0.05	-0.10	-0.15	-0.20	**-0.51**
Wayne	0	-0.24	-0.48	-0.71	-0.94	**-2.37**
Webster	0	-1.59	-3.15	-4.66	-6.15	**-15.55**
Wyoming	0	-2.23	-4.25	-6.09	-7.76	**-20.34**
State Remainder						
TOTAL	**0**	**-89.72**	**-123.25**	**-159.03**	**-187.31**	**-559.31**

Table C-4 State-Level Total Assessed Real and Personal Property (in millions)

Simulation	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Baseline	1,569.95	1,618.84	1,573.68	1,543.90	1,515.28	**7,821.64**
Phase-In	1,569.95	1,529.11	1,450.43	1,384.87	1,327.97	**7,262.33**
Policy-Induced Difference	0	-89.72	-123.25	-159.03	-187.31	**-559.31**

Table C-5 County-Level Baseline Changes in Assessed Real and Personal Property Taxes

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-422,159	-536,774	-65,154	-63,653	-62,153	**-1,149,894**
Boone	5,536,706	3,383,513	-1,853,006	-1,822,123	-1,791,797	**3,453,294**
Braxton	85,859	12,478	-25,926	-25,321	-24,716	**22,374**
Brooke	-91,898	292,582	-199,228	-194,710	-190,193	**-383,448**
Clay	-227,360	-334,724	-122,375	-119,559	-116,825	**-920,844**
Fayette	1,500,304	3,949,994	17,091	17,091	17,091	**5,501,572**
Grant	-658,410	324,560	-110,144	-107,522	-105,030	**-656,546**
Greenbrier	8,012	205,389	-47,471	-46,456	-45,440	**74,033**
Harrison	66,779	51,084	-62,445	-61,001	-59,598	**-65,180**
Kanawha	1,247,480	-86,942	95,633	95,845	96,163	**1,448,179**
Lincoln	3,324,075	827,638	-49,099	-47,969	-47,000	**4,007,645**
Logan	-6,258,024	-5,213,565	-3,657,596	-388,081	-377,482	**-15,894,748**
Marshall	-170,858	-334,151	-416,601	-406,983	-397,582	**-1,726,175**
McDowell	-1,976,928	-528,049	-328,662	-319,666	-310,931	**-3,464,236**
Mineral	-320,998	-50,561	-40,104	-38,831	-37,558	**-488,052**
Mingo	-578,104	356,659	-1,813,656	-1,726,490	-1,643,530	**-5,405,120**
Monongalia	403,684	129,770	-389,732	-380,808	-372,093	**-609,178**
Nicholas	7,071,139	1,665,882	-580,499	-554,409	-529,498	**7,072,615**
Preston	-266,266	-166,730	-72,713	-71,002	-69,357	**-646,068**
Raleigh	-4,240,566	-424,101	845,030	865,055	885,412	**-2,069,170**
Tucker	-9,312	-9,045	-3,304	-3,249	-3,195	**-28,105**
Upshur	129,030	-6,657	-49,853	-48,721	-47,589	**-23,790**
Wayne	-28,826	-131,564	-117,702	-114,986	-112,339	**-505,417**
Webster	268,795	133,943	-165,390	-161,624	-157,917	**-82,193**
Wyoming	-937,030	-381,854	-976,521	-932,538	-890,554	**-4,118,497**
State Remainder	0	0	0	0	0	**0**
TOTAL	**3,455,125**	**3,128,773**	**-10,189,427**	**-6,657,711**	**-6,393,711**	**-16,656,950**

Table C-6 County-Level Phase-In Changes in Assessed Real and Personal Property Taxes

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-422,159	-543,460	-71,704	-70,067	-68,429	**-1,175,819**
Boone	5,536,706	-1,182,956	-3,967,591	-3,864,708	-3,764,430	**-7,242,979**
Braxton	85,859	7,527	-30,763	-30,045	-29,365	**3,213**
Brooke	-91,898	254,483	-236,423	-231,002	-225,731	**-530,572**
Clay	-227,360	-594,772	-376,459	-367,788	-359,339	**-1,925,718**
Fayette	1,500,304	3,639,441	-294,916	-296,371	-297,826	**4,250,632**
Grant	-658,410	181,110	-250,316	-244,546	-238,908	**-1,211,070**
Greenbrier	8,012	195,742	-56,864	-55,595	-54,325	**36,969**
Harrison	66,779	46,253	-67,167	-65,615	-64,104	**-83,854**
Kanawha	1,247,480	-4,829,423	-1,482,370	-1,491,583	-1,500,691	**-8,056,587**
Lincoln	3,324,075	727,986	-146,491	-143,099	-139,869	**3,622,602**
Logan	-6,258,024	-6,008,198	-4,408,782	-1,849,629	-295,311	**-18,819,944**
Marshall	-170,858	-413,797	-494,410	-483,009	-471,878	**-2,033,952**
McDowell	-1,976,928	-736,640	-525,911	-505,964	-486,800	**-4,232,242**
Mineral	-320,998	-135,862	-123,496	-87,275	-18,739	**-686,370**
Mingo	-578,104	-269,174	-2,379,372	-2,236,294	-2,101,627	**-7,564,571**
Monongalia	403,684	-22,469	-538,454	-526,065	-513,991	**-1,197,294**
Nicholas	7,071,139	-5,204,830	-941,994	-915,905	-890,994	**-882,584**
Preston	-266,266	-176,930	-82,715	-80,807	-78,898	**-685,616**
Raleigh	-4,240,566	-576,193	685,822	698,399	711,143	**-2,721,396**
Tucker	-9,312	-16,035	-10,130	-9,912	-9,693	**-55,082**
Upshur	129,030	-16,103	-59,061	-57,720	-56,379	**-60,234**
Wayne	-28,826	-189,319	-174,134	-170,118	-166,193	**-728,590**
Webster	268,795	-89,029	-383,206	-374,401	-365,827	**-943,669**
Wyoming	-937,030	-936,423	-1,481,109	-1,390,588	-1,305,175	**-6,050,325**
State Remainder	0	0	0	0	0	**0**
TOTAL	**3,455,125**	**-16,889,073**	**-17,898,016**	**-14,849,703**	**-12,793,374**	**-58,975,056**

Table C-7 County-Level Policy-Induced Changes in Assessed Real and Personal Property Taxes

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	0	-6,686	-6,550	-6,413	-6,277	**-25,925**
Boone	0	-4,566,469	-2,114,585	-2,042,586	-1,972,633	**-10,696,273**
Braxton	0	-4,951	-4,837	-4,724	-4,648	**-19,161**
Brooke	0	-38,099	-37,195	-36,292	-35,539	**-147,125**
Clay	0	-260,047	-254,083	-248,230	-242,514	**-1,004,874**
Fayette	0	-310,553	-312,008	-313,462	-314,917	**-1,250,940**
Grant	0	-143,450	-140,172	-137,025	-133,878	**-554,523**
Greenbrier	0	-9,647	-9,393	-9,139	-8,885	**-37,063**
Harrison	0	-4,830	-4,722	-4,615	-4,507	**-18,674**
Kanawha	0	-4,742,481	-1,578,003	-1,587,428	-1,596,854	**-9,504,766**
Lincoln	0	-99,653	-97,391	-95,130	-92,869	**-385,043**
Logan	0	-794,632	-751,186	-1,461,548	82,171	**-2,925,195**
Marshall	0	-79,646	-77,809	-76,026	-74,297	**-307,777**
McDowell	0	-208,591	-197,249	-186,298	-175,868	**-768,007**
Mineral	0	-85,301	-83,392	-48,444	18,819	**-198,318**
Mingo	0	-625,834	-565,716	-509,804	-458,097	**-2,159,451**
Monongalia	0	-152,239	-148,722	-145,257	-141,897	**-588,115**
Nicholas	0	-6,870,712	-361,496	-361,496	-361,496	**-7,955,199**
Preston	0	-10,200	-10,002	-9,805	-9,541	**-39,548**
Raleigh	0	-152,092	-159,209	-166,656	-174,269	**-652,226**
Tucker	0	-6,990	-6,826	-6,662	-6,498	**-26,977**
Upshur	0	-9,446	-9,208	-8,999	-8,791	**-36,444**
Wayne	0	-57,756	-56,432	-55,131	-53,853	**-223,172**
Webster	0	-222,972	-217,817	-212,777	-207,911	**-861,476**
Wyoming	0	-554,569	-504,588	-458,050	-414,622	**-1,931,828**
State Remainder	0	0	0	0	0	**0**
TOTAL	**0**	**-20,017,846**	**-7,708,589**	**-8,191,993**	**-6,399,666**	**-42,318,104**

Table C-8 State-Level Total Changes in Assessed Real and Personal Property

Simulation	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Baseline	3,455,125	3,128,773	-10,189,427	-6,657,711	-6,393,711	**-16,656,950**
Phase-In	3,455,125	-16,889,073	-17,898,016	-14,849,703	-12,793,374	**-58,975,056**
Policy-Induced Difference	0	-20,017,846	-7,708,589	-8,191,993	-6,399,666	**-42,318,104**

Appendix D - Technical Report

This study extends an earlier evaluation of the economic impact of the Haden decision on coal production in southern West Virginia. In so doing this study extended the geographic region of interest and the range of economic questions to be addressed. This necessitated the use of several additional modeling tools as fiscal impacts were simulated and additional variables were forecast. This appendix outlines each of these areas in which the staff of CBER conducted original research.

Two areas of previous research were relied upon heavily in this analysis. The first was the earlier study of coal production, the second was the battery of research performed for the Governor's Commission on Fair Taxation. Those interested in detailed evaluation of the empirical methods should read both of these studies. This appendix only discusses the estimation of a coal production and migration structural models as well as forecasting models for employment security. The forecast model employed for the assessment of the Temporary Assistance to Needy Families program was derived from "A Dynamic Analysis of the West Virginia Cash Assistance Programs: 1978 - 1998" Lewis College of Business Working Paper 99-03-A by Michael J. Hicks.

Coal Production Model

This study attempts to simulate the short run impact of a variety of economic changes on coal production in all major coal producing counties in West Virginia. A centerpiece of this effort was the construction of an econometric model of coal supply and demand that would capture key variables that influence the sale and mining of bituminous coal. This effort provides a basis for formulating simulations of the impact of changes in these key variables on coal production in individual counties in southern West Virginia. These include changes in cost, price, imports, exports and other factors affecting the mining and sale of West Virginia coal. By linking this model to individual counties we are able to simulate changes in coal production, wages and employment by adjusting these external variables. Changes in the external economic factors of supply and demand are provided by projecting trends externally and applying them to the model. The final step in this process is to estimate the county level impact on overall jobs, income and output as changes in coal production, employment and wages occur. This appendix outlines the modeling process for coal supply and demand presenting both the theoretical and econometric issues involved in its construction.

A key limitation in this effort was the dearth of monthly or quarterly time series data for several important variables. Similarly, data error, lumpiness and outright absence of critical data components suggest a variety of estimation and modeling techniques be employed to overcome these challenges. Two guiding principles aided in this process. The first was to employ conservative, defensible assumptions. The second was to adhere to existing, obvious institutional conditions where possible. These principles allowed us to impose restrictions on parameter estimates which realistically reflected effects that we observe, but cannot empirically model. When we apply restrictions generated by these assumptions we explicitly describe these restrictions in the

text.[30] Since we are adopting this technique, we also performed a fragility analysis of the critical coefficients in the model.

The Data

The selection of annual variables was necessitated by the data, see Table D-1.

Table D-1, Supply and Demand Variables

Variable	Description
WVCOALQ	county level coal production in tons
BTUEST	the BTU estimate, in SO_2 per ton of West Virginia coal, all pre-1986 values held constant, a proxy for quality
ELECD	Per capita electricity use in the United States in Kwh, a proxy for end use demand
BTUprice	The price per BTU of coal
Import	U.S. imports of coal in tons
Export	U.S. exports of coal in tons
Bondrate	The real rate on 6-month Commercial Bonds, a proxy for per capita capital costs
Minewage	The real annual wage of coal miners in West Virginia, a proxy for per unit labor costs
Tech	The residual from the basic underground production function, a proxy for technology shocks.
Umine	The number of underground mines, per county
Smine	The number of surface mines, per county
AR(n)	The n lagged autoregressive component

These data are available from a variety of sources noted in the reference section of this report.

Model Specification

We specified the following supply and demand model:

[30]This techniques is commonly termed Bayesian estimation. The primary elements of Bayesian Estimations we employed involve the non-positive restriction on the price coefficient to adhere to institutional details which we have discussed in the text of this study. This turned out to be moot since this was among the consistent statistical results.

$$Q_D = f(BTU, BTUprice, ELECD, IMPORT, EXPORT)$$

$$Q_S = f(BTUprice, Tech, Bondrate, Minewage, Umine, Smine)$$

$$Q_S^* = Q_D^*$$

In this specification we assume that the quantities Q_D and Q_S are total industry output, which is further defined as:

$$Q^* = \sum_{i=1}^{n} q_i$$

where total output in the industry is the sum of individual producer output. We assume that firms in West Virginia face a competitive market in which they are price takers.[31] This assumption of competitive markets permits us to estimate a partial equilibrium model. In this case total demand Q_D is a function of q_i in West Virginia. This suggests we introduce West Virginia coal production as an explanatory variable in our demand and supply equations above:

$$Q_D = f(BTU, BTUprice, ELECD, IMPORT, EXPORT, WVCOALQ_d)$$

$$Q_S = f(BTUprice, Tech, Bondrate, Minewage, Umine, Smine, WVCOALQ_s)$$

$$Q_S^* = Q_D^*$$

This simple specification, in general form, is consistent with most modeling approaches for energy supply and demand in a partial equilibrium setting (see Varian, 1992, Silberburg, 1994). Since our efforts involve simulation of regional impacts to a variety of shocks, we are not interested in estimating demand and supply coefficients individually. We are instead searching for the reduced form of the equation which would yield a sensitivity coefficient of changes in external variables on the equilibrium quantity of coal. The parameter estimates provide some insight to the net impact of variables through their magnitude and direction. The specification will be in the first differences of the natural logarithm, so omitting that notation the model takes the form:

[31]The shift from long term production contracts to a futures based commodification offers some credible anecdotal evidence of this assumption. Similarly the rapid technological diffusion, homogeneity of product and large numbers of buyers and sellers suggests a high degree of at least *effective competition* in this market.

$$Q_D = a_1^i + g_d WVCOALQ_D + a_2 BTU + a_3 ELECD + a_3 BTUprice + a_5 IMPORTS + a_6 EXPORTS$$

$$Q_S = b_1^i + g_s WVCOALQ_D + b_4 BTUprice + b_7 Tech + b_8 Bondrate + b_9 Minewage + b_{10} Umine + b_{11} Smine$$

Given the equality of supply and demand in equilibrium and our desire to estimate marginal effects on the exchanged quantity of coal, not demand and supply coefficients, a reduced form equation would seem useful. For our purposes a reduced form equation yields coefficients on each variable that allow us to estimate (in log-log form) the percentage change in West Virginia coal attributable to a one percent change in each explanatory variable. To this we added an autoregressive component, $\ddot{o}_{t-n} WVCOALQ_{t-n}$. The reduced form equation takes the form:

$$WVCOALQ^* = \frac{a_1^i + b_1^i}{g_S + g_D} + \frac{a_2}{g_S + g_D}(BTU) + \frac{a_3}{g_S + g_D}(ELECD) + \frac{a_4 + b_4}{g_S + g_D}(BTUprice) + \frac{a_5}{g_S + g_D}(IMPORTS) + \frac{a_6}{g_S + g_D}(EXPORTS) + \frac{b_7}{g_S + g_D}(Tech) + \frac{b_8}{g_S + g_D}(Bondrate) + \frac{b_9}{g_S + g_D}(Minewage) + \frac{b_{10}}{g_S + g_D}(Umine) + \frac{b_{11}}{g_S + g_D}(Smine) + \frac{f_{t-n}}{g_S + g_D}(WVCOALQ_{t-n}) + \frac{u_{i_t} + e_t}{g_S + g_D}$$

The final term represents the composite error term for the model which is adjusted by the sums of the coefficient estimates of the regional supply and demand variables. We rewrite the expression, compressing the rather tedious coefficient notation into the following:

$$WVCOALQ^* = B_1^i + B_2(BTU) + B_3(ELECD) + B_4(BTUprice) + B_5(IMPORTS) + B_6(EXPORTS) + B_7(Tech) + B_8(Bondrate) + B_9(Minewage) + B_{10}(Umine) + B_{11}(Smine) + B_{12}(COALQ_{t-n}) + e_j$$

From this form we can estimate our fixed effects model preserving the obvious cross sectional specific variation of county level coal output and number of mines.[32] The fixed effects model combines variation across counties (the cross sectional component) with intertemporal variation (the time series component) in a series of intercept terms (B^i_1) that vary for each county. This method is recommended for a variety of technical reasons.[33] The remaining variables are estimated in aggregate (no county level variation). The result, in first differenced, log-log form gives us parameter estimates B_2, B_3, . . .B_{11} which are directly interpreted as the percentage change in annual output for West Virginia mines. The B_1 coefficients are the fixed effect adjustments, or county specific intercepts and the B_{12} coefficients are the matrix of autoregressive parameters (3 lagged components).

Unfortunately, this type of reduced form specification does not permit clear theoretical expectations regarding either the magnitude or sign of the parameter estimates. This is due to the fact that individual coefficient estimates capture combined supply and demand effects. We can impose restrictions on some of the coefficients to reflect current conditions -- a Bayesian approach. This proved of little benefit.

Econometric Methods

Early in the data collection process it became apparent that *ordinary least squares* estimates would be inappropriate for a variety of reasons. Chief among these was the absence of a long time series and the use of proxy variables for quality and capital structures. A substitute for *ordinary least squares* is a *weighted least squares* estimator that minimizes a weighted horizontal and vertical deviation from the estimated linear function. The *weighted least squares* estimator appears as:

$$B_{wls} = \left(X \odot V^{-1} X\right)^{-1} X \odot V^{-1} y \qquad \text{"} V^{-1} = [\cdot .] \left(1/s_{11}, \ldots, 1/s_{nm}\right) \ddot{A} I_t$$

$$\text{wher e var}\left(B_{wls}\right) = \left(X \odot V^{-1} X\right)^{-1}$$

The *weighted least squares* estimator is efficient and consistent, but not asymptotically unbiased in a single equation model with autocorrelated or heteroscedastic errors (see Kmenta, 1986; Kennedy, 1996). This presents additional problems which we discuss later.

The use of a panel series with a number of cross sectional invariant parameters was immediately considered and subsequently adopted. For example, while we could

[32]The use of county level variables recommends itself, econometrically, as a method of preserving degrees of freedom. However, from an analytical standpoint strong cross county heterogeneity in the mix of surface and underground production suggests that some disaggregation is necessary.

[33]The data exhausts the population (this is not a sample estimate) and there is strong evidence to suggest cross-sectional correlation. Both of these conditions recommend the use of the fixed effects model.

determine the county level production, we could not determine county level (or state level) exports, and so used a national variable as proxy. This variable was not permitted to vary across counties in this model. The panel technique selected was the fixed effects model.[34] Similarly, following a visual inspection of the data a first differenced, or de-trended estimation technique appeared appropriate. This was confirmed through an exhaustive set of unit-root tests.[35] Similarly, a log-log specification was initially employed for its ease of interpretation (see Varian, 1992; Greene, 1994; Kennedy, 1996).

Deviations from the classical linear model also included the potential for autocorrelated errors, heteroscedastic errors and multi-collinearity. The latter fortunately was not clearly effecting any of the final model specifications.[36] The inclusion of autoregressive components in the estimation cleared the autcorrelation problem. This also eliminated inconsistent errors in the weighted least squares estimator. Confirmation of the absence of autocorrelated errors was performed through a *Hausman* test, taking the specification:

$$Y_H = BX + au + e$$

where the original specification $Y = BX + u$ is re-estimated with the inclusion of the original residual u and a subsequent residual e. The hypothesis tested is $á \neq 0$, of which a failure to reject implies autocorrelated errors, see Hausman (1978). The selection of optimal lag length for the autoregressive component simply involved optimizing goodness of fit measures.[37] Ensuing Durbin-Watson statistics confirming this process as correct.

A similarly easy step was the use of White's heteroscedasticity invariant standard errors in estimation:

$$x_W = \frac{T}{T - K}(X©X)^{-1}\left[\sum_{t=1}^{T} u_t^2 x_t x_t©\right](X©X)^{-1}$$

[34]The Fixed effect model is appropriate when exhausting the study population, as we have done. Other reasons including autoregressive componeents recommend this choice, with no reasonable substitutes emerging.

[35]The augmented Dickey-Fuller tests clearly rejected the hypothesis of a unit root meaning that these variables possessed a time trend, or were non-stationary. The hypothesis of a unit root in first differences for each variable could not be rejected at high levels of significance, typically .01 percent. Since this process involved well over a hundred variables we have not included these texts in the report. The authors will provide these results upon request.

[36]Use of pricing variables specific to underground or above ground coal proved to be a nearly linear combination providing textbook test statistics. This was expected, and the weighted BTU price employed in subsequent estimations prove much more fruitful.

[37]Both the Akaike Information Criterion and Adjusted R^2confirmed three lags as optimal for the autoregressive component.

This matrix, $\mathbf{X_W}$, is employed to calculate the standard errors. This removes the inefficiencies noted in the *weighted least squares* estimator under conditions of heteroscedastically distributed errors, see White (1980). This cleared the final hurdle. All of these empirical procedures were programmed as an *a priori* step in estimation. Estimation results for the full model are similar to those in the 9 county model, and are not illustrated here.

Economies of Scope in Coal Production

This model provides an integral production simulation tool for the model of Coal Supply and Demand offered above. This model evaluates the *economies of scale* within underground coal mining and the *economies of scope* across surface and underground mining in nine southern West Virginia counties. The results of this model provide simulation of production changes in underground mining resulting from regulatory impact on surface mining.

This effort permits an overall output simulations of a variety of regulatory impacts that potentially impact surface coal production. This was primarily the *economies of scope* contribution to the study which measured the impact of a decline in surface production on underground production. This is theoretically justified from a variety of models which identify the existence of non-separable cost functions. The formalization of this theory is attributed to Baumol, Panzar, and Willig [1983]. A simplification of their approach involves the production of two goods, x and y; the production costs of which may be described by the function $C(x,y)$. The existence of the economies of scope is confirmed by the relationship:

$$C(x,y) < C(x,0) + C(0,y)$$

where the cost of producing the two goods together is less than a separation of the production process. Testing this hypothesis and generating simulation results are a primary goal of this research.

The Model

In order to test this relationship we model not the cost function, but the production function. This function relates the combination of inputs to the combination of outputs in a regional setting. This is especially useful for our purposes since we are focusing on county level, not firm level outputs. The absence of firm or regional specific production costs and capital costs also recommends the use of the production function approach. The use of a production function in lieu of a cost function follows from an extensive duality result.[38] Assume a cost function that is differentiable, concave, monotonic, and homogeneous of degree one. Establishing two inputs, capital (K) and labor (L), respective factor prices, w_1 and w_2, output x and technological adjustment parameter a we have:

[38] For an expanded discussion see Varian, [1992, pg. 82-93. And Silberburg [1990] pg. 281-284.

$C(w,x) = x w_1^a w_2^{1-a}$ then individual input demands (capital and labor) are derived from:

$K(w_1,x) = a x w_1^{a-1} w_2^{1-a} = a x \left(\frac{w_2}{w_1}\right)^{1-a}$

$L(w_2,x) = (1-a) x w_1^a w_2^{-a} = (1-a) x \left(\frac{w_2}{w_1}\right)^{-a}$ which results in:

$\left(\frac{K}{a x}\right)^{\frac{1}{1-a}} = \frac{w_2}{w_1} = \left(\frac{L}{(1-a)x}\right)^{\frac{-1}{a}}$ and:

$\frac{K^{-a}}{a^{-a} x^{-a}} = \frac{L^{1-a}}{(1-a) x^{1-a}}$ which can be rewritten

$[a^a (1-a)^{1-a}] x = K^a L^{1-a}$ which is the well known Cobb-Douglas Production Function

The production function method is straightforward and test (among other items) simply if underground production is affected by the presence of surface mining in the same county. The model in general form takes the form:

$$Q_u = f(K_i, L_i, Q_s)$$

where Q_u is underground production, K is productive capital and machinery, L_i is county level employment in underground mining and Q_s is county level output in surface mining. The specification of this model is theoretically straightforward. However a number of data restrictions complicate the process.

The Data

The short time period of available data recommends a cross sectional time series estimation technique to preserve degrees of freedom. This was complicated by the absence of county specific capital proxies. The product of the total capital and capital utilization rates in the underground bituminous coal mining industry was generated to serve as an aggregate proxy for capital. This measure was employed by Naples [1998] for a coal industry production function. Underground and surface quantities and underground mining employment data were available at the county level. The prime modeling drawback to this technique is that it limits that interpretation of the technology parameters in the Cobb-Douglas Production function. The usual interpretation of the technology parameters (the *a* component) is that the sum of these component reflect the economies of scale. Since we will perform both disaggregated and aggregated analysis this interpretation is problematic. Control variables listed below were also employed in the specification of this production function. See Table D-2.

Table D-2, Production Function Variables

Variable	Description
Qu, Qs	county level coal production in tons (underground and surface)
Uemp	county level underground mining employment
Capuse	The product of the national capacity utilization rate and available capacity in the underground mining sector

These data are available at a number of sources cited in the reference portion of the report. Econometric methods are almost identical to those outlined in the production model, and results are available in the original report.

Migration

Human migration in response to economic stimulus has long been evaluated with economic and statistical methods. Our interest here is to extend that research into an evaluation of a simple population dynamic, not merely migratory response to economic activity. So, our model abstracts from the components of population, aggregating total population into a cross sectional time series model of county specific population through a forecast period.

This model is similar in econometric construct to the coal production model outlined above and has been corrected for the same econometric problems outlined above. The chief difference between the models is, of course, the specification.

The population model evaluates a number of economic variables including personal income, the proportion of transfer payments and underground and surface production. Initially, the use of mean age and education achievement variables was tested. This was done in order to concentrate on the major regional differences inherent in the population of West Virginia. Not surprisingly, these variables were highly collinear with those of the transfer payments and average per capita income. This well known problem in this type of model necessitated the exclusion of one or more of the variables that comprised the linear combinations. The elimination criterion was based upon the best fitting model approach articulated by Bozdogan (1998) in which the minimization of the Akaike Information Criterion was used. The result was that personal income and the proportion of personal income provided by government transfer payments provided more explanatory power for population changes than did the non-economic variables of age and educational achievement. The estimation results appear in Table D-3.

Table D-3, Results of Migration Model

Variable	Coefficient	Standard Error	t-Statistic	Probability
D((?TP(-1)/(?PI(-1)-?TP(-1))))	3460.680	876.0551	3.950299	0.0001
D(?MA)	-4.28E+15	4.81E+15	-0.891334	0.3730
D(?SY(-1))	-3.70E-06	5.10E-06	-0.725565	0.4683
D(?UY(-1))	1.75E-05	1.64E-05	1.061783	0.2887
D((?PI(-1)-?TP(-1)))	0.010566	0.002639	4.004519	0.0001
Change in Unemployment Rate				
BARB	13.92646	10.18175	1.367788	0.1718
BERK	182.3388	57.81242	3.153972	0.0017
BOON	-0.222590	15.20148	-0.014643	0.9883
BRAX	16.29980	8.859503	1.839810	0.0662
BROO	-12.79600	19.38643	-0.660049	0.5094
CABE	135.4854	83.16841	1.629049	0.1037
CALH	-7.295211	6.509648	-1.120677	0.2628
CLAY	0.086051	9.440955	0.009115	0.9927
DODD	3.689615	12.17718	0.302994	0.7620
FAYE	84.78391	27.67149	3.063944	0.0023
GILM	30.12685	10.26823	2.933987	0.0034
GRAN	-12.27217	7.651093	-1.603977	0.1091
GREE	26.96518	40.43835	0.666822	0.5051
HAMP	25.87004	18.57146	1.392999	0.1640
HANC	68.01895	34.02596	1.999031	0.0460
HARD	6.334236	10.88283	0.582039	0.5607
HARR	20.27492	93.47279	0.216907	0.8283
JACK	4.477647	11.67659	0.383472	0.7015
JEFF	3.648936	17.25080	0.211523	0.8325
KANA	390.4660	282.1074	1.384104	0.1667
LEWI	13.42428	29.07959	0.461639	0.6445
LINC	-36.83854	37.58976	-0.980015	0.3274
LOGA	53.54634	26.48264	2.021941	0.0435
MARI	62.81798	61.54540	1.020677	0.3077
MARS	43.81232	20.48758	2.138482	0.0328
MASO	-3.352851	14.51324	-0.231020	0.8174
MCDO	41.51294	37.98308	1.092932	0.2748
MERC	69.78930	61.73280	1.130506	0.2586
MINE	-1.414563	29.73606	-0.047571	0.9621
MING	78.50741	14.32423	5.480742	0.0000
MONO	61.02692	98.21172	0.621381	0.5345
MONR	-7.310556	21.67807	-0.337233	0.7360
MORG	20.31200	15.11535	1.343800	0.1794
NICH	-22.23226	5.630188	-3.948760	0.0001
OHIO	95.56175	88.37296	1.081346	0.2799
PEND	7.277481	33.65692	0.216225	0.8289
PLEA	1.921412	5.605978	0.342743	0.7319
POCA	17.60464	12.16441	1.447226	0.1482
PRES	-0.327378	21.42764	-0.015278	0.9878
PUTN	1.558881	61.82330	0.025215	0.9799
RALE	95.12989	79.37031	1.198558	0.2311
RAND	66.70000	40.48724	1.647433	0.0999
RITC	1.540441	13.71705	0.112301	0.9106
ROAN	6.219282	14.79131	0.420469	0.6743
SUMM	17.47592	14.56212	1.200094	0.2305
TAYL	18.49819	11.45458	1.614917	0.1067
TUCK	21.42152	19.60170	1.092840	0.2748
TYLE	-7.189981	13.95608	-0.515186	0.6066
UPSH	17.13055	23.88768	0.717129	0.4735
WAYN	101.8411	35.26616	2.887786	0.0040
WEBS	16.17416	11.48421	1.408382	0.1594
WETZ	30.29649	9.386951	3.227512	0.0013
WIRT	2.934226	1.647560	1.780952	0.0753
WOOD	103.9248	76.40156	1.360245	0.1742
WYOM	14.86358	9.734569	1.526886	0.1272

Table D-3 Continued

Fixed Effects Intercepts			
BARB_--C	2.06E+15		
BERK_--C	1.07E+15		
BOON_--C	2.74E+15		
BRAX_--C	1.76E+15		
BROO_--C	2.74E+15		
CABE_--C	1.59E+15		
CALH_--C	7.28E+14		
CLAY_--C	3.17E+15		
DODD_--C	2.27E+15		
FAYE_--C	1.41E+15		
GILM_--C	3.13E+15		
GRAN_--C	2.78E+15		
GREE_--C	1.07E+15		
HAMP_--C	1.59E+15		
HANC_--C	2.70E+15		
HARD_--C	1.59E+15		
HARR_--C	1.76E+15		
JACK_--C	2.18E+15		
JEFF_--C	1.54E+15		
KANA_--C	2.01E+15		
LEWI_--C	1.37E+15		
LINC_--C	2.23E+15		
LOGA_--C	2.66E+15		
MARI_--C	2.10E+15		
MARS_--C	2.44E+15		
MASO_--C	2.18E+15		
MCDO_--C	2.96E+15		
MERC_--C	2.40E+15		
MINE_--C	1.88E+15		
MING_--C	2.06E+15		
MONO_--C	1.37E+15		
MONR_--C	2.14E+15		
MORG_--C	2.36E+15		
NICH_--C	2.48E+15		
OHIO_--C	2.01E+15		
PEND_--C	1.88E+15		
PLEA_--C	2.53E+15		
POCA_--C	2.18E+15		
PRES_--C	2.01E+15		
PUTN_--C	1.80E+15		
RALE_--C	2.57E+15		
RAND_--C	2.23E+15		
RITC_--C	1.71E+15		
ROAN_--C	1.71E+15		
SUMM_--C	2.57E+15		
TAYL_--C	1.84E+15		
TUCK_--C	2.14E+15		
TYLE_--C	2.31E+15		
UPSH_--C	2.18E+15		
WAYN_--C	2.23E+15		
WEBS_--C	2.36E+15		
WETZ_--C	2.40E+15		
WIRT_--C	1.63E+15		
WOOD_--C	2.06E+15		
WYOM_--C	3.04E+15		
R-squared	0.651582	Mean dependent var	-156.9608
Adjusted R-squared	0.598834	S.D. dependent var	593.8485
F-statistic	23.86777	Durbin-Watson stat	1.137273
Prob(F-statistic)	0.000000		

These results explain a large proportion of population change (including natural population change unrelated to economic migration). We feel that this model is appropriate for the population and migration questions that are critical to this report; however, there are other issues regarding actual out and in-migration, births and deaths and perhaps most critically the composition of any new migration. This model evaluated all the counties in the state, regardless of their coal production. The results suggest little or no net population change during the forecast period, and so we have not added migratory effects into the demand for public services. This maintains a prudently conservative picture of the potential fiscal impacts. We do feel that in addition to this rather generalized migration model, that an evaluation of several gravity models of migration would be useful in determining the inter state impact of migration. Extremely disaggregated gravity models would allow local planners and policy makers to evaluate the potential for migration to urban centers where changes in the cost of key services would be impacted.

The Unemployment Security Model

Estimation of employment security trust funds is challenged by the potential nonlinearity of the variables. In order to avoid this extremely complicated application we forecast the balance in the Unemployment Security Fund against unemployment rates, lags and and autoregressive and moving average components. This variable was stationary (using the augmented Dickey-Fuller test). Corrections for heteroscedasticity were employed, as in the coal production model. The US model performed well, with an adjusted goodness of fit measure greater than .96, with stationary variables. The coefficient estimate for the unemployment rate was roughly 9.7 million dollars. See the main body for the interpretation of this result.

Table D-4, Unemployment Security Fund Balance

Variable	Coefficient	Standard Error	t-Statistic	Probability
C	83881876	38403029	2.184252	0.0716
WVUNEMP	-9746836.	4206962.	-2.316835	0.0597
BALANCE(-1)	-0.377210	0.090300	-4.177315	0.0058
BALANCE(-2)	-0.506220	0.079818	-6.342181	0.0007
AR(1)	0.203623	0.185924	1.095197	0.3154
AR(2)	1.015485	0.375480	2.704496	0.0354
AR(3)	-0.034171	0.329806	-0.103610	0.9209
AR(4)	-0.723337	0.126731	-5.707644	0.0013
MA(1)	-0.762203	1.395003	-0.546381	0.6045
MA(2)	-0.705642	0.315576	-2.236043	0.0667
MA(3)	0.102408	0.660157	0.155127	0.8818
MA(4)	0.526892	0.408911	1.288525	0.2450
R-squared	0.986478	Adjusted R-squared		0.961688
Log likelihood	-301.6948	F-statistic		39.79294
Durbin-Watson stat	2.438387	Prob(F-statistic)		0.000106
	1st Lag	2nd Lag	3rd Lag	4th Lag
Inverted AR Roots	.88 -.38i	.88+.38i	-.78 -.43i	-.78+.43i
Inverted MA Roots	.96+.24i	.96 -.24i	-.58+.45i	-.58 -.45i

Comparison of IMPLAN and REMI Results

The use of two competing commercial economic models is a valuable adjunct in this analysis. The *Center for Business and Economic Research* maintains the Implan and REMI model which are used for a variety of applications.

The IMPLAN model is a static, input-output model of an economy which is ideal for evaluating short term impacts. It is very similar to a non-commercial model the Regional Impact Modelling System produced by the Bureau of Economic Analysis. An especially attractive feature of the IMPLAN model is its ability to evaluate in great detail potential impacts as it allows disaggregation to over 500 sectors of the economy. Its drawback is that over time any economy will adjust to changing conditions so that the underlying production and market interactions within a county may modify. This would generate, over a five year period, modest errors. However over longer periods the errors could magnify considerably.

The REMI model is a hyrid regional activity model which incorporates some of the input-output characteristics of the IMPLAN model with computable general equilibrium characteristics along with a robust econometric estimation procedure. The econometric estimation procedure provides specific regional variation in the rate of change and magnitude of economic relationships based upon regional variation. This is especially useful for long range evaluation of impacts. The REMI model currently maintained by the CBER does not possess the disaggregation capability of the IMPLAN model, having 44 major industrial sectors.

Both models are widely employed as economic simulations tool. Both are widely respected, but the dynamic components of the REMI model make it a much more complex model. Indeed, REMI is the most respected modelling effort to date for regional economic simulation. There are no significant competitors.

The comparison of these models is useful for several reasons. Any divergence, which cannot be explained reduces the confidence in the model. Also, redundant results based on different methods offer at least some increased suspicion that they are correct. The text outlined the extraordinary proximity between the REMI and this study's coal production forecast. That closeness is especially heartening to us both due to the stature of the REMI model and due to the disaggregated forecast method we employed. The migration models differed slightly with REMI forecasting roughly 1700 economic migrants and our model yielding a net population decline of roughly 300 through the forecast period.

The impacts on employment, wages and production were all extraordinarily similar in both the REMI and IMPLAN models. Indeed, the variations between the two models were never more than 5 percent for each of the forecast years.

Appendix E - School Funding

West Virginia provides a *Public School Support Program* which allocates funding to individual counties based upon a formula outlined in WVC§§18-9A-2 through WVC§§18-9A-25. Definitions for many of these programs, and ancillary funding are outlined in WVC§§18-20-1. These sections of the West Virginia Code outline the formulaic procedures for calculating school funding for individual counties. The process of school financing is designed to provide educational dollars that are linked to the actual cost of providing educational services. The actual cost differences accounted for in the formula are targeted at a model school system, so that variation that is not directly linked to travel costs, student population, and other variables outside the short run decision making of each school district are accounted for. The formula does not address regional variation based upon chosen pay differentials or other policy decision variables.

The formula, while imperfect, provides a close approximation of actual costs across each school district and provides the necessary balance so that most of West Virginia's school children do not suffer from educational differences due primarily to State financing. A major shortfall in the funding formula is that it may not capture true costs that are outside the control of school boards. For example, a dramatic loss of student population, due to outmigration may mean that the average teacher has more seniority, and hence is better paid than in other counties. This differential is not accounted for in the formula. Also, rapid changes in population are not readily addressed since there are restrictions in rates of change of some variables in the formula.

The following page contains a mathematical language version of the West Virginia Codes regarding the basic school funding formula. The following abbreviations have been used:

Abbreviation	**Description**
ASMS	Annual state minimum salary for professional educators
SSN	Social Security contributions by employers
ADJ Enroll	**Adjusted enrollment**
Net Enroll	Net enrollment
PE emp	Actual number of professional educators employed
ASMSSP	Annual state minimum salary for support personnel
Actual EXP	Actual expenditures
BFIC	Bus Fleet Insurance Costs
BFRC	Bus Fleet Replacement Costs
AILT	Alternative payments in lieu of transportation

$$\textbf{County Funding} = \left[\text{ASMS} + (\text{SSN} + \text{WC})\right] \bullet \min\left\{\begin{bmatrix}\frac{53.5}{1{,}000} \bullet (\text{adj enroll}) \\ \frac{74}{1{,}000} \bullet (\text{net enroll}) \\ (\text{actual PE emp})\end{bmatrix}\right\} + \left[\text{ASMSSP} + (\text{SSN} + \text{WC})\right] \bullet \min\left\{\begin{bmatrix}\frac{34}{1{,}000} \bullet (\text{adj enroll}) \\ \left[\begin{matrix}\frac{43.6}{1{,}000} \bullet (\text{net enroll}) \forall \frac{\text{SP}_i}{\sum \text{SP}_i} > \overline{\text{X}} \\ \frac{43.6}{1{,}000} \bullet (\text{net enroll}) \forall \frac{\text{SP}_i}{\sum \text{SP}_i} < \overline{\text{X}}\end{matrix}\right] \\ (\text{actual PE emp})\end{bmatrix}\right\}$$

$$+ \begin{bmatrix}0.85 \bullet \text{Actual Exp} \forall \frac{\text{Students}}{\text{Miles}^2} < \overline{\text{X}} \\ 0.90 \bullet \text{Actual Exp} \forall \frac{\text{Students}}{\text{Miles}^2} > \overline{\text{X}}\end{bmatrix} + \left[\text{BFIC} + 0.0833 \bullet (\text{BFRC}) + \text{AILT}\right] \Big| (1.33 \bullet \overline{\text{X}}) + \$150 \bullet \min\left\{\begin{bmatrix}\frac{53.5}{1{,}000} \bullet (\text{adj enroll}) \\ \frac{74}{1{,}000} \bullet (\text{net enroll}) \\ (\text{actual PE emp})\end{bmatrix}\right\}$$

$$+ 0.10 \bullet \left(\frac{n_i}{\sum n_i}\right) \bullet \left(\begin{matrix}\left[\text{ASMS} + (\text{SSN} + \text{WC})\right] \bullet \min\left\{\begin{bmatrix}\frac{53.5}{1{,}000} \bullet (\text{adj enroll}) \\ \frac{74}{1{,}000} \bullet (\text{net enroll}) \\ (\text{actual PE employ})\end{bmatrix}\right\} \\ + \left[\text{ASMSSP} + (\text{SSN} + \text{WC})\right] \bullet \min\left\{\begin{bmatrix}\frac{34}{1{,}000} \bullet (\text{adjust enroll}) \\ \left[\begin{matrix}\frac{43.6}{1{,}000} \bullet (\text{net enroll}) \forall \frac{\text{SP}_i}{\sum \text{SP}_i} > \overline{\text{X}} \\ \frac{43.6}{1{,}000} \bullet (\text{net enroll}) \forall \frac{\text{SP}_i}{\sum \text{SP}_i} < \overline{\text{X}}\end{matrix}\right] \\ (\text{actual PE emp})\end{bmatrix}\right\}\end{matrix}\right)$$

$$+ 0.025 \bullet \left[\left(\frac{n_i}{\sum n_i}\right) \bullet \left(\begin{matrix}\left[\text{ASMS} + (\text{SSN} + \text{WC})\right] \bullet \min\left\{\begin{bmatrix}\frac{53.5}{1{,}000} \bullet (\text{adj enroll}) \\ \frac{74}{1{,}000} \bullet (\text{net enroll}) \\ (\text{actual PE emp})\end{bmatrix}\right\} \\ + \left[\text{ASMS} + (\text{SSN} + \text{WC})\right] \bullet \min\left\{\begin{bmatrix}\frac{34}{1{,}000} \bullet (\text{adj enroll}) \\ \left[\begin{matrix}\frac{43.6}{1{,}000} \bullet (\text{net enroll}) \forall \frac{\text{SP}_i}{\sum \text{SP}_i} > \overline{\text{X}} \\ \frac{43.6}{1{,}000} \bullet (\text{net enroll}) \forall \frac{\text{SP}_i}{\sum \text{SP}_i} < \overline{\text{X}}\end{matrix}\right] \\ (\text{actual PE emp})\end{bmatrix}\right\}\end{matrix}\right)\right] + \$200 \bullet \left(\text{Faculty Senate Members}\right) \Big| v < 104.0 \bullet v_{t-1}$$

Haden Decision Impacts

As outlined in the main text, the shortfall in State funding to schools is, in our judgment, an obligation that the State will have to meet from other revenue sources. The shortfall from property taxes in this area is just over $21 million through the end of the forecast period. However, counties also fund education through excess levies drawn primarily upon property taxes. These shortfalls will have a significant impact upon the counties losing funds.

Table E-1 outlines the shortfalls in excess levy revenues dedicated to education. These include all related education levies including those for construction of school facilities. It does not count newly passed levies that have not yet been implemented, nor does it account for potential shortfalls outside coal producing areas. Though some decline in property taxes is possible, we do not predict the impact to be significant outside coal producing counties.

Table E-1 County-Level Phase-In School Funding Shortfalls

County	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Years 1-5 Total*
Barbour	-120,850	-155,575	-20,526	-20,058	-19,589	**-336,599**
Boone	1,988,535	-424,864	-1,424,980	-1,388,029	-1,352,014	**-2,601,352**
Braxton	45,111	3,955	-16,163	-15,786	-15,429	**1,688**
Brooke	-36,091	99,942	-92,850	-90,721	-88,651	**-208,370**
Clay	-37,686	-98,586	-62,399	-60,962	-59,562	**-319,195**
Fayette	593,860	1,440,586	-116,736	-117,311	-117,887	**1,682,511**
Grant	-47,764	13,139	-18,159	-17,740	-17,331	**-87,856**
Greenbrier	2,483	60,665	-17,624	-17,230	-16,837	**11,458**
Harrison	25,311	17,531	-25,457	-24,869	-24,297	**-31,782**
Kanawha	442,006	-1,711,157	-525,232	-528,497	-531,724	**-2,854,603**
Lincoln	1,202,849	263,429	-53,009	-51,782	-50,613	**1,310,874**
Logan	-2,440,215	-2,342,799	-1,719,133	-721,233	-115,152	**-7,338,533**
Marshall	-67,402	-163,240	-195,041	-190,543	-186,152	**-802,378**
McDowell	-782,520	-291,581	-208,169	-200,274	-192,688	**-1,675,232**
Mineral	-127,059	-53,778	-48,883	-35,206	-7,560	**-272,486**
Mingo	-243,785	-113,510	-1,003,374	-943,039	-886,250	**-3,189,958**
Monongalia	170,266	-9,477	-227,109	-221,884	-216,791	**-504,994**
Nicholas	2,094,304	-1,541,548	-278,996	-271,269	-263,891	**-261,400**
Preston	0	0	0	0	0	**0**
Raleigh	-1,932,860	-262,630	312,599	318,332	324,141	**-1,240,419**
Tucker	0	0	0	0	0	**0**
Upshur	28,274	-3,529	-12,942	-12,648	-12,354	**-13,199**
Wayne	-11,093	-72,852	-67,008	-65,463	-63,952	**-280,368**
Webster	0	0	0	0	0	**0**
Wyoming	-432,232	-431,952	-683,204	-641,449	-602,050	**-2,790,887**
TOTAL	**313,442**	**-5,777,832**	**-6,504,397**	**-5,317,661**	**-4,516,633**	**-21,803,081**

*These numbers represent estimated changes to county school excess levies. Also included are school improvement levies (Mingo and Wyoming) and school bonds (Barbour, Brooke, Greenbrier, Harrison, Kanawha, Monongalia, Nicholas, Raleigh and Wyoming).