THE PROJECTED ECONOMIC AND FISCAL IMPACT OF THE BIG RIVER STEEL PROJECT IN ARKANSAS

PREPARED BY...

Regional Economic Models, Inc. (REMI)

PREPARED FOR...

Arkansas Bureau of Legislative Research

SCOTT NYSTROM, M.A.
Associate Economist

ELÍAS SCHEKER DA SILVA
Assistant Economist

1776 I Street NW
Suite 750
Washington, DC 20006
(202) 469-7159

MONDAY, MARCH 25, 2013

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report details a REMI Tax-PI analysis of the Big River Steel Project in Osceola, AR of Mississippi County for the Arkansas Bureau of Legislative Research. The $1.1 billion investment stands to be simulative to the state economy, and it would generate approximately 3,500 jobs during construction and about 1,300 during operations. The project would create about $400 million in additional annual gross domestic product (GDP) during construction and about $150 million more in additional GDP in subsequent years. The fiscal impact picture can be more mixed, depending on the exact size of the incentives offered to the project and the higher "carrying costs" to the state economy for having more jobs, GDP, and especially more population. The recycling tax credit is the biggest issue. Without it, the fiscal impact to the state is generally positive, but if the opportunity cost of the foregone revenue behind the credit counts as a liability against the state budget to the tune of $240 million, then the fiscal impact is negative. However, the net fiscal costs are relatively low compared to the economic benefits, and increasing state taxes or decreasing spending to make the budget whole again to these degrees would have a smaller effect on the state's economy than opening and operating the steel plant. The drag on Little Rock's budget and the process of it has, overall, less of an impact than the additional jobs, GDP, and economic vitality associated with the investment and operations.

INTRODUCTION

The Big River Steel Project will have a mixed impact on the Arkansas economy, depending on the criteria used to judge it and the eventual size of the incentives package offered. Big River plans to build a steel mill near Osceola, AR on the banks of the Mississippi River in the county of the same name.[1] This plant would build specialized, primary metal products for the growing energy, power, pipeline, and automotive sectors at the junction between the Southeast and Southwest regions of the United States. This project, which requires $1.1 billion in initial investment, has a complicated set of economic considerations, incentives, and fiscal impacts behind it for the state of Arkansas to consider before approving a path forward.

The Arkansas Bureau of Legislative Research contracted Regional Economic Models, Inc. (REMI) to look into these issues for the state. Taking information on the physical project and the financial incentives behind it, we analyzed the project in fiscal and economic terms. We used PI^{+}, which is our economic and demographic model of sub-national units of the United States' economy, and Tax-PI, its fiscal module for budgetary analysis. Our results include the potential economic impact of the plant as well as budgetary considerations for Little Rock. We do not mean to recommend a decision for the state—we intend to provide information, backed by the best possible economic theory, data, and methodology, in order to make the best verdict.

There are many potential criteria for making a decision. Some states with other REMI experience and project analyses, such as Connecticut, concentrate on the pure economic impact of an incentives package. They judge the idea on chief indicators, such as employment or gross domestic product (GDP). Other states approach a more budget-centric measure, like Iowa or Missouri, who look at the net impact to the budget, fiscal impact ratios, or a discounted benefit-cost analysis of additional tax revenue or GDP in the state's borders. There should be enough information in this report to make a decision by either perspective, or a host of others, depending on the audience viewpoint and how one wants to judge the figures within this white paper.

REGIONAL ECONOMIC MODELS, INC. (REMI)

REMI is a Massachusetts- and Washington, DC-based firm specializing in economic services related to modeling. It began with a research project by a professor at the University of Massachusetts-Amherst, Dr. George I. Treyz, in the 1970s when he looked into assessing the economic impact of redeveloping the I-90 corridor from Boston, then to Worcester, Springfield, and eventually out to Albany and Buffalo. In 1980, Dr. Treyz founded a firm around his research, which grew over the past thirty years to the present company. REMI provides software, support services, and issue expertise in nearly every state, the District of Columbia, and in several foreign nations. Model users are primarily in state governments, but they also include federal agencies, planning organizations, consulting firms, universities, and private industry involved in policy and infrastructure development.

Currently, in Arkansas, REMI works with the University of Arkansas-Little Rock as its primary contact. Other users and representative parties throughout the middle of the country include the Iowa Departments of Transportation and Revenue, Missouri Department of Economic Development, Texas Comptroller of Public Accounts, and the Mississippi Institutions of Higher Learning (IHL). REMI provides training support on the models' operation. This includes help with that interface, vetting data and variables, interpretation of the results, and—in cases like these—running the actual simulation, putting together a report, and finalizing the results.

[1] "Potential Rewards for Big River Steel Mill, But Risks Remain," *Arkansas Business News*, March 6, 2013, <http://www.arkansasbusiness.com/article/90745/potential-rewards-big-for-big-river-steel-mill-but-risks-remain?page=all>

THE PI+ REGIONAL MODEL

REMI used a 1-region, 70-sector model of the counties of Arkansas agglomerated to the state-level for this study. This model, which is called PI+ as a software package, included the Tax-PI module to do fiscal analysis in terms of the impact on the state's budget from the Big River Steel Project. PI+ includes four different quantitative measures in its framework, and this allows them to highlight each other's strengths and compliment their weaknesses. The four methodologies in the model include the following:

1. **Input/output tabulation** – Sometimes referred to as I/O modeling, input-output looks for the transactions between industries and households in the economy. This includes the flow of goods from firm-to-firm through their supply chains, to final sales to households, and then wages paid and spent by individuals and families. The data for the table comes from the Bureau of Labor Statistics,[2] and the theoretical foundation comes from work by Nobel laureate Wassily Leontief.
2. **Econometrics** – The REMI model includes statistical parameters for behavioral patterns and responses inside of the economy. These includes elasticity to price and wealth, the response of households and businesses to changes in prices and wages, and the "rate of adjustment" from a shock to a new stability inside of the economy.[3] Markets take time to "clear," returning to relative stability of prices and quantity and a balance between supply and demand, after a shock, which we include in the model's adjustments from year-to-year before an eventual result in the model's structure.
3. **Computable General Equilibrium** – Known as CGE models, REMI PI+ and Tax-PI are unique for including the characteristics of I/O and CGE models together. CGE modeling adds market-level concepts and the principles of equilibrium economics. These include markets for labor, as well as housing and consumer goods, composite inputs for firms, and market shares for local industry. For example, a coal plant in Arkansas produces electricity, but mines in the area are inadequate to supply its input (due to their lack of product and market share), so the model looks outward (probably to a state like Wyoming or West Virginia) to find the linkage necessary to bring the economy back to equilibrium.
4. **New Economic Geography** – This includes concepts of agglomeration, labor pooling, and economies of scale to the model. Labor-intensive industries, such as healthcare or professional services, tend to cluster in urban centers with an educated labor force with specializations in their exact areas. The same is true on goods-producing industries, which tend to locate themselves near customers, input suppliers, transport hubs, and other "environmental" factors that help them lower their costs or increase productivity. Our model includes these concepts endogenously, adjusting for clusters by region.

The research behind PI+ is public and often appeared in peer-reviewed journals. These publications include the *Journal of Regional Science*, the *American Economic Review*, and the *Review of Economics and Statistics*.[4] Save small exception, REMI only uses data from public data sources when populating the data and parameters in the model. Baseline data comes from the Bureau of Labor Statistics (BEA), BLS, U.S. Census Bureau, and the Energy Information Administration (EIA) at the United States Departments of Commerce and Energy.[5] The one exception to the federal sources is a short-term, business cycle forecast incorporated from the University of Michigan's

[2] Richard Graham, "Inter-industry relationships (Input/output matrix)," *Bureau of Labor Statistics*, February 1, 2012, <http://www.bls.gov/emp/ep_data_input_output_matrix.htm>

[3] "REMI Documentation," *REMI*, March 8, 2013, <http://www.remi.com/resources/documentation>

[4] For journalistic citations, please see p. 46 of the PDF online, "PI+ v. 1.4 Model Equations," *REMI*, March 8, 2013, <www.remi.com/download/documentation/pi+/pi+_version_1.4/PI+_v1.4_Model_Equations(2).pdf>

[5] For full listing of data sources and types, see, "Data Sources and Estimation Procedures," *REMI*, March 8, 2013, <www.remi.com/download/documentation/pi+/pi+_version_1.4/Data_Sources_and_Estimation_Procedures.pdf>

Research Seminar in Quantitative Economics (RSQE).[6] This, combined with a decade out industry-level outlook from the BLS, drives national growth in industries and the labor force. This works with county-level data on local industry mixes, wages, and demography to give the models a customized-sub-national geography with unique responses for different regions to outside shocks, including in Arkansas.

The model includes a block structure, which represent different parts of the economy:

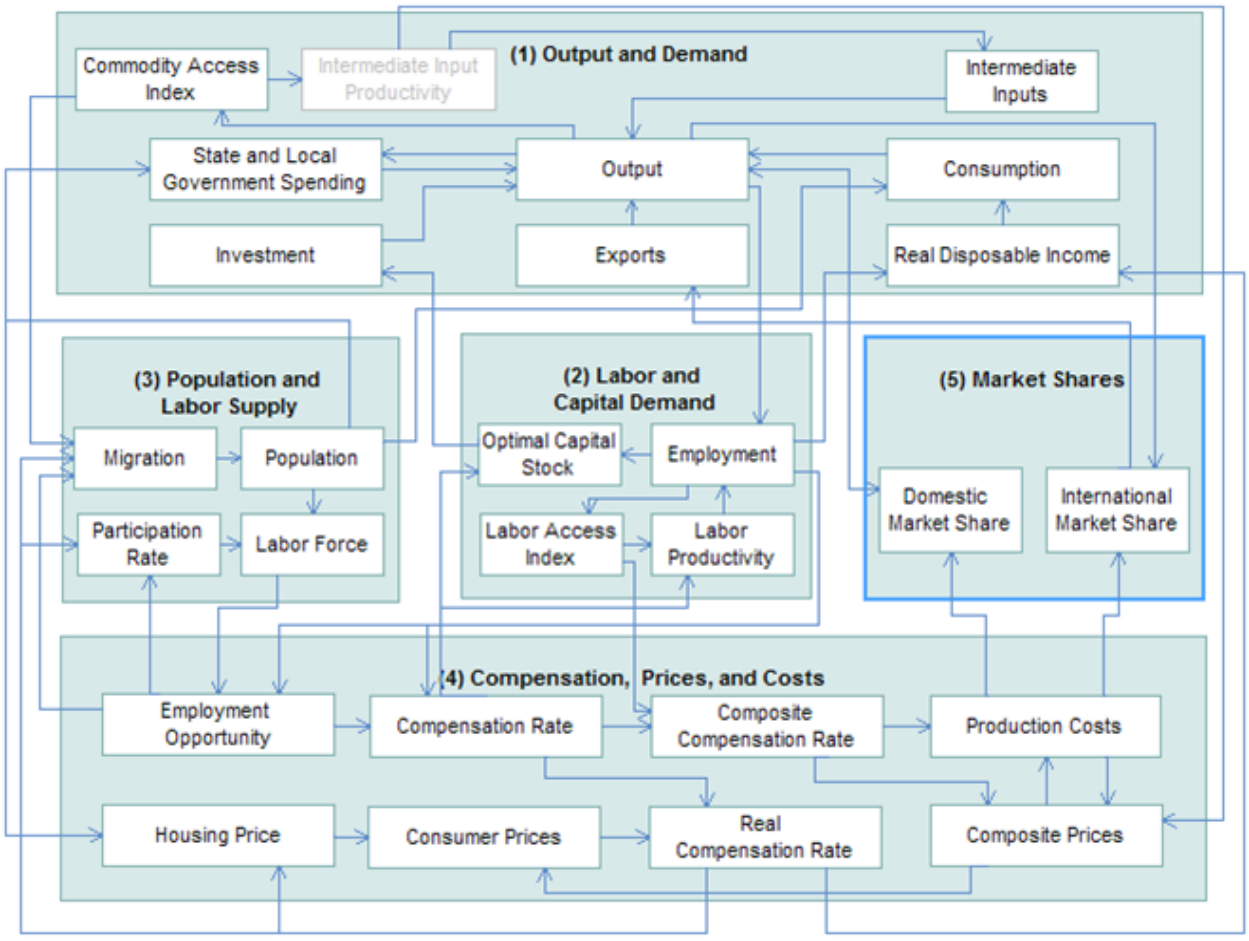

FIGURE 1 – THIS FIGURE SHOWS THE OUTLINE OF THE BLOCK STRUCTURE OF REMI MODELS. EACH "BOX" REPRESENTS SOME STOCK CONCEPT, SUCH AS POPULATION OR EMPLOYMENT. THE ARROWS SHOW THE EQUATIONS THAT RELATE THEM TOGETHER. FOR EXAMPLE, TO PICK A SIMPLE ONE, THE LABOR FORCE IS THE PARTICIPATION RATE MULTIPLIED BY THE TOTAL POPULATION. THE PARTICIPATION RATE, IN TURN, CAME FROM THE REAL WAGES PAID AND JOB AVAILABILITY FOR PEOPLE TO CONSIDER IN A REGION BEFORE MAKING THE DECISION TO LOOK FOR A JOB OR CHOOSE THEIR OWN LEISURE TIME.

Each block has its own "perspective." Block 1 is final demand and final production; it is the "macroeconomy" in terms of its total aggregates. That includes consumer spending, investment, net exports, government spending, and a subtraction for intermediate inputs in a local area. Block 2 is the business perspective on the economy,

[6] George Fulton, "RSQE specializes in economic forecasting of the U.S. and Michigan economies," *University of Michigan*, <http://rsqe.econ.lsa.umich.edu/>

where industries need to produce a certain amount of output. To do this, they need inputs (which include labor, capital, and fuel), but they will also try to minimize costs when adjusting for productivity. Block 3 is the household concept in REMI, which includes how consumers spend by region, how they chose to offer themselves on the labor force, and how intra-national migration changes a state-level economy over time. Block 4 is the strongest in the CGE component of the model and includes market concepts. These include those for labor, housing, consumer goods, costs of living, and the cost of doing business in an area for firms. Block 5 measures competitiveness for a region on the domestic and international marketplace. This includes how "skilled" an area is at keeping away imports, as well as how much it is able to export to other locals.

PI$^+$ and Tax-PI have two purposes: forecasting and analysis via simulation. The model's underlying forecast works by building in the government data and then allowing the above structure to run, out to a chosen year, without any external interruption. The model includes this "base case" so users do not have to populate the data themselves (though the software allows such customization), and it also allows analysts to have a detailed forecast of their area out to 2060. Next, a user makes exogenous—"coming from outside"—changes to the above structure. These changes, which PI$^+$ calls "policy variables," represent the direct effect of a policy on the economy. They can include changes to demand, supply, prices, and many other factors. For instance, with Big River, the actual construction and operations of the plant will involve a significant amount of additional output in Arkansas, which is a variable in Block 1. From there, the model automatically associates that with increased employment, wages, consumer spending, and migration into the state to take potential new jobs.

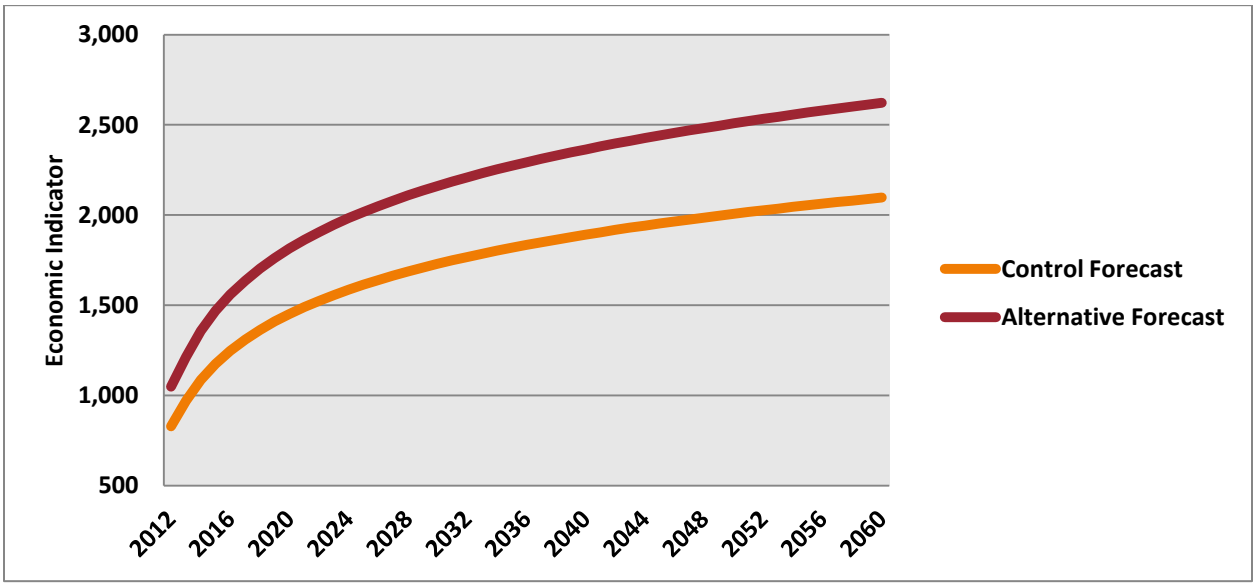

FIGURE 4 – THIS SHOWS THE BASIC ANALYTICAL PRINCIPLES OF FORECASTING AND ECONOMIC IMPACTS WITH PI$^+$ AND TAX-PI. THE ORANGE LINE IS THE BASE CASE, A "NULL HYPOTHESIS" OF MAKING NO EXTERNAL CHANGES TO THE MODEL AND ITS WORKINGS TO 2060. FROM THERE, ONE ENTERS OUTSIDE CHANGES ON THE MODEL TO REPRESENT A PROJECT, AND THE MODEL RECALIBRATES THE FORECAST TO CREATE A NEW ONE (THE RED LINE). THE TYPICAL USAGE OF THESE MODELS INVOLVES COMPARING THE DIFFERENCE (SOMETIMES CALLED "DELTA") BETWEEN THE TWO LINES TO ISOLATE THE EFFECT OF A POLICY. THIS IS THE ECONOMIC IMPACT. THE Y-AXIS HERE IS INTENTIONALLY BLANK, AND IT COULD REPRESENT A MACROECONOMIC FIGURE LIKE GROSS REGIONAL PRODUCT, AN INDUSTRY-LEVEL CONCEPT LIKE EMPLOYMENT BY HOSPITALS AND RELATED SERVICES, OR A DEMOGRAPHIC CONCEPT SUCH AS TOTAL SCHOOL-AGED POPULATION.

THE TAX-PI BUDGET MODULE

Tax-PI builds on the preexisting PI$^+$ framework in the previous section to give the REMI model an explicit budget concept at the state-level, including revenue categories, expenditure projections, and assumptions about how to maintain a balanced budget in the future.[7] Its first launch was in 2011, and it sees widespread throughout the United States for the purpose of unifying fiscal impacts with economic impact analysis. Tax-PI users include the legislature in Florida, Departments of Revenue in Mississippi, Louisiana, Kansas, and Iowa,[8] and a few national membership organizations interested in specific policy issues and their effects on state budgets, such as Medicaid expansion under the Affordable Care Act (ACA).[9] Tax-PI is an appropriate tool for analysis in this case, given its consistency between the economics and fiscal issues, and the importance of both issues in terms of the eventual decision by Little Rock about the incentives and the Big River Steel Plant.

Tax-PI works by associating certain types of economic activity or demographic characteristics with categories in a state- or city-level budget. For example, an increase in consumption in alcohol by households and tourists would, naturally, lead to an increase in alcoholic beverage tax revenue, general sales tax revenue, or other fees for the government. The same is true of a general sales tax (while exempting categories outside of its purview, such as groceries, fuel, electricity, and services also bought by households). While all of these usually have a statutory rate associated with them, such as 5% or 6% or more for most states, Tax-PI uses an "effective rate" of historical revenue divided by historical and projected spending on different categories. For example, the law may set the rate as 10%, but if historical revenue is $100 while historical spending is $2,500, then Tax-PI will prefer the observed, empirical effective rate of 4% over the book rate of 10%. This accounts for any uniqueness in the code and issues of noncompliance in actual, observed revenue within a jurisdiction. The model does the same for income taxes (which come from total wage income), property taxes (the value of residential and nonresidential capital stocks), and business taxes and fees (based on their regional production).

Expenditure forecasting in Tax-PI works in a similar manner, but it instead relies on demography to drive the "carrying cost" of a state's economy and populace. For instance, users often have the total population of children from age 5 to age 18 project K-12 expenditures. If this cohort grows, there is more of a demand for spending in this area; there would be a greater need for teachers, classroom materials, square footage for classes, and anything else needed to educate children. The same is true of postsecondary education in state universities, but that projection would rely on the cohort from age 18 to 22. Other categories, such as corrections spending or the spending on state highways, relies on the prison population and some combination of trucking output, household spending on vehicles and gasoline, and total VMT, respectively. This representation of the costs of providing for a state population is unique to Tax-PI, and it oftentimes yields very different results from other analysis in the same area. For example, a Toyota plant in eastern Tennessee might generate a significant amount of economic activity and tax revenue, but the additional population relocating might drive up local expenditures and lead to a mixed picture, a wash, or even a net loss from a *purely* budgetary perspective. This makes Tax-PI a more comprehensive way to assess the budgetary implications of any economic change.

---

[7] "Tax-PI," *REMI*, March 8, 2013, <http://www.remi.com/products/tax-pi>

[8] Tina Hoffman and Victoria Daniels, "Analysis shows Iowa Fertilizer Co.'s Lee County Project will result in $153 million in Additional State Tax Revenue," *Iowa Economic Development Authority*, February 27, 2013, <http://www.iowaeconomicdevelopment.com/newsdetails/5652>

[9] Amy Rohling McGee, William Hayes, Rod Motamedi, and Stan Dorn, "Expanding Medicaid in Ohio: preliminary analysis," *Health Policy Institute of Ohio*, *The Ohio State University*, *Urban Institute*, *REMI*, January 18, 2013, <http://a5e8c023c8899218225edfa4b02e4d9734e01a28.gripelements.com/pdf/publications/oh_medicaid_expansion_study_1_15_2013_final_numbered.pdf>

Tax-PI includes a feedback mechanism to plan for balanced budgets. Without this constraint, expenditures and revenues may move independently with each other, which is analytical useful but not always an accurate picture of the realities of state budget planning. It does this through a "what if" hierarchy—in the case of a surplus, does the state chose to spend the money or cut taxes, in the case of a deficit, does the state chose to raise taxes or cut spending, or what mixture amid the same. This feedback keeps the state in a fiscal constraint, but it can obscure the independent impact of a project by introducing a fiscal feedback, which can confuse the effects of a policy in isolation. For this analysis, we chose first to leave the feedback off, giving the results as the structural impact of Big River before making any assumptions about an explicit fiscal response in budgeting.

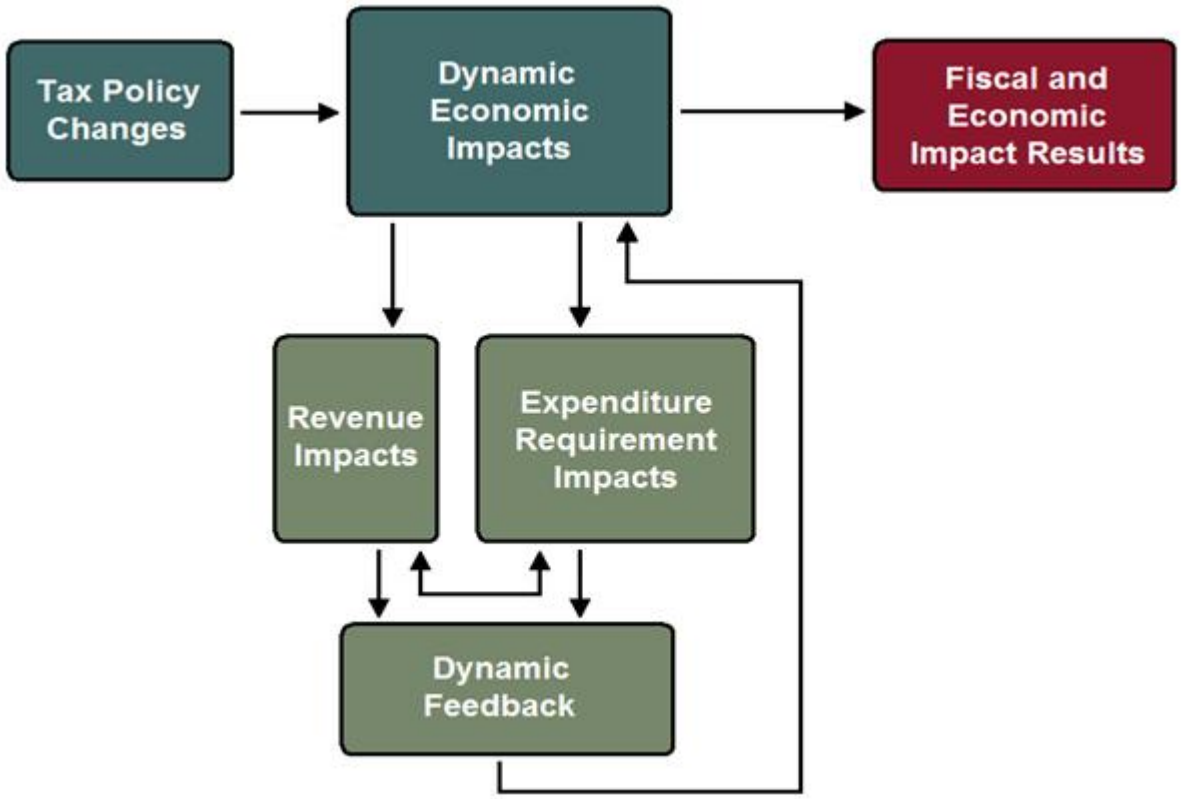

FIGURE 3 – THIS SHOWS THE GENERAL STRUCTURE OF TAX-PI. THE TEAL PORTIONS ARE THE PREEXISTING PI^{+}, WHICH DOES ECONOMIC ANALYSIS OF THE DIRECT IMPACTS OF TAX POLICIES AND OTHER SITUATIONS. THE NEW PORTION IS BELOW, IN GREEN, WHERE THE MODEL ASSOCIATES ECONOMIC AND DEMOGRAPHIC FORECASTS AND IMPACTS WITH SPECIFIC TYPES OF REVENUE AND EXPENDITURES. FROM THERE, THE MODEL ALLOWS THEM TO INTERACT AND INCLUDES A DYNAMIC FEEDBACK PORTION FOR SCORING AND FOR CREATING BALANCED BUDGET CONSTRAINTS. THESE BUDGET CONCEPTS GO BACK INTO THE ECONOMIC MODEL IN AN ITERATIVE PROCESS TO THE POINT THEY ALL BALANCE, AND THEN THE MODEL EVENTUAL GENERATES ECONOMIC IMPACT RESULTS WITH ADDITIONAL DETAILS ON FISCAL CHARACTERISTICS OF A PROJECT ANALYSIS.

Tax-PI requires calibration from actual state budget data. For this, we used public data on the website of the Arkansas Department of Finance and Administration to create the Tax-PI budget tables.[10] This data allows us to

[10] "Arkansas' Budget Brochure," *Arkansas Department of Finance and Administration*, March 8, 2013, <http://www.dfa.arkansas.gov/offices/budget/Pages/default.aspx>

have a close approximation of the fiscal responses from the Big River Steel Plant, although it is not as detailed as a line-item appraisal of the budget with the most recent, internal data possible from the state. Major revenue categories in this analysis include the individual income, corporate income, and sales and use taxes for the state of Arkansas. These will, in turn, rise and fall in their revenue projections as the state economy changes in reaction to the new steel plant. Expenditure categories include public schools, the institutions of higher learning, health and human services, and general government overhead and administrative costs.[11]

Modeling the Big River Steel Project in REMI

Inputting the information about this project into Tax-PI requires four main sets of variables. Those are the initial construction and capital investment to build the plant, its long-term operations over its project lifecycle, the cost of the state to pay back its bonds, and the offset of the incentives offered the direct project. Each of these goes into the model in their own way and has their own influence over the eventual net economic and fiscal impact. This table describes how each of them went into the model before generating results:

Category	Specific Item	Policy Variables
Construction	• 2,000 construction jobs for 20 months • $1.1 billion total capital investment	• Annualized industry employment in construction • Upward adjustment of the baseline productivity
Operations	• 525 fulltime jobs at operation • $75,000 average annual wages	• 525 fulltime jobs in primary metal product manufacturing • Adjusted average wages to match the $75,000 required • Adjusted productivity to keep real output of the plant constant
Bond Repayment	• Bond repayment schedule for the state of Arkansas for the $125 million	• Negative government spending to adjust for bond repayment
Incentives	• Education and training programs • Arkansas Advantage Program exempting direct taxes on the project for creating net new payroll in the state • PILOT program to lower regular *ad valorem* assessment to 35% of the normal amount • Tax exemptions on purchases made for construction materials, machinery, and equipment for operations • Exempted sales tax revenue from the purchase of natural gas and electricity • Recycling equipment tax credit to reduce net tax burden on Big River	• Demand for education and training services in Arkansas • Less corporate income to the state for the exemption • Reduced tax revenue in *ad valorem* categories for the state • Reduced tax revenue for the state over capital investments • Reduced revenue to the state for less fuel/energy tax income • Opportunity cost of the lost revenue to tax credits

Table 1 – This shows how we translated project information into REMI variables, which the model then took to simulate and create the economic and fiscal impacts in the results section. Information on where the exact numbers came from is on the next page.

[11] "2012 General Revenue Flowchart," *Arkansas Department of Finance and Administration*, March 8, 2013, <http://www.dfa.arkansas.gov/offices/budget/Documents/fy12_gr_flowchart.pdf>

Arkansas Bureau of Legislative Research provided much of this data to REMI. To list these explicitly, REMI used their documentation to include the 2,000 construction jobs, $1.1 billion in initial investment, the 525 fulltime jobs upon plant opening, and the $75,000 annual wages for its employees. Lacking a number on the anticipated sales for the Big River Steel Plant, REMI used an estimation of the state-level average output for 525 employees in the primary metal manufacturing in NAICS 331,[12] which is approximately $650,000 per worker in 2013, or about $350 million in annual real output once the project opens. The "baseline" construction industry[13] in Tax-PI includes any sort of construction, including *relatively* unproductive ones such as building housing or commercial space. Hence, we had to adjust the labor productivity of the construction project upwards to equal the $1.1 billion by the end of 2014. We spread inputs equally across 2013 and 2014 for the build phase.

The cost and consideration of the incentives package is the most complex part of the modeling. It required outside estimations of the size of the incentives based on data from the Arkansas Bureau of Legislative Research and data inside of the 1-region Tax-PI model of the state. Additionally, the terminology behind what is an "incentive" for Big River (i.e. something unique to the project itself) and a general provision in the tax code, which any firm in the state may claim under equal conditions, is complicated. For this, we relied on the structure of Tax-PI to decide the final nature of our analysis and its underlying methodology of effective rates. If Tax-PI would originally want to "collect" more revenue in the model because of the project, but it was exempted due to an incentive/general law, we took it out of the collections. Therefore, our numbers are consistent with the effective tax policies of the state of Arkansas. This table here shows the methodology, in each case, and how we used any external data to create an estimation of the size of each of the offered incentives in the package:

Incentive	Methodology
Arkansas Advantage	The "Big Steel Recommendation Report" by Delta Trust Investments, Inc. included a table on the expected tax credit offered to Big River, by year, which we included.
PILOT	Using the effective corporate tax rate from Tax-PI, we calculated the expected direct tax paid by Big River by year. Then, we multiplied this number by 0.35 to find the actual expected tax revenue from the project. We subtracted the difference (or 0.65 of the original) from the revenue categories in Tax-PI to adjust downwards for the exemption.
TAX BACK	Using information from the I/O table,[14] we estimated the total intermediate and capital costs associated with the $1.1 billion initial investment. Specifically, we exempted the cost of labor inputs in the form of wages for construction. After that, using the effective rate for corporate taxes, we subtracted this revenue to show the exemption of construction equipment, machinery, and other capital purchases for the operating of the plant.
Utility Purchases	Again using the I/O table, we estimated the dollar values of the purchases of natural gas and electricity from Big River. We adjusted the rate on these purchases from the regular 2.5% down to 0% and removed that revenue from the Tax-PI category.
Recycling Equipment	Delta Trust Investments, Inc. also detailed how the plant could have as much as $240 million in tax credits over the next fourteen years. The plant intends to "recycle" scrap metal, which technically makes it eligible for the credit. We modeled the opportunity cost of this credit with figures from Delta Trust in two ways: one with the full amount of the credit claimed over fourteen years, and one where the credit is not claimed. There are several factors behind how the credit may or not be counted, including the firm's profitability and the types of equipment it uses. We chose to do a **sensitivity analysis** of having one case with total claims and one case with none.

[12] "331 Primary Metal Manufacturing," *North American Industrial Classification System*, March 8, 2013, <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=331&search=2012%20NAICS%20Search>

[13] "23 Construction: The Sector as a whole," *North American Industrial Classification System*, March 8, 2013, <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=23&search=2012%20NAICS%20Search>

[14] See n. 2 on p. 4

TABLE 2 – THIS DESCRIBES THE ESTIMATION METHODOLOGY FOR EACH OF THE TYPES OF INCENTIVES. MOST OF THE CALCULATIONS RELIED ON THE DELTA TRUST INVESTMENTS, INC. REPORT, INTERNAL GROWTH RATES IN THE MODEL OR THE I/O TABLE FROM THE BLS ON CAPITAL PORTIONS OF OUTPUT AND FUEL PURCHASES FOR THE CONSTRUCTION AND PRIMARY METAL MANUFACTURING SECTORS.

The bond repayment came out of potential state spending over the repayment schedule provided by Bureau of Legislative Research. We modeled this as a downward adjustment in potential state spending. This represents the opportunity cost of this foregone spending; for example, if the state needs to repay $50 of its loan this year, that means $50 less of potential spending to other categories like healthcare, transportation, or education. The same is true of the incentives. While they may not represent a direct cost to the state, one still needs to make a downward adjustment to potential revenue given the incentives. Tax-PI would want to tax the direct output and production of the construction and primary metals industries because of their existence in the state, so the model needs some exogenous information to let it know that this money is not collected due to the incentive. Again, this does not represent a cost, but a reduction of revenue, which changes the potential revenue/cost ratio for the project at its final calculation in the results of the fiscal impact analysis.

Active	Edit	Category	Notes
⊞ ☑	✎	Composite (1 PV-s)	Industry employment of 525
⊞ ☑	✎	Composite (1 PV-s)	Downward productivity adjustment to adjust for growth over time
⊞ ☑	✎	Composite (1 PV-s)	Construction jobs
⊞ ☑	✎	Composite (1 PV-s)	Construction productivity adjustment to $1.1 billion
⊞ ☑	✎	Composite (1 PV-s)	Wage adjustment of 525 mill employees
⊞ ☑	✎	Composite (1 PV-s)	Education and training investment
⊞ ☑	✎	Composite (1 PV-s)	Bond repayment by state
⊞ ☑	✎	Composite (1 PV-s)	Arkansas Advantage Program
⊞ ☑	✎	Composite (1 PV-s)	PILOT
⊞ ☑	✎	Composite (1 PV-s)	TAXBACK
⊞ ☑	✎	Composite (1 PV-s)	Utility franchise fee
⊞ ☑	✎	Composite (1 PV-s)	Recycling tax credit

FIGURE 4 – THIS IS A SCREEN CAPTURE FROM THE ACTUAL TAX-PI SOFTWARE BUILD USED FOR THIS ANALYSIS, AND IT SHOWS THE CATEGORY OF VARIABLES INCLUDED. THIS INCLUDES THE UPSIDE OF THE PROJECT IN ECONOMIC TERMS, SUCH AS INCREASED CONSTRUCTION AND PRODUCTION ACTIVITY, BUT AS WELL THE DOWNSIDE, WHICH IS IN THIS CASE THE NET COST TO THE STATE TO PAY FOR THE INITIAL BONDS AND THE FOREGONE REVENUE FROM THE UPSIDE DUE TO THE VARIOUS INCENTIVES. PLEASE NOTE THE RECYCLING TAX CREDIT ONLY OPERATES FOR THE FIRST FEW YEARS, WHICH MEANS THIS IS A "BEST CASE" OF THE LAW HITTING A SUNSET AND THE TOTAL COST OF THE INCENTIVES PACKAGE DROPPING GREATLY.

ECONOMIC IMPACT RESULTS

This section details the economic impact of the project from Tax-PI from the given inputs, above assumptions, and the characteristics of Arkansas in the model. **The economic impact of this project should take consideration of its fiscal impact, given that we did not force a balance budget in this simulation.** This was intentional, as it required us to make assumptions about how Little Rock would respond to fiscal imbalances in the form of new taxes and different spending patterns. Hence, the economic impacts need some involvement of the fiscal impacts, given that fiscal adjustments (again, taxes and spending) will impact the economy to give a final impact of project. Our results here include major macroeconomic indicators, such as total employment, GDP, total output, population changes, and disposable personal income. The numbers here are the difference from a baseline that does not include the Big River Steel Project versus one that does include it given the inputs from the previous section. The project would have a generally positive impact by itself on the economy, which should not be a surprise given the input of hundreds of jobs and over a billion dollars. However, this story becomes more complicated when considering the high cost of some of the incentives involved with the project.

Total Employment

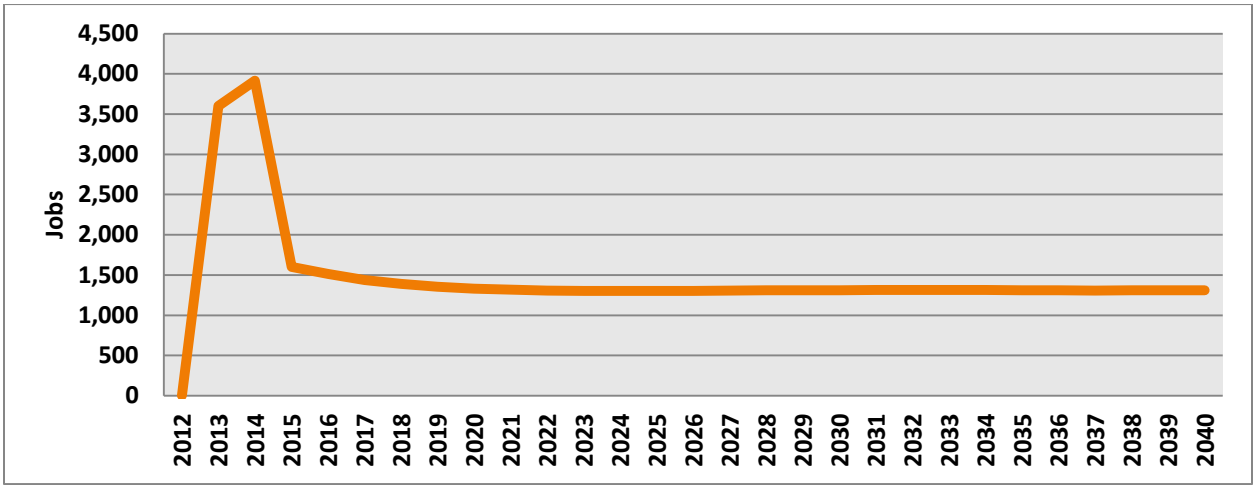

Figure 5 – This graph shows the anticipated employment impact of the Big River Steel Project. These are job-year concepts, not a rolling amount of job creation. The best way to interpret it is, for example, "in 2020, because of the plant, Arkansas would have about 1,300 jobs more than it would have under the baseline." The initial construction boom generates between 3,500 and 4,000 jobs, which then give way to a stability of around 1,300 total jobs when the steel plant operates with its 525 fulltime workers. This gives a jobs multiplier of about 2.5, which is not unreasonable for a high value-added manufacturer like primary metals.

Gross Domestic Product

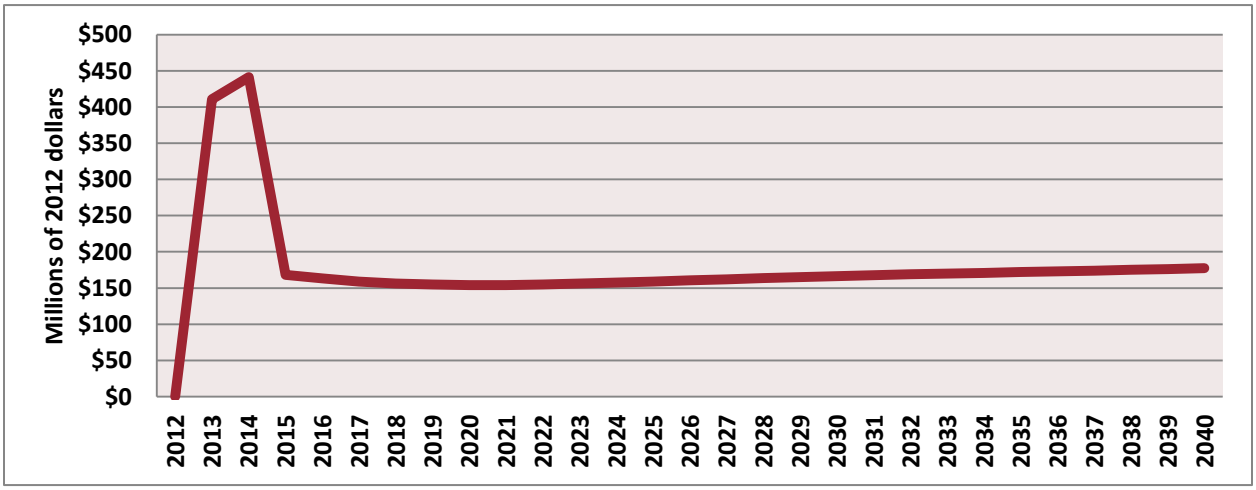

Figure 6 – The trend for GDP follows a similar pattern to that for employment. This makes sense, as more jobs lead to more production and value-added, which is GDP by another definition. The construction boom adds about $425 million a year to the Arkansas economy, while the long-term operations of the plant adds about $150 million in each year, depending on the exact year and productivity increases in the indirect and induced industries.

Output

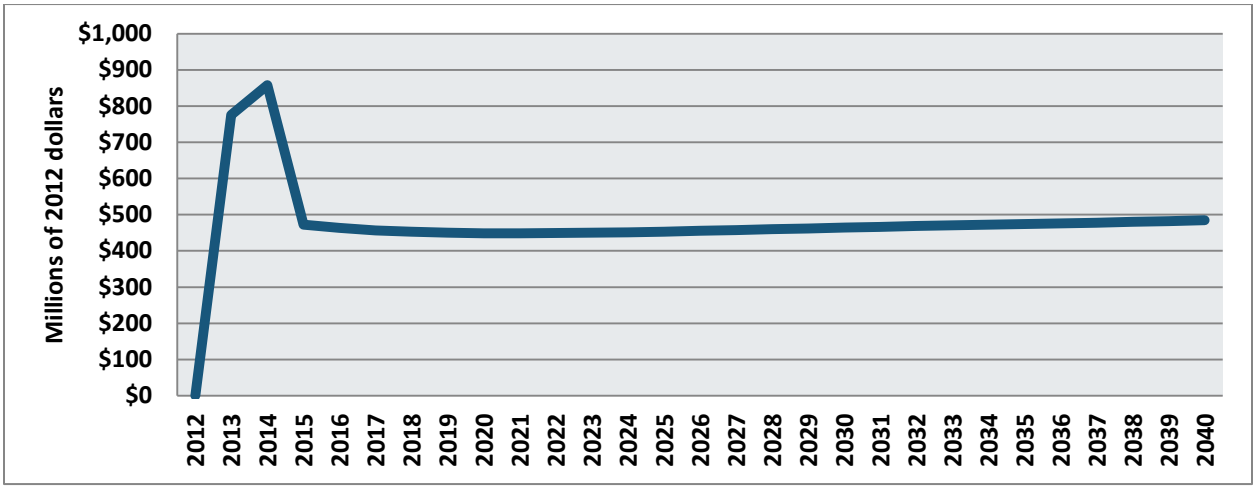

Figure 7 – Output follows the same trend as GDP. REMI defines output as the sum of business sales and production, which are equal concepts. It is also the same as GDP without subtracting for the value of intermediate inputs. This gives the business perspective on the development of the economy with the steel plant, and Arkansas industry could expect about $450 million in additional sales orders once the plant start opening on the whole. This number includes the $350 million in direct output from Big River that we estimated.

Real Disposable Personal Income

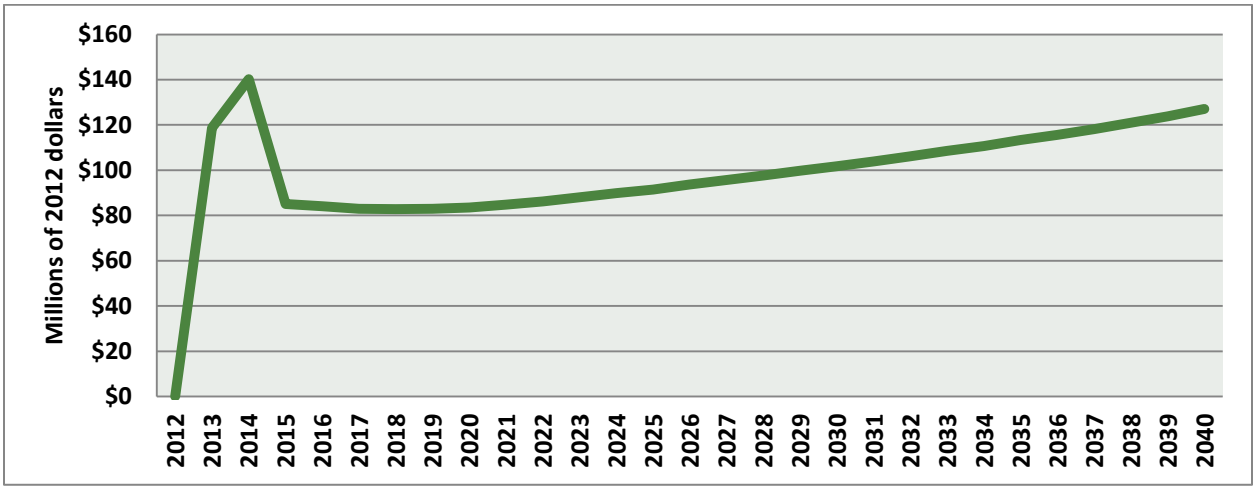

Figure 8 – This is the portion of value-added and output paid to wages and salaries after taking out federal, state, and local taxes. The project has a good potential to increase income in the state, giving an initial boost of around $140 million a year during the construction phrase and about $80 million at the beginnings of operations. This number continues to grow over time as the number of jobs remain steady and real wages grow slowly throughout the 2020s and 2030s as the economy expands with productivity increases leading to labor income.

Population

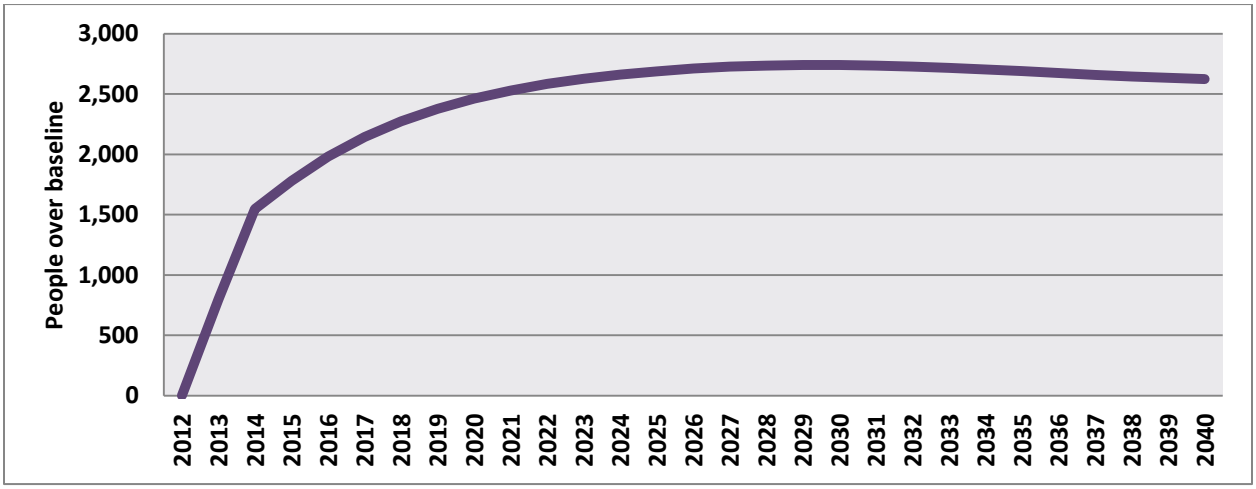

Figure 9 – REMI PI+ and Tax-PI are unique for including a response to population and migration within the United States due to changing economic conditions. It does this through an equation that links labor market conditions—unemployment rates, expected wages, and cost of living—to how households make their location decisions. For example, if an area has a large quantity of unfilled jobs and a low cost of living (a general trend throughout the South and West of the United States), then people are more likely to move there to take up those jobs and low costs. This is the situation on the margin in the simulation, where the 1,300 jobs and $120 million in disposable income attracts about 2,500 more people to live in the region.

Percentage Changes

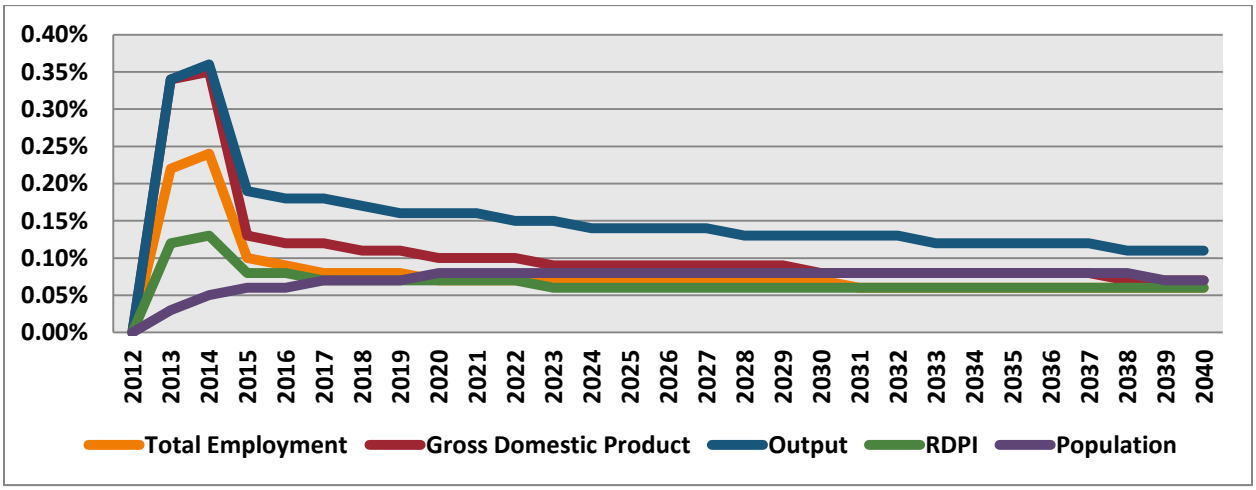

Figure 10 – This shows the percentage change of the impact against the underlying Arkansas economy. For context, Arkansas in 2013 has about 1.6 million jobs, produces $125 billion in annual GDP, and has a population of about 3 million. The steel plant would change the economy of the state by about 0.3% initially and then 0.1% against this base.

TABLE 3 – OUTPUT BY INDUSTRY (MILLIONS OF 2012 DOLLARS)

NAICS Industries	2013	2014	2015	2020	2025	2030	2035	2040
Forestry and logging; Fishing, hunting, and trapping	$0.090	$0.033	-$0.125	-$0.230	-$0.228	-$0.210	-$0.192	-$0.176
Agriculture and forestry support activities	$0.011	$0.010	$0.000	-$0.003	-$0.003	-$0.002	-$0.002	-$0.001
Oil and gas extraction	$0.036	$0.017	-$0.023	-$0.069	-$0.071	-$0.066	-$0.059	-$0.056
Mining (except oil and gas)	$0.143	$0.172	$0.221	$0.210	$0.208	$0.191	$0.166	$0.142
Support activities for mining	$0.054	-$0.044	-$0.226	-$0.495	-$0.438	-$0.393	-$0.400	-$0.467
Utilities	$2.685	$4.245	$9.751	$9.603	$9.923	$9.943	$9.734	$9.505
Construction	$579.368	$586.764	$19.556	$10.556	$8.798	$9.005	$9.580	$11.123
Wood product manufacturing	$4.718	$4.751	$0.173	-$0.055	-$0.084	-$0.076	-$0.072	-$0.070
Nonmetallic mineral product manufacturing	$3.138	$3.251	$0.589	$0.509	$0.484	$0.481	$0.477	$0.469
Primary metal manufacturing	$0.277	$57.147	$349.195	$351.507	$354.307	$357.710	$361.507	$365.651
Fabricated metal product manufacturing	$5.770	$6.066	$1.919	$1.549	$1.325	$1.212	$1.129	$1.054
Machinery manufacturing	$0.309	$0.321	$0.141	$0.022	-$0.089	-$0.165	-$0.231	-$0.300
Computer and electronic product manufacturing	$0.053	$0.047	$0.038	-$0.037	-$0.060	-$0.068	-$0.076	-$0.087
Electrical equipment and appliance manufacturing	$1.098	$1.070	$0.160	-$0.156	-$0.316	-$0.415	-$0.498	-$0.571
Motor vehicles, bodies and trailers, and parts manufacturing	$0.618	$0.662	$0.281	$0.107	$0.015	-$0.049	-$0.101	-$0.150
Other transportation equipment manufacturing	$0.010	-$0.027	-$0.085	-$0.218	-$0.278	-$0.312	-$0.340	-$0.368
Furniture and related product manufacturing	$0.133	$0.099	-$0.063	-$0.137	-$0.141	-$0.136	-$0.132	-$0.134
Miscellaneous manufacturing	$0.052	$0.050	$0.017	-$0.020	-$0.036	-$0.044	-$0.051	-$0.058
Food manufacturing	$0.049	-$0.229	-$0.576	-$1.094	-$1.084	-$1.010	-$0.953	-$0.922
Beverage and tobacco product manufacturing	$0.074	$0.078	$0.035	$0.012	$0.011	$0.011	$0.008	$0.004
Textile mills; Textile product mills	$0.002	-$0.001	-$0.006	-$0.011	-$0.009	-$0.007	-$0.006	-$0.007
Apparel manufacturing; Leather and allied product manufacturing	$0.029	$0.033	$0.019	$0.017	$0.021	$0.023	$0.023	$0.022
Paper manufacturing	$0.699	$0.824	$0.896	$0.977	$0.904	$0.825	$0.728	$0.622
Printing and related support activities	$0.345	$0.388	$0.247	$0.191	$0.187	$0.184	$0.176	$0.164
Petroleum and coal products manufacturing	$1.067	$1.078	$0.184	$0.077	$0.067	$0.068	$0.063	$0.053
Chemical manufacturing	$0.334	$0.251	-$0.065	-$0.346	-$0.408	-$0.420	-$0.437	-$0.455
Plastics and rubber product manufacturing	$1.816	$1.830	$0.257	$0.005	-$0.116	-$0.184	-$0.230	-$0.267
Wholesale trade	$19.181	$22.693	$20.063	$19.501	$19.690	$21.221	$23.313	$25.473
Retail trade	$22.743	$24.827	$8.526	$7.282	$7.365	$7.787	$8.150	$8.543
Air transportation	$0.039	$0.034	$0.006	-$0.009	-$0.007	-$0.002	-$0.001	-$0.002
Rail transportation	$0.023	$0.032	$0.136	$0.097	$0.099	$0.108	$0.118	$0.125
Water transportation	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000
Truck transportation	$1.652	$1.839	$1.332	$1.207	$1.252	$1.334	$1.421	$1.492
Couriers and messengers	$0.054	$0.053	$0.021	$0.000	$0.001	$0.005	$0.009	$0.011
Transit and ground passenger transportation	$0.043	$0.043	$0.013	$0.004	$0.009	$0.014	$0.016	$0.018
Pipeline transportation	-$0.001	-$0.005	-$0.008	-$0.017	-$0.016	-$0.014	-$0.012	-$0.011
Scenic transportation; Support activities for transportation	$0.027	$0.000	-$0.033	-$0.109	-$0.120	-$0.118	-$0.122	-$0.131
Warehousing and storage	-$0.011	-$0.061	-$0.103	-$0.203	-$0.210	-$0.208	-$0.214	-$0.225
Publishing industries, except Internet	$0.318	$0.346	$0.174	$0.112	$0.147	$0.192	$0.227	$0.258
Motion picture and sound recording industries	$0.005	$0.005	$0.001	-$0.002	-$0.002	-$0.001	-$0.001	-$0.001
Internet publishing and broadcasting; ISPs, search portals, and data	$0.645	$0.755	$0.457	$0.493	$0.570	$0.644	$0.706	$0.769
Broadcasting, except Internet	$0.146	$0.147	$0.064	$0.032	$0.037	$0.046	$0.052	$0.056
Telecommunications	$1.818	$1.860	$0.490	$0.125	$0.142	$0.208	$0.243	$0.262
Credit intermediation; Funds, trusts, & other financial	$3.451	$3.575	$1.372	$0.706	$0.663	$0.737	$0.795	$0.857
Securities, commodity contracts, investments	$0.342	$0.293	$0.083	-$0.135	-$0.092	-$0.029	-$0.001	$0.011
Insurance carriers and related activities	$0.286	$0.306	$0.148	$0.091	$0.103	$0.118	$0.122	$0.123
Real estate	$10.946	$11.877	$4.854	$0.816	$0.582	$0.908	$0.770	$0.641
Rental and leasing services; Leasers of nonfinancial assets	$7.135	$7.496	$1.990	$1.734	$1.872	$2.134	$2.429	$2.752
Professional, scientific, and technical services	$17.965	$18.490	$4.187	$3.094	$3.555	$4.194	$4.696	$5.129
Management of companies and enterprises	$0.151	-$0.134	-$0.067	-$0.749	-$0.535	-$0.262	-$0.079	$0.018
Administrative and support services	$7.304	$8.185	$5.710	$5.258	$5.639	$6.203	$6.743	$7.280
Waste management and remediation services	$0.999	$1.207	$1.166	$0.775	$0.834	$0.920	$1.001	$1.086
Educational services	$0.330	$1.142	$1.015	$0.303	$0.349	$0.381	$0.393	$0.382
Ambulatory health care services	$8.640	$9.150	$4.632	$3.651	$3.973	$4.800	$5.672	$6.719
Hospitals	$2.376	$2.791	$1.762	$1.929	$2.460	$2.843	$2.947	$2.958
Nursing and residential care facilities	$1.042	$1.281	$0.866	$1.096	$1.406	$1.705	$1.917	$2.111
Social assistance	$0.133	$0.174	$0.129	$0.161	$0.196	$0.227	$0.249	$0.269
Performing arts and spectator sports	$0.341	$0.398	$0.259	$0.248	$0.262	$0.278	$0.288	$0.298
Museums, historical sites, zoos, and parks	$0.034	$0.042	$0.026	$0.030	$0.036	$0.041	$0.044	$0.046
Amusement, gambling, and recreation	$0.183	$0.196	$0.095	$0.055	$0.055	$0.060	$0.060	$0.059
Accommodation	$0.504	$0.447	$0.062	-$0.160	-$0.122	-$0.069	-$0.044	-$0.031
Food services and drinking places	$4.201	$5.152	$3.715	$3.945	$4.259	$4.446	$4.479	$4.458
Repair and maintenance	$4.993	$5.439	$2.691	$2.534	$2.677	$2.860	$2.996	$3.120
Personal and laundry services	$1.508	$1.576	$0.832	$0.553	$0.502	$0.510	$0.520	$0.539
Membership associations and organizations	$1.075	$1.150	$0.392	$0.367	$0.526	$0.660	$0.727	$0.762
Private households	$0.139	$0.144	$0.070	$0.044	$0.043	$0.048	$0.055	$0.066

TABLE 4 – EMPLOYMENT BY INDUSTRY (JOBS)

NAICS Industries	2013	2014	2015	2020	2025	2030	2035	2040
Forestry and logging; Fishing, hunting, and trapping	0	0	-1	-1	-1	-1	0	0
Agriculture and forestry support activities	0	0	0	0	0	0	0	0
Oil and gas extraction	0	0	0	0	0	0	0	0
Mining (except oil and gas)	1	1	1	1	1	1	0	0
Support activities for mining	0	0	-1	-1	-1	-1	-1	-1
Utilities	4	6	13	11	11	9	8	7
Construction	1,854	1,931	200	98	75	72	73	80
Wood product manufacturing	21	21	1	-1	-1	-1	-1	-1
Nonmetallic mineral product manufacturing	13	13	2	2	2	1	1	1
Primary metal manufacturing	0	90	537	533	531	529	528	527
Fabricated metal product manufacturing	24	24	7	5	3	1	0	-1
Machinery manufacturing	1	1	0	0	-1	-1	-2	-2
Computer and electronic product manufacturing	0	0	0	0	0	0	0	0
Electrical equipment and appliance manufacturing	4	4	0	-1	-1	-1	-1	-1
Motor vehicles, bodies and trailers, and parts manufacturing	1	1	0	0	0	0	-1	-1
Other transportation equipment manufacturing	0	0	0	-1	-1	-1	-1	-1
Furniture and related product manufacturing	1	1	0	-1	-1	-1	-1	-1
Miscellaneous manufacturing	0	0	0	0	0	0	0	0
Food manufacturing	0	-1	-2	-4	-4	-3	-3	-3
Beverage and tobacco product manufacturing	0	0	0	0	0	0	0	0
Textile mills; Textile product mills	0	0	0	0	0	0	0	0
Apparel manufacturing; Leather and allied product manufacturing	0	0	0	0	0	0	0	0
Paper manufacturing	1	2	2	2	1	1	1	0
Printing and related support activities	2	2	1	1	1	1	0	0
Petroleum and coal products manufacturing	0	0	0	0	0	0	0	0
Chemical manufacturing	0	0	0	-1	-1	0	0	0
Plastics and rubber product manufacturing	6	6	1	-1	-2	-3	-3	-3
Wholesale trade	94	108	94	82	74	72	71	70
Retail trade	323	344	115	87	79	75	70	65
Air transportation	0	0	0	0	0	0	0	0
Rail transportation	0	0	0	0	0	0	0	0
Water transportation	0	0	0	0	0	0	0	0
Truck transportation	10	11	7	6	6	6	6	7
Couriers and messengers	0	0	0	0	0	0	0	0
Transit and ground passenger transportation	1	1	0	0	0	0	0	0
Pipeline transportation	0	0	0	0	0	0	0	0
Scenic transportation; Support activities for transportation	0	0	0	-1	-1	-1	-1	-1
Warehousing and storage	0	-1	-1	-2	-2	-2	-2	-2
Publishing industries, except Internet	1	1	0	0	0	0	0	0
Motion picture and sound recording industries	0	0	0	0	0	0	0	0
Internet publishing and broadcasting; ISPs, search portals, and data	3	3	2	1	1	1	1	1
Broadcasting, except Internet	1	1	0	0	0	0	0	0
Telecommunications	3	3	1	0	0	0	0	0
Credit intermediation; Funds, trusts, & other financial	10	11	4	2	2	3	3	3
Securities, commodity contracts, investments	3	3	1	-1	-1	0	0	0
Insurance carriers and related activities	1	1	1	0	1	1	1	1
Real estate	35	37	15	3	4	6	6	7
Rental and leasing services; Leasers of nonfinancial intangible assets	20	21	5	4	4	4	4	4
Professional, scientific, and technical services	147	149	33	23	25	29	31	32
Management of companies and enterprises	1	-1	0	-3	-2	-1	0	0
Administrative and support services	139	154	105	90	90	91	92	92
Waste management and remediation services	5	6	6	4	4	5	5	5
Educational services	5	19	17	5	6	7	7	7
Ambulatory health care services	74	78	39	31	35	43	51	61
Hospitals	19	22	14	15	19	21	22	21
Nursing and residential care facilities	16	19	13	17	21	25	28	30
Social assistance	3	4	3	4	5	7	8	9
Performing arts and spectator sports	9	10	7	6	6	6	5	5
Museums, historical sites, zoos, and parks	0	0	0	0	0	0	0	0
Amusement, gambling, and recreation	4	4	2	1	1	2	2	2
Accommodation	5	4	1	-1	-1	0	0	1
Food services and drinking places	76	92	66	65	66	64	60	56
Repair and maintenance	53	57	28	25	25	25	25	24
Personal and laundry services	24	25	13	8	7	7	7	7
Membership associations and organizations	16	17	6	5	8	9	10	10
Private households	20	20	10	6	5	5	6	6

TABLE 5 – EMPLOYMENT BY OCCUPATION (JOBS)

SOC Occupations	2013	2014	2015	2020	2025	2030	2035	2040
Top executives	72	76	27	20	19	19	18	18
Advertising, marketing, promotions, public relations, and sales managers	8	9	5	4	4	4	4	4
Operations specialties managers	23	26	19	17	16	17	17	17
Other management occupations	75	79	18	12	12	12	12	12
Business operations specialists	98	105	35	28	28	29	29	29
Financial specialists	42	44	17	13	13	14	14	14
Computer occupations	46	49	21	17	17	18	18	18
Mathematical science occupations	1	1	1	1	1	1	1	1
Architects, surveyors, and cartographers	6	6	1	1	1	1	1	1
Engineers	32	35	21	19	18	18	18	18
Drafters, engineering technicians, and mapping technicians	18	20	12	10	10	10	9	9
Life scientists	4	4	2	1	1	1	1	1
Physical scientists	5	6	2	2	2	2	2	2
Social scientists and related workers	5	5	2	2	2	2	2	2
Life, physical, and social science technicians	5	6	3	3	3	3	3	3
Counselors and Social workers	21	24	10	9	10	10	10	11
Miscellaneous community and social service specialists	17	19	8	7	8	8	8	8
Religious workers	2	3	1	1	1	1	1	2
Lawyers, judges, and related workers	18	18	6	5	5	5	5	5
Legal support workers	8	8	3	2	2	2	2	2
Postsecondary teachers	1	3	2	1	1	1	1	1
Preschool, primary, secondary, and special education school teachers	4	8	6	3	3	4	4	4
Other teachers and instructors	3	4	2	1	2	2	2	2
Librarians, curators, and archivists	8	8	3	3	3	3	3	3
Other education, training, and library occupations	4	5	3	2	2	2	2	2
Art and design workers	8	8	3	2	2	2	2	2
Entertainers and performers, sports and related workers	5	5	3	2	2	2	2	2
Media and communication workers	6	7	2	2	2	2	2	2
Media and communication equipment workers	2	3	1	1	1	1	1	1
Health diagnosing and treating practitioners	41	45	22	20	23	26	28	29
Health technologists and technicians	35	38	17	15	17	19	20	21
Other healthcare practitioners and technical occupations	3	3	3	2	2	2	2	2
Nursing, psychiatric, and home health aides	22	25	14	15	18	21	23	25
Occupational therapy and physical therapist assistants and aides	1	2	1	1	1	1	1	1
Other healthcare support occupations	16	17	8	6	7	8	9	9
Supervisors of protective service workers	13	14	6	5	5	5	5	4
Fire fighting and prevention workers	20	22	9	8	8	8	8	7
Law enforcement workers	79	85	34	30	30	29	28	27
Other protective service workers	30	33	18	15	15	16	15	15
Supervisors of food preparation and serving workers	8	9	6	5	5	5	5	5
Cooks and food preparation workers	25	29	18	17	17	17	16	15
Food and beverage serving workers	51	61	39	39	39	39	37	35
Other food preparation and serving related workers	10	12	8	8	8	7	7	6
Supervisors of building and grounds cleaning and maintenance workers	5	5	3	2	2	2	2	2
Building cleaning and pest control workers	43	47	26	20	20	21	21	21
Grounds maintenance workers	24	26	12	10	11	11	11	11
Supervisors of personal care and service workers	3	3	1	1	1	1	1	1
Animal care and service workers	3	3	1	1	1	1	1	1
Entertainment attendants and related workers	9	10	4	4	4	4	4	4
Funeral service workers	1	1	1	0	0	0	0	0
Personal appearance workers	9	9	5	3	3	3	3	3
Baggage porters, bellhops, and concierges; Tour and travel guides	1	1	0	0	0	0	0	0
Other personal care and service workers	20	22	10	10	11	12	13	15
Supervisors of sales workers	30	32	13	10	9	9	9	8
Retail sales workers	177	189	66	51	46	45	42	40
Sales representatives, services	22	23	6	4	4	4	5	5
Sales representatives, wholesale and manufacturing	41	47	32	28	26	26	26	26
Other sales and related workers	21	22	8	5	5	5	6	6
Supervisors of office and administrative support workers	30	32	13	10	10	10	10	10
Communications equipment operators	2	2	1	1	1	1	0	0

Financial clerks	87	93	32	25	24	25	25	25
Information and record clerks	90	97	45	37	36	37	38	38
Material recording, scheduling, dispatching, and distributing workers	68	75	42	35	32	31	30	28
Secretaries and administrative assistants	108	115	35	26	25	26	26	26
Other office and administrative support workers	113	121	41	32	31	31	31	31
Supervisors of farming, fishing, and forestry workers	0	0	0	0	0	0	0	0
Agricultural workers	2	3	1	1	1	1	1	1
Fishing and hunting workers	0	0	0	0	0	0	0	0
Forest, conservation, and logging workers	1	1	0	0	0	0	0	0
Supervisors of construction and extraction workers	121	126	15	8	7	6	6	7
Construction trades workers	982	1025	124	68	56	55	55	58
Helpers, construction trades	79	83	9	5	4	4	4	4
Other construction and related workers	38	40	10	8	7	7	7	7
Extraction workers	6	6	1	0	0	0	0	0
Supervisors of installation, maintenance, and repair workers	20	22	11	9	9	9	9	9
Electrical and electronic equipment mechanics, installers, and repairers	25	27	8	6	6	5	5	5
Vehicle and mobile equipment mechanics, installers, and repairers	47	51	20	17	16	16	16	16
Other installation, maintenance, and repair occupations	154	171	82	71	68	68	68	68
Supervisors of production workers	8	12	28	27	26	26	25	25
Assemblers and fabricators	19	22	22	19	18	17	17	17
Food processing workers	5	6	2	1	1	1	1	1
Metal workers and plastic workers	31	66	215	215	215	216	217	218
Printing workers	2	2	1	1	1	1	1	0
Textile, apparel, and furnishings workers	6	6	3	2	2	2	2	2
Woodworkers	8	8	1	0	0	0	0	0
Plant and system operators	8	9	6	6	5	5	5	5
Other production occupations	28	40	75	71	70	69	69	69
Supervisors of transportation and material moving workers	7	8	6	5	5	5	5	5
Air transportation workers	0	0	0	0	0	0	0	0
Motor vehicle operators	79	85	33	26	25	25	25	25
Rail transportation workers	1	1	1	1	1	1	1	1
Water transportation workers	1	1	0	0	0	0	0	0
Other transportation workers	7	7	3	3	3	3	3	2
Material moving workers	88	101	78	67	65	64	63	62

FISCAL IMPACT ANALYSIS

The economic story is positive for Big River; however, the fiscal impact picture is much more mixed. The large investments and operations do generate jobs, but the size of some of the incentives erodes much of the tax revenue presented to the state in the form of increased economic activity, payroll, taxable income, and business sales. We have chosen to represent the fiscal impact in two ways: one way without the cost of the incentives and bond repayments included (to show the pure "upside" of the project while still having the secular increase in the carrying cost to the state of a larger population) and one with them included. This should allow the Bureau of Legislative Research to consider the expected benefit of the project in fiscal terms, and then the expected cost when taking out the cost of the bond repayments and the lost revenue from incentives.

REMI does not and will not recommend for the approval of Big River or any incentives behind its location decision. Instead, the consideration for the state is the expected benefits (in the form of jobs, GDP, and some additional revenues) versus the cost (of the opportunity cost of incentives, higher carrying costs to the state budget, and fiscal offsets in future years). Any offset, which we did not include in this section, would have an adverse effect on the benefits of the project, too. This project only throws the state budget out of balance in any given year at the worst, however, so it would not have a tremendous influence on the total economic impact. Some higher taxes or reductions in spending to the tune of a few million dollars would have a relative diminutive effect on jobs and a commensurately small impact on GDP and income. It is up to the state to determine if the positive economic impact is worth some of the fiscal downsides of the project given uncertainties about the firm's viability as a private enterprise and how exactly it will claim credits.

Upside of the project without incentives

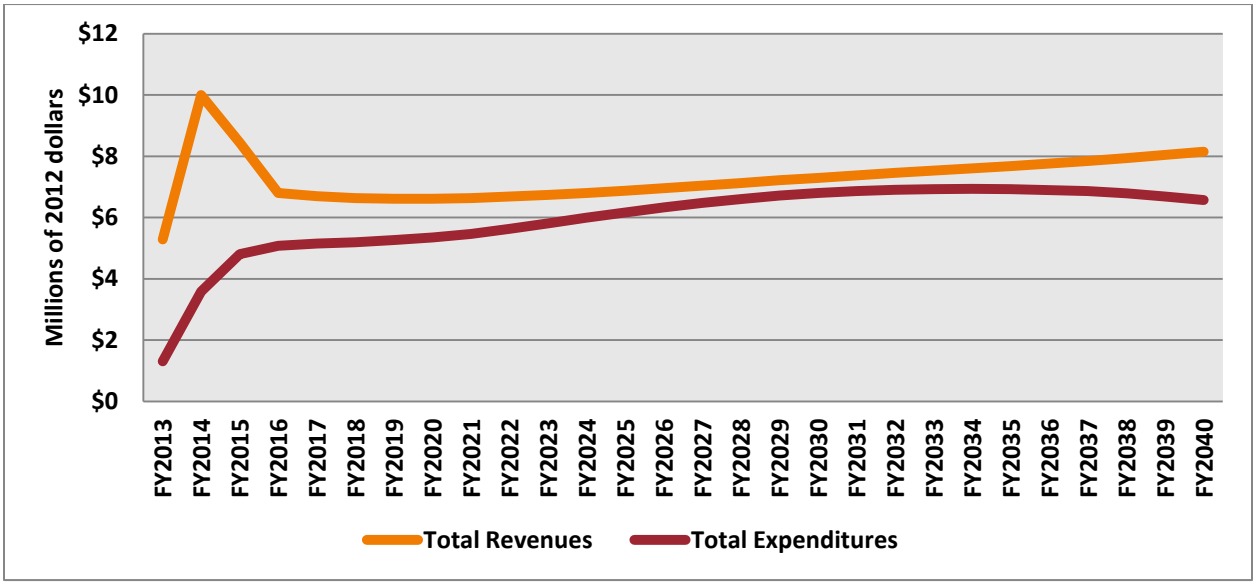

Figure 11 – This chart shows the fiscal impact of Big River in the Tax-PI budget module. The initial boom in business activity leads to more payroll, consumer spending, and has an obvious position impact on state revenues. Over time, on the other hand, increased population means much of the additional revenues must go to "mundane" carrying expenses for things like education, police and social protection, and healthcare.

Upside of the project without incentives, rolling

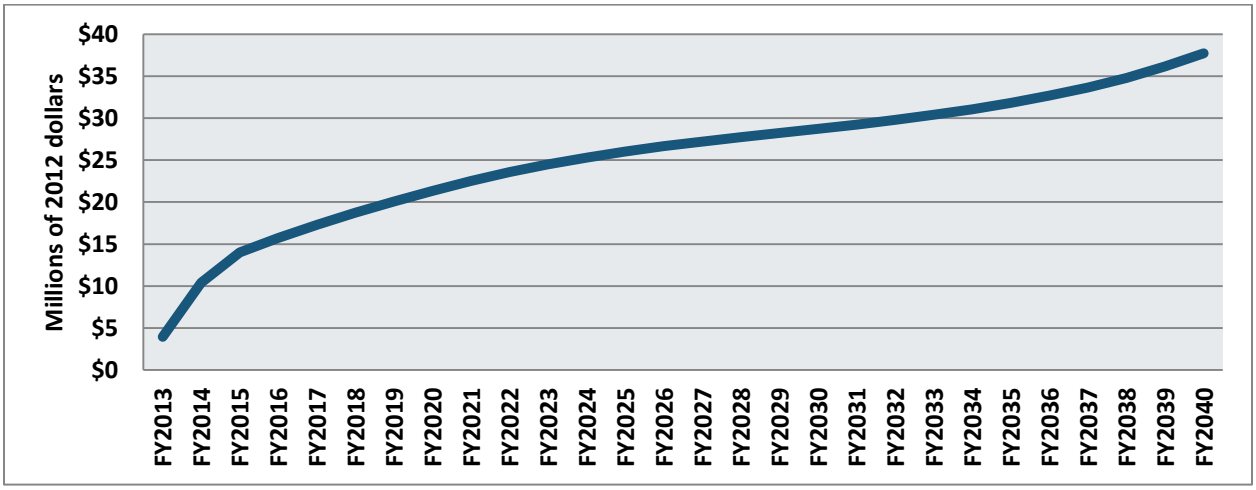

Figure 12 – This shows the sum of the fiscal impact to the state budget summed over the years. For example, in FY2030, the total sum of surpluses generated by the plant alone approaches $30 million. This is the sum of the annual differences between the orange and red from Figure 11 added from year-to-year to give a total impression of the upsides of the project before counting the additional opportunity cost of the incentives and payback.

Including the Incentives and Payback, no Recycling Credit

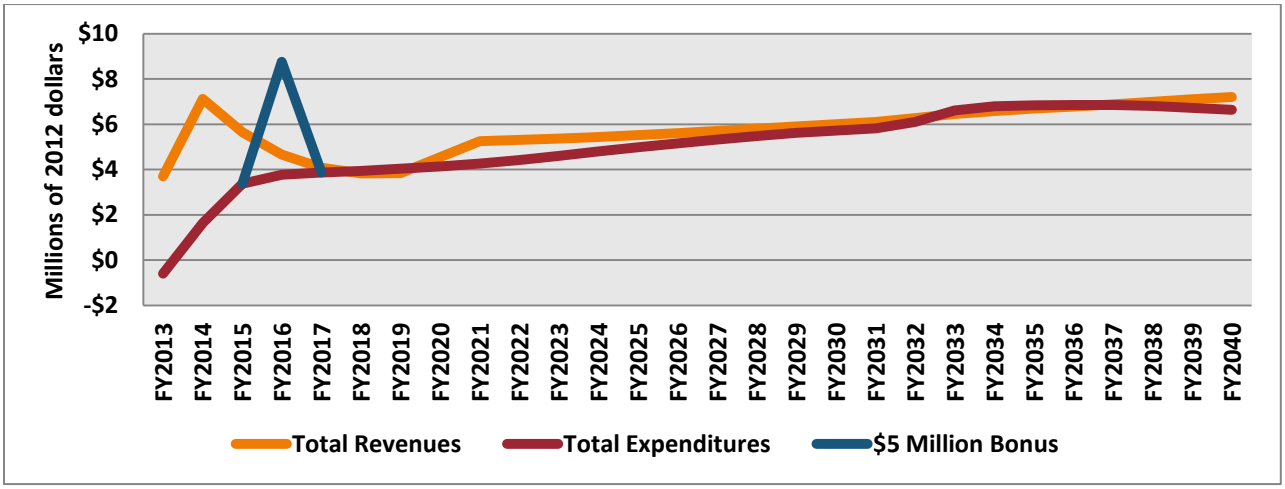

Figure 13 – This shows the fiscal impact of the steel project. This particular graph accounts for tax revenue, foregone revenue from the incentives program (taking an expansive definition of an incentive as anything Tax-PI might otherwise pickup, regardless of its status as statute under state law or specific incentive for Big River). The fiscal impact is generally positive in the short-term, though the $5 million bonus and long-term carrying costs leave the budgetary picture relatively mixed before accounting for the potential recycling credit.

Including the Incentives and Payback, Recycling Credit

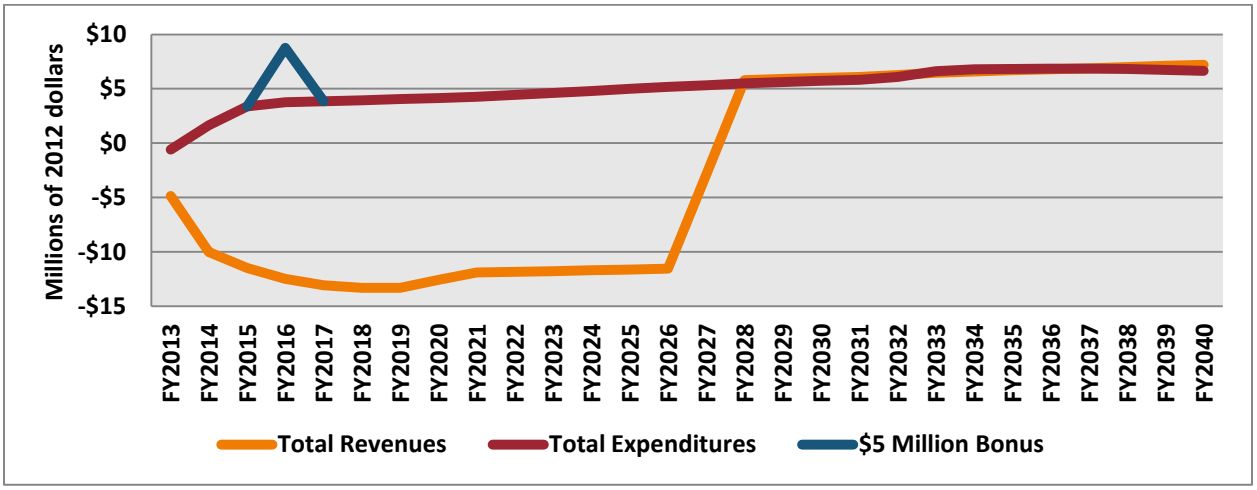

Figure 14 – This shows the same graph with the Delta Trust estimate of the opportunity cost of the recycling tax credit. Tax Credits are complicated from a budgetary perspective; they are not a "true" cost in the sense they increase outlays, but they can reduce the net tax burden of a firm if the enterprise can and does claim them. Given this tax credit is a potential reduction in the amount of tax owed by Big River from using recycling equipment, we deducted it from the level of anticipated revenues. This would represent the biggest potential change in the state budget from how Big River impacts Arkansas and its fiscal condition.

INCLUDING THE INCENTIVES AND PAYBACK, NO RECYCLING CREDIT, ROLLING

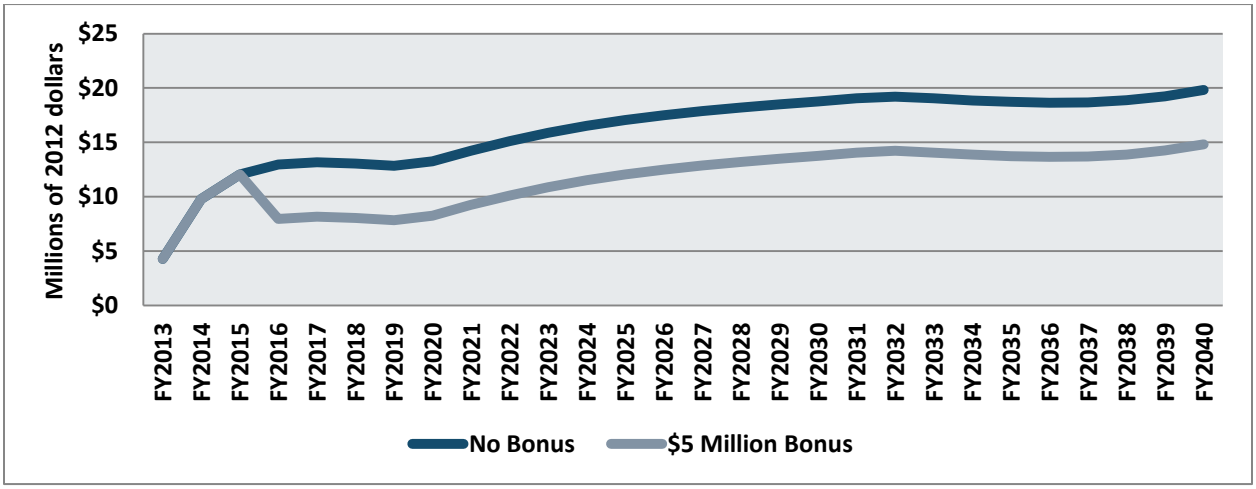

FIGURE 15 – THIS SHOWS THE ROLLING COST TO THE STATE WITH THE INCLUSION OF THE INCENTIVES. THE $5 MILLION DOLLAR BONUS IS INCLUDED IN THE LOWER OF THE TWO LINES IN LIGHT BLUE. WITHOUT INCENTIVES, THE STATE STANDS TO GAIN AROUND $40 MILLION IN NET REVENUE OVER THE LENGTH OF THE ANALYSIS, BUT THE INCENTIVES (WITH SOME FEEDBACKS) REDUCE POTENTIAL STATE REVENUE GAINS BY SOMEWHERE AMID $20 MILLION AND $25 MILLION OVER THE TIMEFRAME. THIS IS STILL A POSITIVE, BUT IT DEPENDS ON HOW ONE WEIGHS THE OPPORTUNITY COST OF RECYCLING TAX CREDIT.

INCLUDING THE INCENTIVES AND PAYBACK, RECYCLING CREDIT, ROLLING

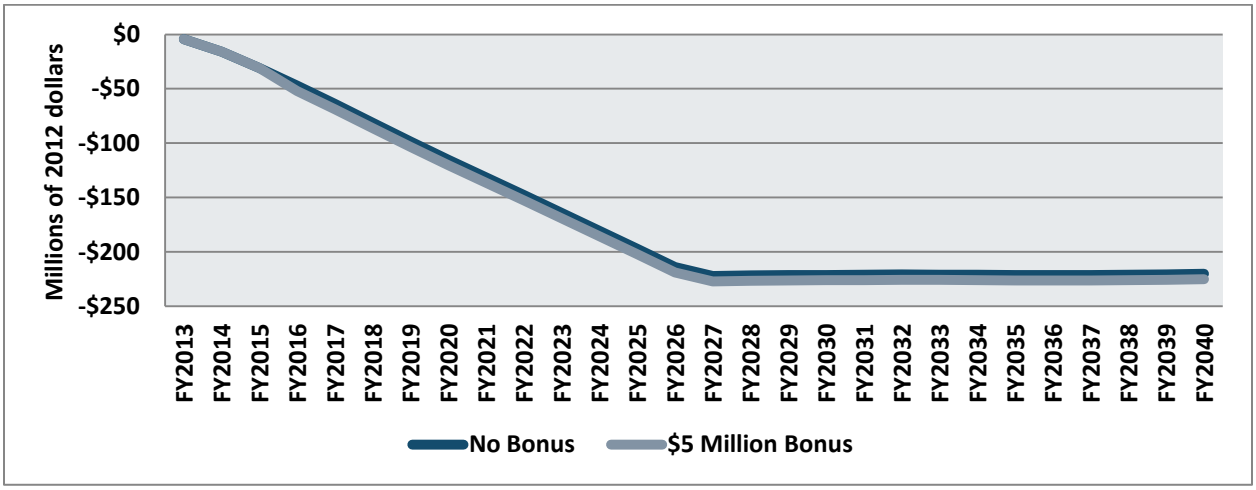

FIGURE 16 – WHEN COUNTING THE OPPORTUNITY COST A FULLY-CLAIMED TAX CREDIT AGAINST THE BUDGET, THE FISCAL IMPACT REVERSES ITSELF ROUGHLY $240 MILLION. THIS CORRESPONDS TO THE STATIC ESTIMATE OF THE SIZE OF THE CREDIT FROM EXTERNAL SOURCES. THIS IS NOT A COST IN THE TRADITIONAL SENSE, BUT A TYPE OF FOREGONE REVENUE, WHICH IS STILL A NET LIABILITY AGAINST THE BUDGET IF IT IS CLAIMED. WHILE THIS IS A BURDEN ON THE STATE BUDGET, THIS DOES NOT NECESSARILY MAKE THE IMPACT OF BIG RIVER NEGATIVE IN THE ECONOMIC SENSE, AS A NET LOSS OF $225 MILLION OR SO OVER THIRTY YEARS HAS A LONG WAY TO GO TO CONTEND WITH BILLIONS OF ADDITIONAL TOTAL GDP OVER THE SAME PERIOD.

Dynamic Feedback

This turns the discussion to using the Tax-PI to model if the offsets above are worth the economic benefits of Big River. The state has two means of balancing the budget in the face of the fiscal offsets in Figures 15 and 16, which would involve either changes taxes or spending against a baseline. There are an infinite number of options about how exactly to do this when allocating between taxes or spending, and there are a similarly large number of options about which sorts of taxes and spending to modify. Tax-PI allows the user to look at specific cases regarding future legislative actions and priorities, such as exempting K-12 education spending from cuts or concentrating on changing the general sales tax to bring balance. We have no way to anticipate these individualities, and it would be up to local analysts to make these assumptions about the future of the budget with knowledge of the state's history, politics, and priorities. Therefore, we shall make the "least exotic" assumption in showing the net impact of the anticipated fiscal offsets.

To do this, we assumed the state kept a balanced budget by either decreasing or increase state government spending "across the board." This is the most likely scenario given the nature of budget planning—it is easier for government agencies to reprioritize their annual budgets on the margin than to change the tax code, which requires exogenous or extensive legislative action. In some years, the state will cut its own spending to make up the annual hole in the budget from Figure 16. In other years, the state will be able to expand slightly its spending because of the fiscal benefit of the project in an individual fiscal year. **One should consider this analysis a compliment to the impact analysis in the previous section to adjust for a projected need for a fiscal offset to supplement the project and its incentives.** Given that we had to make an outside assumption about using spending to balance the budget, the section above is still the impact of the project alone, but these results should give some idea if the costs are worth the benefits in economic terms.

Example Offset (Total Employment)

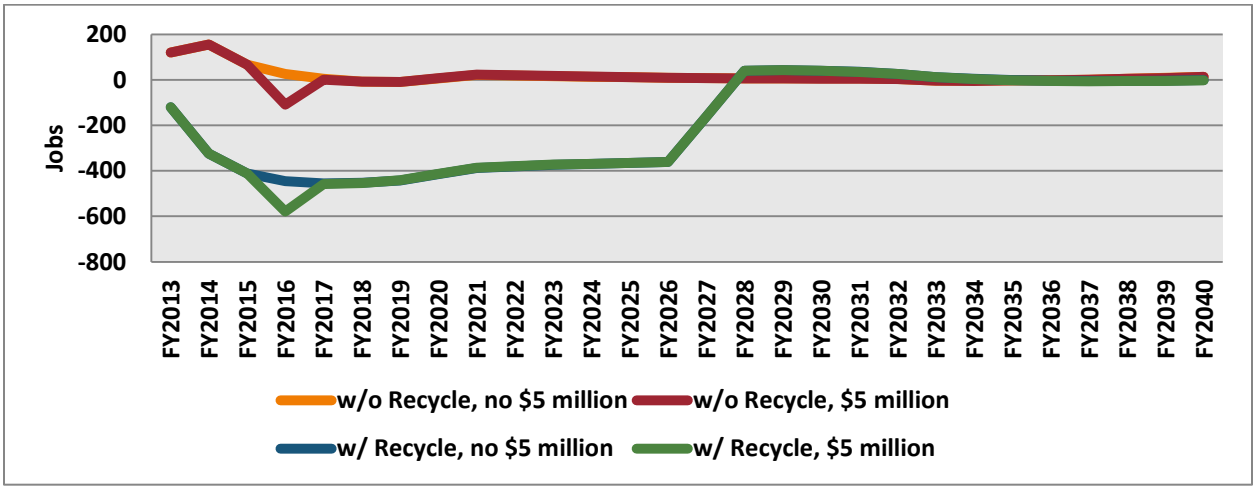

Figure 17 – This shows the potential employment impacts of balancing the budget on the spending side of the ledger. Depending on the required offset, the state could rebalance itself while gaining a small number of jobs, having little change, or losing around 500 to 600 jobs in a given year for a short period. Remembering that the benefits of the project approach 1,300 jobs in the out years, the fiscal impact would only modify—but not change—the positive economic impact story of Big River from the previous pages.

Fiscal Benefit-Cost Analysis

Scenario	3% discount	7% discount
w/o Recycle, no $5 million	1.1925	1.2795
w/o Recycle, $5 million	1.1347	1.1899
w/ Recycle, no $5 million	n/a (-)	n/a (-)
w/ Recycle, $5 million	n/a (-)	n/a (-)

Table 6 – This is a strictly fiscal benefit-cost of the project under the scenarios. Without the opportunity cost of the recycling credit, the benefit of the project and its incentive is more than one even when applying a discount to the figures. On the other hand, the $240 million behind the recycling tax credit produces a ratio less than zero due to the a "negative benefit" on the revenue side of the ledger from the previous figures. This is an absurd result from the standpoint of benefit-cost analysis, so we did not include it here.

Economic "Return on Investment"

w/ Recycle, $5 million	2013	2014	2015	2020	2025	2030	2035	2040
Total Employment	3,601	3,914	1,599	1,332	1,301	1,312	1,311	1,312
GDP	$411	$441	$168	$154	$159	$166	$172	$177
State Fiscal Offset	-$4.287	-$11.648	-$14.863	-$16.734	-$16.607	$0.275	-$0.142	$0.576
Dollars per Job	$1,190	$2,976	$9,295	$12,563	$12,765	n/a	n/a	$439
$ GDP for $ Offset	$95.87	$37.86	$11.30	$9.20	$9.57	n/a	n/a	$307.29

Table 7 – This shows one way to look at the project and its incentives in terms of a return on investment to the state budget in terms of jobs and GDP compared to fiscal offset. The state has a cost in this worst-case scenario of the full opportunity cost of the recycling tax credit for fourteen years and the $5 million in bonus paid to the firm. The state still has a return to the outside capital investment and production in the state, however. This shows the most the state pays is approximately $12,500 per year in the worst years, and the worst "ratio" of GDP return for state cost is about $9.25 of GDP for each dollar in state cost. The most crucial of the analysis years are in red. Total employment is the number of jobs, GDP is in millions of 2012 dollars, the state fiscal offset is in millions of 2012 dollars, the dollars per jobs in units of 2012 dollars, and so is the dollars GDP for dollars offset row.

AUTHORS' BIOGRAPHIES

Scott Nystrom holds a B.A., B.S., and M.A. from Iowa State University in Ames, IA. He has worked at REMI since 2011, and he is the lead analyst and consultant for its Washington, DC office. Previous experience in analyzing the fiscal effects of state policies include those of tax credit programs in Missouri, incentive programs in Iowa, and the economic and fiscal impact of Medicaid expansion on the North Carolina economy and budget. Prior to REMI, he worked as a lecturer and teaching assistant and Iowa State.

Scott Nystrom, M.A.
<Scott.Nystrom@remi.com>
(202) 716-1397

Elías Scheker Da Silva holds a B.S. from Michigan State in East Lansing, MI in economics (concentrating on international finance and trade). He has been an assistant economist and research associate with REMI since 2012. He specializes in impact analysis, economic modeling, sub-national forecasting, base analysis, and local development. He also works on Latin American and European contacts. He has previous professional experience in international trade, diplomacy, and non-profit management.

Elías Scheker Da Silva
<Elias.Scheker@remi.com>
(202) 499-1040