Economic Impact of Retail Electric Competition in Alabama

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Executive Summary

A comprehensive analysis of the economic impact of retail electric competition in Alabama indicates that electricity prices will rise 6%, consumer surplus will fall, and gross state product will decline. This analysis is the outcome of a joint study by Professors of Economics at Auburn University and the University of Alabama. The study concludes that Alabama should not rush headlong into retail competition because the state has low electricity prices.

Restructuring will raise the price of electricity for most Alabama consumers as retail competition in higher priced states increases demand for Alabama electricity. Higher prices will raise revenue for electricity producers, but at the expense of lower consumer surplus and reduced output in Alabama. Consumers in high priced states are pushing for retail competition, but there is a definite first mover disadvantage for early adoption of retail competition by low price states.

For Alabama, there is also value in learning from the experience and mistakes of other states regarding workable market structures and efficient engineering systems consistent with retail competition. The state is best served by delaying retail competition for the foreseeable future.

There are various possible scenarios for restructuring the electricity industry. The four stages of electricity production and delivery are generation, transmission, distribution, and retail sales. Conventional wisdom is that free entry and competition in transmission and distribution

would be inefficient because of duplication of wires. These two stages of the industry will remain regulated monopolies. Restructuring plans for the electricity industry focus on making generation and retail sales competitive. Generation is already somewhat competitive at the wholesale level. With retail competition, consumers have choice between suppliers.

Competitive retail involves retailers directly competing with each other for individual customers. Distributors would be paid fees based on costs. The analogy is the existing market for long distance telephone service. As states move toward retail competition, some are requiring utilities to divest generation from transmission to avoid conflicts of interest.

The move toward retail competition in the national electricity industry will lead to increased exports from relatively low price states to higher price states. Alabama is a low price state that currently exports about one third of its generation to other states. Importing states in the region are Florida, Mississippi, Louisiana, North Carolina, and Virginia. Alabama is one of the most export-oriented states in the country.

With retail competition in the region, consumers in other states will have direct access to Alabama electricity. This higher export demand will raise the price of electricity in Alabama. Increased exports will be the predominant story in Alabama's electricity industry over the coming years as retail electric competition evolves.

The Energy Information Agency of the Department of Energy projects the average price of electricity in the US will decline as competition evolves over the next 20 years. The average price in the US is predicted to fall to about the level in Alabama. The average in the US is $.069, the projected average price with retail competition is $.055 for the year 2020, and the current average price in Alabama is $.053.

With continued wholesale competition, downward pressure on prices can be expected. Electricity prices will fall with the entry of competition or thee threat of entry into a competitive generation industry. The situation for Alabama is very different from the nation as a whole. The price of electricity in Alabama will rise over the next few years with exports, then begin to fall back toward its existing level.

Coal is the major fuel in Alabama. There is a move toward the use of natural gas, stimulated largely by tightening pollution controls. Nevertheless, coal is likely to remain the dominant fuel for at least another 10 years.

Entry of new generation firms could be difficult for a number of reasons. In restructured states, the existing utilities may be able to set prices to discourage entry. Further, environmental restrictions make it easier to refurbish older generation sites rather than to build new ones. Southern Company owns and controls much of the transmission system, making entry more difficult. Transmission bottlenecks put limits on interstate trade and new generation.

Phase II Clean Air regulations will apparently force generators using coal throughout the eastern US to switch to lower sulfur coal, install scrubbers, or use emission credits. New rules on nitrogen oxide emission will further increase pollution control expenditure by generators. If the commitments for carbon dioxide emissions of the Keyoto environmental summit are implemented, pollution abatement expenditures will rise substantially.

Tightening pollution control requirements will raise the cost of electricity generation. Simultaneously, increased export demand for Alabama electricity will put upward pressure on prices in the state. Some industrial customers may be able to bargain for reduced rates. In fact, low rates for long-term contracts are already being offered to some industrial customers in anticipation of retail competition. Lower industrial prices will put upward pressure on residential prices.

With retail competition, retail sales can be separated from distribution. Retailers could compete for individual customers inside traditional distribution areas. Regulated “wire companies” would sell wire services to competitive retailers. It is likely that there will be less competition for rural customers, implying rural rates will increase relative to urban rates. Studies of Kentucky and Kansas predict higher rural residential rates.

The role of regulation in the evolving regime is unsettled. There are different forces at work, including state regulators, federal regulators, changing environmental laws, uncertain enforcement of environmental regulations, interstate vertically integrated utilities, traditional utilities, independent power producers, co-generators, federal generation, and regional retail competition. These forces are at odds in many respects, and the outcome will be as much political as economic.

Firms that both generate and transmit are now forced to transmit the electricity of their competitors. A regional transmission system will require regional coordination. There are calls for independent system operators and divestiture of transmission from generation, but planning an efficient system will be difficult. The economies of scope that occur between generation and transmission would be lost with divestiture, and costs of each activity will be higher than for an integrated firm. The move to competition might more than make up for these lost economies of scope, but at this point that is only speculation.

The Alabama Econometric Model (AEM) projects the effects of changes in electricity prices on the state economy and industrial outputs in the state. Three basic scenarios are examined in the AEM up to the year 2003, namely steady electricity prices, falling prices with continued wholesale competition, and higher prices with retail competition. Projected effects on existing industry are small.

The AEM makes specific predictions about the pattern of industrial adjustment up to 2003. With the modest projected decline of 3% in the price of electricity due to wholesale competition, electricity revenue falls by less than 2%. There is a miniscule increase in state output compared to the base case with a steady price of electricity. Consumers pay lower electricity prices, but their yearly gains average only $19 per person over the five years.

This report projects the average price of electricity in Alabama will rise with retail competition from $.053 to the regional average of $.058, then begin a slow decline to $.056 up to 2003, the price predicted by the Department of Energy. The quantity of electricity demanded would be lower in the state than with a steady price of electricity at $.053.

AEM does not speculate on the evolving pattern of investment with a deregulated electricity industry. Investment is the ultimate driving force behind output. The price of electricity is an important determinant of location for many industries. Traditional electric utilities have worked with state and local government on recruiting industry. Investment patterns with a restructured electricity industry may be different than they would have been. Investment changes due to restructuring will have larger effects on output, but they are difficult to forecast.

With retail competition between now and 2003, electricity revenue is projected by AEM to increase slightly, by about 2%. Consumers suffer with the higher price of electricity, their losses in consumer surplus averaging $77 per capita over the five years. Output declines across all industries due to the higher price of electricity. The industries suffering the largest declines in revenue with retail competition compared to continued wholesale competition are

Miscellaneous Durable Goods	*-4.5%*
Textile Mill Products	*-1.5%*
Furniture & Fixtures	*-1.3%*
Mining	*-1.2%.*

Industries with losses over half of one percent are

Fabricated Metal Products	*-0.8%*
Chemicals & Allied Products	*-0.7%*
Lumber & Wood Products	*-0.7%*
Stone, Clay, & Glass Products	*-0.6%.*

Economic Impact of Retail Electric Competition in Alabama

I. Introduction

This is a report on the potential economic impact of retail electric competition in Alabama. There is a move toward retail competition and increased interstate sales in the electricity industry across the US. Alabama is a low cost producer of electricity due to fuel availability, rivers for transport and hydroelectric generation, and historically sound investment in efficient generation facilities by the utilities in the state.

Retail competition would involve increased interstate competition, which will open the regional market and increase the demand for Alabama's cheap electricity. This increased demand will tend to raise the price of electricity in the state. An increase in the average price of electricity in Alabama over the next few years due to increased exports is likely.

Two other important structural changes will have effects on the electricity industry. Tighter Clean Air regulations will raise the cost of generation. Pending Phase II limits on sulfur dioxide and new nitrogen oxide controls will be costly for generators in Alabama, and will raise the price of electricity to consumers

Another type of structural change is the technological improvement in combined cycle gas generation and micro-generators. Fuel cells may have some applications. Improving technology will lower costs. The timing of these structural changes will converge in the near future, and it will be difficult to separate the various effects on the price of electricity.

Our projection is that regional retail competition would increase the average price of electricity in Alabama to the regional average over the next few years as exports from the state increase. Prices will then slowly decline to the forecasted price of the Energy Information Agency, to about the present price in Alabama by the year 2020.

With electricity exports from Alabama, producers in the state receive a higher price but consumers have to pay a higher price. Alabama exports about one third of the electricity generated inside the state, including TVA. These exports will increase as the regional electricity market develops.

The effects of competition on the electricity industry in Alabama will depend largely on the new form of regulation. Alabama has three generation and transmission systems at present: Alabama Power Company (APC) in the central and southern part of the state, the Tennessee Valley Authority (TVA) in northern Alabama, and the Alabama Electric Cooperative (AEC) in the southern part of the state. A crucial issue in the new regulation regime will be how transmission is administered, both in the state and in the region.

The distributors in the state are APC, 23 cooperative utilities, and 36 municipal utilities. The various co-ops and municipals buy electricity generated by APC, TVA, and AEC. The pricing of wire services is based on average costs. The effects of retail competition would depend on how these distribution franchises are affected. There promises to be competition for large industrial customers, and some residential customers may be able to choose their electricity supplier.

With retail competition, consumers have choice between various electricity suppliers. Exactly how this choice will be put into practice is both a legal and engineering issue, and answers may vary across regions and states. Engineering aspects of retail competition will have to evolve. Real time pricing of electricity is technologically possible, but would take time to implement on a wide scale. Economic outcomes will depend mostly on how the regulatory and engineering systems evolve.

A recent study on electricity restructuring in South Carolina examines the effects of retail competition in that state. It predicts increased residential rates in South Carolina due to charges for stranded costs. A study of the electricity market in Kentucky concludes there will be higher prices in Kentucky due to exports. A study on Kansas predicts higher rural electricity prices due to stranded cost payments and the loss of subsidies for rural residential customers. An Indiana study predicts prices would fall due to efficiencies imposed by competition, but increased exports could mean higher prices.

Stranded costs are estimated to be minimal in Alabama, at least outside the TVA fence. Stranded cost arrangements in the TVA area are an issue the US Congress has to face. A stranded cost law has been enacted in Alabama, and customers who change electricity providers could face stranded cost payments. Alabama is a low cost producer of electricity at present, ranked 39th among the states in 1995. Electricity investments in Alabama are productive, and stranded costs should not be a critical issue. Price changes in Alabama over the next few years will depend mostly on the degree of exports from the state.

At present, all residential customers served by a distribution company pay the same rate, regardless of their distance from the substation or the number of customers per mile of line. Regulators may continue this practice in a restructured industry. On the other hand, if distribution charges with restructuring are levied based on costs of service, rural rates will rise relative to rates for urban customers.

Energy intensive industries in Alabama are chemicals, primary metals, paper, and textiles. These large industrial customers may be able to contract for lower electricity rates with retail competition, but increased demand for electricity exports from the state could result in higher rates even for these large industrial buyers. Retail competition will lead to lower industrial rates relative to residential and commercial rates. With intense competition for industrial customers, there will be upward pressure on residential and commercial prices.

Maloney and McCormick (1997) strongly advocate retail competition, projecting immediate nationwide rate decreases of 25% with peak load pricing and smoothing over production cycles. Their assumptions, however, lack connection with the engineering of generation and transmission. Barnett and Thompson (1997) predict smaller price reductions due to retail competition, and point out that the price of electricity will rise in some states.

Kaserman and Mayo (1991) and Kwoka (1996) point to economies of scope between generation and transmission, the central point of Isaacs (1998). Costs of firms that both generate and transmit are lower than costs of firms that only generate. Kwoka predicts lower prices from competition, but understands that the physics and incentive structure must be compatible. Kwoka predicts price reductions of about 5%, but with variation across states and customers.

The present report examines the impact of projected changes in electricity prices in Alabama, under continued wholesale competition and with a move to retail competition. Simulations with the Alabama Econometric Model of the Center for Business and Economic Research of the University of Alabama provide detailed projections. The model examines the impacts of continued wholesale electric competition and retail competition.

II. Review of Federal Legislative History since 1935

A. PUHCA

In the heart of the Great Depression, the Public Utility Holding Company Act (PUHCA) was one of the more pervasive New Deal regulatory programs. PUHCA, and its sister legislation, the Federal Power Act (FPA), were the result of a study by the Federal Trade Commission (FTC) and a Congressional Committee which "uncovered significant abuses" including securities of fictitious value, pyramidal corporate structures, market manipulation, and difficult control of operating companies by state regulatory commissions. Congress believed these widespread abuses affected national interest (Lazarus, 1993).

Under Title I of PUHCA, a holding company was defined as an enterprise that owns 10% or more of the stock in a public utility company. To eliminate the complex and confusing structure of holding companies, Section 11b of PUHCA abolished all holding companies that were more than twice removed from their operating subsidiaries. PUHCA also required the holding companies to report buying or selling activity to the Securities and Exchange Commission (SEC). Between 1938 and 1962, 2,419 electric and gas distribution utilities came under the jurisdiction of the SEC. Of these, 928 were subject to divestiture, and 200 were broken up (SEC, 1962).

The FPA and PUHCA established a regime of electric utility regulation that gave distinct powers to state and federal governments. State regulatory commissions were given authority over intrastate activity, including wholesale and retail rates. Abel (1996) points out that PUHCA gave the state regulatory control over retail electric prices through an adversarial hearing process which revolved around how the "revenue requirement" would be distributed among customers.

Federal economic regulation addresses interstate wholesale transactions and rates for electric power. Federal intervention and regulation is justified by the Commerce Clause of the Constitution, and by the inability of the states to regulate interstate commerce. As conceived by PUHCA, federal regulation supplements state regulation.

B. PURPA

The Public Utilities Regulatory Policy Act (PURPA) was introduced and passed in 1978. PURPA was intended to increase efficiency and provide equitable electric rates. PURPA made several modifications in regulation, including interconnection, planning, co-generation, and small hydroelectric facilities (Abel, 1996). PURPA shifted the price basis for electricity from the seller’s cost to the purchaser’s cost. This is an essential facet of the law, as the shift represents a different view of federal regulation.

Until PURPA, regulators had been concerned with return to cost ratios. PURPA signaled a shift in concern toward the power consumer. PURPA allowed small power producers and co-generators to be certified with FERC as a qualifying facility (QF). A small power producer must meet certain requirements regarding fuel use, fuel efficiency, and reliability (16 U.S.C. 791a-825r). QFs are exempt from regulation under PUHCA and the Federal Power Act.

Under PURPA, the local utility must purchase all power generated by QFs in their service area at avoided cost. State regulators were given the authority to establish a procedure for assigning avoided cost. With PURPA, the federal government opened generation to other participants, and raised questions about the natural monopoly justification for regulation.

As a result of PURPA, issues brought before regulatory commissions shifted emphasis. Instead of focusing almost entirely on the utility's total revenue requirements, the commissions began to look at rate designs. Phillips (1993) believes this shift highlights the underlying conflict between fairness and efficiency. Prior to PURPA, electric utilities developed their own rate structures, usually on the advice of engineers (Lazarus, 1993). Avoided costs were frequently set too high, resulting in more QF power than local utilities could reliably transmit or sell.

Over its first 12 years, PURPA resulted in substantial growth of wholesale transactions due in large part to an increase in independent power producers (IPPs). Many regulators began to see this increase as evidence that electricity generation was not a natural monopoly. Growth in the wholesale market led to calls for regulatory reform.

C. EPAct of 1992

Reform that encouraged IPPs and electric utility diversification passed Congress in the form of the Energy Policy Act of 1992 (EPAct). Title 7 of EPAct established exempt wholesale generators (EWGs) distinct from electric utilities and exempt from FPA and PUHCA. EWGs can be constructed anywhere, including foreign countries. Electricity from these facilities must be sold at wholesale to a utility or other generator.

Both registered and exempt holding companies under PUHCA may own and operate EWGs. Title 7 also includes a provision to ensure transmission of wholesale power. The intent of Title 7 was to increase competition in generation by creating new firms that generate and sell wholesale electricity. State regulators were freed by EPAct to allow utilities to purchase electricity from EWGs at contracted rates or to rely on traditional cost of service regulation. The law also allows for state regulators to require financial information. Phillips (1993) makes the point that this part of the law ensures wholesale contracts will not degrade service reliability, or be too great a financial risk.

D. FERC Orders 888 and 889

In 1995, the FERC issued two Notices of Proposed Rulemaking, Orders 888 and 889, which were designed to promote wholesale competition in bulk power markets. Commission Order 888 orders all public transmission utilities to file open access tariffs that allow third parties transmission service. Order 889 establishes the Open Access Same-time Information System (OASIS), an information service that utilities and their competitors must use to obtain information about the available capacity and prices of transmission.

These two orders lay the groundwork for wholesale competition in electricity. The Commission estimates that the cost savings from these rules will be $4 to over $5 billion per year (FERC, 1995). The orders propose an end to transmission dominance.

III. Other State Studies

A. South Carolina

Clifton, Wilder, and Woodward (1997) present a study of the effect of restructuring on the South Carolina electricity market. They point out that South Carolina is a low cost state and that electricity prices will increase with interstate competition. South Carolina also has high stranded costs, estimated to be $.01 per kWh averaged across all customers. The study does not forecast gains from retail competition, and points out that there are no estimates of the costs of a switch to retail competition.

B. Kentucky

Kentucky has the lowest electricity prices in the region, and one of the lowest in the nation. Effects of restructuring in four rural Kentucky counties, Hancock, Pike, Pulaski, Tripp, are examined by Freshwater, Goet, Samson, Stome, Johansson, and Greer (1997). They conclude that demand for exported electricity will raise the price of electricity in Kentucky, as the state becomes an electricity exporter. With retail competition for industrial and residential customers, there will be upward pressure on rural residential electricity prices.

The study argues that retail competition is unlikely in rural areas. Regulated and subsidized monopolies are predicted to be the only feasible market structure for rural distribution. The study assumes an increase in the price of electricity up to the national average, an increase of $.01 to $.02 per kWh in the four counties. Output, employment, and income in the four counties generally fall, but the estimated effects are all less than 0.1%.

The authors also predict increased pollution due to increased generation and transmission in rural areas of Kentucky where generators are located. Most of the effects of pollution are local, including smog, particulate matter, and waterway degradation. Higher exports will mean higher levels of pollution.

C. Kansas

A study on the rural electricity market in Kansas by Gamble, Aistrup, and Myers (1997) points out that airports, weather service, roads, postal service, telephone, and electric service have historically all been subsidized in Kansas. There are four generation co-ops that sell to about thirty distribution co-ops in Kansas.

This study assumes that the wholesale price of bulk electricity will fall to $.04 per kWh under competition. Estimates in the literature range from $.03 to more than $.05. Higher electricity prices are predicted in rural areas, resulting in a decrease in industrial production and lower income. Electricity prices are projected to increase between 5% and 50% in rural Kansas, depending on assumptions. Winners with competition are predicted to be urban customers in high cost states.

D. Indiana

A study on Indiana by Sparrow, Holland, Gotham, Yu, Sanders, and Stamber (1998) examines pricing under regulation and competition. Bulk electricity prices are projected to decline to $.044 per kWh over the next 10 years. Their model assumes electricity can be transmitted throughout the region.

Indiana does not currently import or export electricity. The study makes the point that some states will experience higher electricity prices as their exports increase. If Indiana has high exports of electricity, the price of electricity is projected to end up $.002 higher than with "business as usual," the existing system of insulated service areas.

IV. The Role of Energy in the Alabama Economy

Energy sources in Alabama include fossil fuels, nuclear energy, and renewable energy including hydroelectric dams. Energy consumption in the US is 85% fossil fuels. Nuclear power and renewable sources each provide about 7% of total generation. Electricity generation increased from 291 to 3,533 million megawatt hours (mWh) between 1949 and 1997. The share of electricity used by residential and commercial customers has also increased since 1949:

Consumption shares	*residential*	*commercial*	*industrial*
1949	*26%*	*18%*	*48%*
1997	*34%*	*29%*	*33%*

Alabama has access to coal and natural gas deposits, and has developed its hydroelectric potential. Alabama has a comparative advantage in electricity production, and relatively low electricity prices. The main industrial users of electricity in Alabama are primary metals, chemicals, paper, and textiles. Alabama exports these relatively energy intensive products.

Table 1 illustrates the importance of industrial electricity in Alabama. In the US, 33% of electricity is consumed by industry, while the figure in Alabama is 46%. Note that Kentucky and Tennessee, other low cost states in the region, also attract industry that uses electricity intensively.

Table 2 shows that industrial revenue is more important for the electric industry in Alabama and the southeast than for US industry as a whole.

A. Resources

Alabama consumes more coal than any other primary energy source. In 1995, the consumption of primary energy in Alabama and the US across the different types of fuel was:

	coal	*oil*	*gas*	*nuclear*	*biofuel*	*hydro*
AL	*37%*	*25%*	*15%*	*10%*	*8%*	*4%*
US	*31%*	*27%*	*20%*	*10%*	*4%*	*4%*

Alabama burns more coal and biofuel than the US as a whole, and less natural gas. Natural gas deposits along the Gulf Coast and tightening Clean Air allowances may create a trend in the state toward natural gas. The industrial sector in Alabama is energy intensive relative to the entire US. Total energy consumption by sector in 1995 was:

Energy consumption	*res & com*	*indust*	*transport*
AL	*26%*	*50%*	*24%*
US	*36%*	*38%*	*27%*

Alabama has about 10% of the recoverable coal resources in the Appalachian Region, and about 2.3% of the US total. Coal production in Alabama was about 5% of the output in Appalachia in 1996, and about 2% of US output. About 94% of the coal produced in Alabama is used in the state, and 84% of that is used for electricity generation. Alabama's coal reserves are about 3/4 on the surface, and about 3/4 of the reserves have high sulfur content (above .84 pounds of sulfur per million Btu’s).

Alabama has proven dry natural gas reserves of about 5,000 billion cubic feet, just over 3% of the US total. Additionally, there are 21,000 bcf offsore from Louisiana, which could be used for electricity generation in Alabama. Gas prices in Alabama are relatively low. The price of gas in 1997 ($2.51) was below prices in Georgia ($3.02), Florida ($2.92), North

Carolina ($2.82), South Carolina ($3.57). Gas is cheaper to the immediate west in Mississippi ($2.34) and Louisiana ($2.42). Prospects for gas generation in Alabama are good.

Fossil fuel prices and fuel inputs in electricity generation in Alabama during 1994 were:

Fossil fuels	*coal*	*gas*	*oil*
$/mBtu	*$1.67*	*$2.34*	*$4.02*
% input	*68%*	*1%*	*0%*

Coal is the cheapest fossil fuel per Btu, and is the most used input. Total energy input was 1010 trillion Btu's. Nuclear fuel was 22% of the total input used in electricity generation, and hydro was the other 10%. Overall efficiency of the electrical system is about 33%, which says that 2/3 of the energy potential of fuels is lost in generation, transmission, and distribution.

B. Energy transportation

Alabama produces 17.5 million short tons of the coal used in Alabama. Shipment of the coal used in Alabama is 45% by railroad, 25% by teamway off the main rails, 15% by river, and 15% by truck. There are gas fields located in southwestern and northwestern Alabama. Gas pipelines feed the major metropolitan areas and industries.

C. Imports and exports of electricity

Table 3 shows that Alabama has been exporting about one third of its generation in recent years. Alabama is a low cost producer of electricity, both in the US and in the southeast, which has low prices relative to other regions. The transmission system of TVA and the Southern Company extend across state borders. These systems are integrated, and electricity flows are planned with little regard for state borders. Regional and national retail competition will increase the demand for cheap Alabama electricity. Transmission systems will constrain interstate sales.

D. Electricity and retail energy consumption

Table 4 summarizes the energy consumption for different types of customers in Alabama. Residential and commercial consumers rely on electricity for more than half of their energy consumption. Gas accounts for about one third of residential and commercial energy consumption. Industry uses more of the primary inputs of coal, oil, and biofuels. Transport is a major energy consumer, using 459 trillion Btu’s, about one quarter of total energy.

E. Electricity and the state economy

Table 5 lists the electric service companies operating in the state, and Table 6 shows the companies and their cities of operation. The cities are only indicative of the area of coverage.

The US economy has had a rising share of electricity in total energy consumption and a decreasing energy use per dollar of output (Schurr, 1990; EIA, 1997). The advantages of electricity, when the primary energy sources have been converted into electricity, far more than offset the thermal and line losses (Rosenburg, 1998). The ease with which different energy sources can be used to generate electricity and the versatility of electricity make the electric power industry central to the future of energy (Pierce, 1996).

In its basic role of providing an essential input to production and consumption, the utility industry provides employment and pays taxes. Tax revenues are important for county and local governments and schools. The industry has also been involved in recruiting industry to the state, contributing to economic development.

The power industry is relatively capital intensive. It contributed a little more than 2% of state product in 1996, but employed only 0.6% of the total W&S workforce. The average annual shares of the gross state product and employment over the past two decades are 2.4% and 0.8%. The industry has contributed a disproportionate share of tax revenues.

Table 7 shows the history of output and employment in the electric industry in Alabama. The shares of output and employment have been steady since 1978. The average share of electricity output in total state output since 1978 is 2.4%, and the average share of employment is 0.8%.

Any policy that lowers industry revenue would have adverse impacts on the electricity industry's contribution to state taxes. Additionally, there will be statewide and economic development effects. These effects depend on the attitude of the industry toward promoting economic development and the specific policy involved.

Electricity producers have been involved in development initiatives that have resulted in the successful recruitment of Mercedes Benz, JVC, and other state industries. Such industrial development also brings in peripheral new businesses and increases employment. Increased industrial activity is a catalyst for immigration and population growth. The tax base rises and school systems receive more funds to improve the quality of education. Impacts of economic development activities spill over beyond the expected direct effects.

Electricity is an important input in key Alabama industries. Primary metals, chemicals, paper, and textiles are all heavy users of electricity.

Expenditures on electricity and the shares of electricity in the total costs of these industries in 1991 were:

Industry	*electricity bill*	*share of total cost*
primary metals	*$112 million*	*7%*
chemicals	*103 million*	*5%*
paper	*91 million*	*3%*
textiles	*75 million*	*5%*

Reliable electricity service is important in many industries and businesses that may not use a great deal of electricity. The shares of cost are not complete indicators of the importance of electricity to industry. The key test would be how much industry would be willing to pay for uninterrupted reliable electric service.

Higher electricity prices due to exporting will raise the average price of electricity, but heavy industrial users of electricity may be able to bargain for reduced rates. It seems likely that there will be greater dispersion of prices across industrial customers, with more flexibility in pricing.

V. The Structure of the Electric Utility Industry in Alabama

The electricity industry can be separated into generation, transmission, distribution, and retail. Generation involves turning fuels into electricity. Transmission sends electricity at high voltages across long distances. Distribution provides wire services at lower voltages to individual customers. Retail services provide direct sales to individual customers.

A. Generation

Output shares in kWh in Alabama during 1997 were:

	APC	*TVA*	*AEC*
generation shares	*63%*	*33%*	*3%*

The largest generator is APC, which generates almost 2/3 of the electricity produced in Alabama. TVA accounts for about half as much of the generation in Alabama as APC, and AEC is a relatively small generator.

There is good reason to believe that APC will remain the largest generator in the state. TVA is suffering with unproductive nuclear generators, and the federal government may have to get out of the increasingly competitive electricity business. APC should have minimal stranded costs, and is rated sound financially. Merchant generators may build new facilities in Alabama, but APC is positioned to remain the largest generating utility.

The DOE suggests that refurbishing old generators will have an advantage over building new sites because of the environmental and regulatory difficulties associated with new sites. Upgrading an existing site will be much easier than building a new site from scratch, and APC owns many of the existing sites.

The price of electricity is low in Alabama relative to other states in the region. Alabama may expand its system to export electricity, and APC will be in position to lead any expansion. APC controls the largest part of the transmission system. In competition, APC will be able to price its electricity and design its transmission to discourage investment in generation by merchant generators.

APC could limit entry by charging a price that would discourage other firms from entering generation. Co-generation by industry is profitable at the regulated price, but with retail competition APC may be able to set prices to limit the loss of market share to co-generation. Controlling hydroelectric generation in the state also helps diversify the generation capacity of APC.

There will be incentive to build new generation in states with high prices, subject to fuel availability and other constraints. The alternative is to increase generation in the low cost states and to rely on interstate transmission. The issue of where to build new generation will be based on geography, economics, and politics. Either fuel or electricity has to be shipped to where electricity is expensive. New England is so remote that neither electricity nor fuels can be shipped easily, but with investment in transmission and retail competition electricity prices would fall in that region.

Electricity prices in the southeast are projected by the EIA to converge with increased competition. The southeast provides relatively easy arbitrage of electricity and fuel. Politics will enter the mix as state regulators make decisions affecting generation and interstate transmission. As an example, generation involves pollution, and Virginia for one may want to continue to import its electricity and let other states suffer the local pollution.

B. Transmission

Power is shipped into and out of Alabama through transmission lines owned by APC, TVA, and AEC. The subsequent distribution involves APC, co-operatives, and municipals. APC, TVA, and AEC all transmit to co-ops and municipals.

Table 8 shows the distribution of electricity customers in Alabama. APC has a majority of the customers, while the municipals serve more small industrial accounts. This data comes from publicly available data, and is subject to the account classifications of individual utilities. In the lower half of Table 8, note that APC distributes a majority of the electricity to every class of customer. APC has larger commercial and industrial customers on average than the co-ops or the municipals. The co-ops have a few large industrial customers. TVA has 12 industrial customers, which on average are very large.

C. Size and distribution areas of the state electric utilities

Table 9 provides more detail on the distribution system. APC is the predominant firm for each type of customer, with more than twice as much distribution for every group of customers as any other company. The TVA fence includes most of Alabama north of Birmingham. AEC transmits in the southern third of Alabama. APC controls the rest of the state.

D. Distribution costs of APC and the co-ops

Nationwide, distribution costs are 19% of the price of delivered electricity. Generation costs are the largest share, 74%. If restructuring is to have much effect, there will have to be price reductions at the generator. Distribution systems will almost certainly remain franchised because only one set of lines is desired. Competing distribution lines could be run, but the environmental and other external costs of additional electricity lines seem prohibitive. The distribution system will likely remain a regulated monopoly.

Distribution costs depend on customer density. APC distributes electricity to denser areas than the co-operatives. The co-ops have about half as many miles of line and about one third as many customers per mile of line:

Density	*APC*	*Co-ops*
miles of distribution line	*60,700*	*34,500*
customers per mile	*20.6*	*6.9*

The co-ops sell about twice as high a percentage of their electricity to residential customers and about half as high a percentage to industrial and commercial customers:

Customer Distribution	*APC*	*Co-ops*
residential	*32%*	*63%*
commercial	*24%*	*13%*
industrial	*44%*	*22%*

Revenues from the different types of consumers reflect a heavier concentration of residential customers for the co-ops:

Revenue Distribution	*APC*	*Co-ops*
residential revenue	*41%*	*74%*
commercial revenue	*28%*	*15%*
industrial revenue	*31%*	*11%*

The fact that the co-ops have fewer customers per mile of line contributes to the higher prices charged for residential customers. The co-ops charge about 7% more than APC for residential service.

Prices for commercial customers are about equal, and the co-ops charge 21% less to their industrial customers:

Elecrticity Prices	*APC*	*Co-ops*
residential	*$.068*	*$.073*
commercial	*$.070*	*$.071*
industrial	*$.038*	*$.030*

The relationship between meters per mile of line and distribution costs per meter is negative, with a correlation of -.16. With fewer meters per mile of line, distribution costs per meter are higher. The higher residential price for the co-ops is evidence of the higher costs for rural residential service.

The pricing schemes of APC and the co-ops differ, and the reported price difference may not be exactly proportional to the difference in costs. Prices charged for commercial customers are almost identical, which likely occurs because commercial customers are located in towns close to distribution sources. To the extent that the regulation and pricing schemes are similar for commercial and residential customers, the costs of supplying the typical co-op residential customer is about 50% higher than the cost of supplying the typical APC residential customer. Distribution costs per kWh are reported to be $.024 for APC and $.043 for the co-ops.

Other evidence points to the higher costs of rural residential distribution. To generate $100,000 of sales, the co-ops have to run about two and a half times as many miles of distribution line as APC:

	APC	*CO-OPS*
miles per $100,000 sales	*5.0*	*12.9*

Another piece of evidence of cost differences is that distribution investment per kWh for the co-ops is almost 30% higher than for APC:

	APC	*CO-OPS*
Investment per mWh	*$.100*	*$.128*

Higher prices paid by co-op customers are due in part to this higher investment cost. Maintenance expenses per customer would also be higher for rural areas. As a final piece of evidence, distribution costs take up a higher percentage of revenue for the co-op companies, 67% versus only 44% for APC. Retail competition will put upward pressure on residential rates, and rural customers will continue paying higher distribution charges.

VI. The Impact of Continued Wholesale Electric Competition

Wholesale competition occurs in the market for bulk electricity. With wholesale competition, any generator has access to transmission at rates accessible to all generators.

A. Wholesale competition

Generators can have their electricity wheeled over transmission lines owned by other companies, an awkward situation for a utility having to transmit electricity for a competitor. Many analysts favor either an independent system operator (ISO) or a transmission company (Transco). Both the ISO and the Transco would be independent operators of the transmission system. The difference is that the ISO would be run as a nonprofit coordinator of transmission, while a Transco would operate for profit.

A crucial issue is facilitation of long term planning and construction of the transmission system. If there are conflicts of interest, transmission can be designed to favor particular generators. Regulators must oversee transmission system design. Beyond the state level, FERC has called for regional transmission organizations.

There is generally little consideration of the physical properties of the transmission system in economic analysis. There are physical and transmission limitations on idealized wholesale competition. For instance, the price of electricity in New England or West Texas may have little effect on the Alabama electricity market.

There are at least two models for wholesale competition in electricity. One is the pool company (Poolco) with suppliers putting electricity into a pool and buyers taking it out. Another plan is to allow bilateral contracts, with buyers contracting directly with generators. Difficulties in coordination of transmission systems, however, seem to put limits on bilateral contracts. Contracts might become quick and flexible enough to allow a free contracting system to function.

The present transmission and distribution system has enough redundancy that customers are annoyed by the shortest interruption in service. With bilateral contracts, there is little assurance that the electric system would operate so smoothly. Given the complexities of transmission and dispatch, as well as the lack of experience with competitive electricity markets, there is considerable uncertainty about how well a regional transmission organization or system of bilateral contracts would perform. Delaying restructuring in Alabama until other states have tested alternative arrangements could prevent Alabama from the cost and inconvenience of trial and error.

B. Economies of scale and scope

Investor owned utilities have traditionally been vertically integrated. Jurewitz (1984) notes reasons to vertically integrate:

- increased reliability of diverse generators
- centralized control regulates system frequency and stability
- continuous matching of resource output to customer loads
- efficient dispatch of generators
- coordinated unit commitment and maintenance scheduling
- adequate spinning reserves
- response to emergencies
- reliable, diversified, and least cost resource mix
- coordinated generation and transmission investment.

There is considerable empirical evidence that the electricity industry is subject to scale and scope economies, as in Kaserman and Mayo (1991) and Kwoka (1998). Scale economies occur when average cost per kWh decreases as output increases. Scope economies occur when a vertically integrated firm can generate, transmit, or distribute electricity at lower cost than stand alone firms.

The presence of economies of scope may be no surprise because an electricity system has to be planned and coordinated. Firms that both generate and transmit have lower costs than firms that only generate. Vertical integration reduces costs, but failure to divest is anti-competitive. This is one of several dilemmas that complicate restructuring plans.

Most proposals for state restructuring involve divestiture. Divestiture mitigates vertical market power arising from the conflict of interest in having to design and operate transmission for competing generators.

Divestiture also diminishes horizontal market power in the generation stage of the industry by encouraging entry.

A utility that both generates and transmits can design the transmission system to favor its own generators. Competition would require the design of the transmission system to be neutral in its treatment of generators. It is questionable whether state, regional, or federal regulators have the expertise to ensure effective transmission design. The question of organizational structure for future utilities, specifically whether regulators should eliminate vertical integration, remains unanswered.

If restructuring proposals expand market areas, utilities may be better able to increase customer diversity and operate at higher load factors. Gilsdorf (1995) points out that higher load factors allow firms to use base load plants more extensively and reduce reliance on peakload capacity. Scale economies in generation increase the potential for cost savings from production smoothing.

The important implication of scale and scope economies is that they greatly complicate the computation of the benefits of restructuring. When economies of scale and scope are present, benefits to consumers from divesting are lower.

C. Predicted price trends

The DOE predicts lower average electricity prices in the US due to increased competition among producers. Price declines are predicted to be about 1% per year for the next 20 to 25 years. One issue is whether utilities are as efficient as they could be. There is perhaps an underlying assumption in the DOE projections that the existing utilities have some “slack” in costs. To the extent that franchised monopolies overstate costs to state regulators, there could be price declines due to retail competition.

Falling fuel costs are cited as a reason for the DOE projection. For a 300-megawatt coal plant, fuel costs are about 80% of operating costs. For the same size gas combined cycle plant, fuel costs are about 93% of operating costs. Coal prices are expected to fall somewhat, and gas prices to rise slowly over the next 20 years. Nevertheless, natural gas is projected to be the fuel of choice for the next generation of generators. Gas generators can be built for about 1/3 of the cost of coal generators. Gas burns cleaner and eliminates many of the pollution problems associated with coal.

In the 1970s the DOE projected rising prices for fossil fuels and encouraged investment in nuclear power. Perhaps the present projections are more on target. When it comes to making tough investment decisions, the experience of the existing utilities will weigh heavily. Competition in generation will increase efficiency.

D. Pricing under regulation and competition

Issues of monopoly power will be important as the deregulated electricity market evolves. In the absence of regulation, monopolistic firms will search for the price that maximizes their profit. Pricing regulations constrain monopolists to sell at a price equal to their reported cost plus a regulated rate of return. Without regulation, a utility that can maintain its market share may be able to increase price and raise profit.

A monopoly searches for the price that maximizes profit. A competitive firm is forced to set its price according at the market level, and entry of competition pushes cost to the point that there is no profit. Regulators have the goal of inducing a monopoly to price like a competitive firm, where price covers operation costs and a normal rate of return.

In principle, an unregulated monopolist will charge a higher price and supply less output than a competitive firm. One goal of regulation is to force monopolists to produce competitive output at a price where revenue just covers cost, including a competitive rate of return.

The threat of entry might keep an unregulated monopolist from pricing much above a competitive price. A contestable market is one in which competing firms could enter the industry. To discourage entry, the monopolist might set price just above the competitive level to discourage potential entrants. This entry limiting pricing keeps the price close to a competitive level.

Potential competitors for existing Alabama electricity providers could come from importers who sell power generated in other states, new firms building generation in Alabama, or other existing Alabama firms. The potential to import from other areas or states would be a constraint, but in Alabama exports will be the rule. In the long run, competing generators could be built, but they take a long time to construct.

E. Impact on economic indicators

Wholesale electricity prices are expected to continue to decline due to competitive entry. Though the nation as a whole may realize net benefits from FERC Orders 888 and 889, impacts will vary across regions and states. As with most policies, there will be winners and losers.

In a study that assumes competition in generation services, the Energy Information Agency (EIA, 1998) predicts less than a 1% yearly decline in the average price of electricity across the US. The study notes, however, that price changes would vary by region, and some regions could see price increases. In the Southeastern Electric Reliability Council (SERC) which includes Alabama, the EIA predicts electricity prices will have a strong tendency to converge as they fall. After 2005, prices are predicted to continue a slight decline as fuel costs are reduced and uneconomic costs are amortized.

The EIA forecasts residential electricity demand will grow by 1.5% annually through 2020. The forecast of annual electricity demand growth rates for commercial and industrial sectors are 1.2% and 1.3%, respectively. The EIA study and others consider the very long run up to 2020, but simulations in the present study are conducted only through 2003. The rationale for this conservative position is the increasing risk of error with longer forecasts, especially for electricity restructuring with its many uncertainties.

F. The Alabama Econometric Model (AEM)

The Alabama Econometric Model (AEM) is a simultaneous equation model with over 250 equations describing the state economy. These equations include both behavioral and stochastic equations, as well as numerous identities. Such simultaneous equations models are powerful tools for regional forecasting and economic impact analyses since they are a compromise between simple economic base models and highly detailed and complex input-output models. AEM is based on sound economic and statistical methodologies, and enables testing of the estimated structural relationships. The simultaneous equation structure captures the interrelationships and feedback among economic variables for a region, including the region's trade.

The AEM is updated quarterly and runs forecasts of the Alabama economy at the two digit SIC level. It provides consistent measures of key economic variables across all sectors of the state economy, including gross state product (GSP), employment, unemployment, wages, personal income, and tax revenue. Consistency is achieved because all the equations in the model are solved simultaneously. Any changes in policy or pertinent key variables feed back into other equations in the model and provide estimates of ripple or indirect effects. The major advantage of simultaneous equation models is the convenience of simulating "what if" scenarios, providing consistent estimates of changes across all sectors of the state economy.

The AEM was developed using time series data on employment, output, wages, income, and salaries in the state. Its output includes real and nominal GSP, employment, wages, personal income and its components, and wage and salary earnings at the specified SIC code levels. The unemployment rate and tax revenues are included. Since the purpose of the present project is to estimate the impact of retail competition in electric services, the utilities sectors is further divided to the three digit level to clearly identify the electric services industries.

Real GSP is defined as the total sum of goods and services produced in the state, and is estimated as a sum of the real output of the various sectors of the state economy. These sectors include manufacturing; mining; agricultural services; forestry and fisheries; construction; finance, insurance, and real estate (FIRE); transportation, communications, and public utilities (TCPU); services; government; farming; and wholesale and retail trade.

The manufacturing sector includes major industries by two digit SIC code. The utilities sector is estimated at both two digit and three digit levels. Real output of manufacturing, utilities, and other sectors are behavioral equations estimated as functions of compatible US and state economic variables, as well as other variables indicating comparative advantage specific to Alabama.

The employment block comprises labor demand by all the sectors and industries included in the real output block of the model. Employment demand depends on output produced by the industry, or demand for the industry's product. The employment equations are estimated as functions of sectoral real output and real wages. For some basic sectors of the economy, services and trade for instance, total state personal income or demographic changes in the region may provide a better fit than total output. In that case, employment is modeled as function of changes in income and demographics in the area. In some cases the employment condition at national levels may provide a better fit for the specific industry.

The state's unemployment rate can be explained by looking at total employment and changes in employment. Additional factors such as changes in labor force and wages are sometimes also included in the unemployment equations. The national unemployment rate is also used when it provides an excellent fit.

Wages for sectors, at both one and two digit levels are estimated by dividing total wage and salary earnings by the sector's wage and salary employment. Regional wages are determined by several factors, including demand for labor, US labor productivity, and prevailing national wage rates within specific industries. While the wage rates in a specific region tend to be highly correlated with state and national wage rates, the rise and fall in the region's wages can sometimes be influenced by the prevailing unemployment rate within that region and the economic structure.

Total personal income is estimated as a sum of wages and salary income, dividends and rent, transfer payments, proprietor income, social security payments, less any adjustments by place of residence. Wage and salary income for each sector is estimated as product of wage rates and employment in each sector. All other income categories are estimated as stochastic equations based on state and national counterparts.

The baseline model specification is based on theoretical considerations. It is unlikely that all the regression coefficient estimates will be statistically significant with correct signs. Major causes could be multicollinearity, measurement or variable errors, and unique economic characteristics. Testing and refinements are carried out to ensure model robustness and fit. Once the baseline estimates and forecasts are produced, any policy changes can then be included in the model to estimate the economic impacts of these policies. For instance, changes in demand for public service can be included in the state and local government sector. When the model is solved, the total effects of these changes on the overall state economy can be estimated by comparing the new estimates with baseline estimates.

The impact study is based to some extent on the assumptions and predictions of the Energy Information Agency (1997, EIA97) and the *Annual Energy Outlook* (1998, AEO98) with state specific adjustments for Alabama. To investigate the impacts of competition on Alabama's economy, a base case with unchanged electricity prices is compared with both continued wholesale competition and retail competition. Sensitivity analyses determine the effects of different demand elasticity estimates and different levels of expected price changes. The AEM is combined with a more detailed MS Excel spreadsheet model of the electricity sector to conduct the analysis.

The AEM is used to provide the base case forecast for the state economy. Electricity demand is assumed to have annual growth rates of 1.3%, 4.0%, 1.8%, and 1.5% for the residential, commercial, industrial, and "other" sectors, respectively. The "other" sector includes lights on streets and highways, sales to public authorities, and sales to railroads. AEO98 uses slightly different growth rates for the first three sectors, 1.5%, 1.2%, and 1.3%. The growth rates used here are based on 1996 and 1997 growth rates for Alabama reported in the *Electrical Power Annual 1997* and *1996* (EIA, 1998).

In the base case, electricity prices are assumed to remain unchanged for each of the demand sectors at 1997 levels. For residential, commercial, industrial, and other sectors, these prices are $.0673, $.0646, $.0377, and $.0756 per kWh.

Table 10 shows the base case electricity demand, prices, and revenues through 2003. In the base case, electricity prices stay at their existing levels through 2003. With stable prices, electricity revenue grows by 2.1% each year.

Tables 11 and 12 show the base case forecast for gross product and employment by industry in the state. The base case forecast shows the Alabama economy going through the trough of the business cycle in 2000. Output growth rate declines to 1.4% that year, and then begins to climb. Output grows about 10% over the 5 years, and output in each sector grows at a similar rate. Employment in the state grows about 5% over the 5 years, with more of an increase in employment in services.

Table 13 shows electricity sector performance relative to the state economy. Growth in electricity output is higher than growth in state output through the trough in 2000, but then falls a bit behind growth in state output. The share of electricity in total value of output is constant.

The employment growth rate in Table 13 follows a similar pattern to output growth, but at lower levels. The expected growth rate of employment in the US is 1%, which reflects the growth of population to a significant degree. The historical record is the principal reason for the assumption of a lower residential electricity demand growth rate. Employment and output forecasts follow the same pattern with the respective shares remaining unchanged.

G. Continued wholesale competition in the AEM model

Under continued wholesale competition, consumers will continue to purchase electric power from a regulated distribution company with a franchise monopoly territory, their local company. The distribution utility will have no competitors. The consumer may choose how much power to buy and within limits the quality of service, but not the supplier. The local electric company has access to different wholesale suppliers of generation and other services in the industry.

Normal price reductions as a result of technological improvement will continue. The *Annual Energy Outlook (*EIA, 98) forecasts a decline in the average price of electricity in the US from $.069 to $.066 cents up to 2005 with continued wholesale competition. This translates into an annual price decline of 0.64% up to 2005. Alabama is already a low price state, and price reductions in Alabama would be no greater than that.

Applying the same percentage price decline in Alabama, continued wholesale competition implies a decline in the average retail price of electricity from $.053 to $.0515 per kWh by 2003. This decrease in price is used in the present simulations. The price is assumed to be the effective equilibrium price, taking into account the shape of the electricity supply curve. Different supply elasticities would result in different equilibrium prices and different price reductions. The necessary reduction in face value is assumed to result in the effective equilibrium price, translating into an annual 0.59% rate of price decline.

The price elasticity of demand used in the simulations is –0.56, the average demand elasticity reported by Barnett and Thompson (1997). There is a vast literature on estimating the demand for electricity. Barnett and Thompson survey this literature, and report a range of elasticity estimates between -.3 and –1. The price elasticity of demand equal to -.56 means that every 1% decrease in the price of electricity will result in a .56% increase in the quantity of electricity demanded. Revenue of the electricity industry will fall with the falling price.

Table 14 presents results of continued wholesale competition in the spreadsheet electricity model based on the above assumptions. Price reductions begin in 1999 and their impact on demand relative to the base case are determined. New demand levels are used to compute both the new electricity revenues and the change in consumer surplus.

The electricity utility sector loses revenue with the competitive price reductions. When the price elasticity of demand is between 0 and –1, any price decrease causes a revenue decrease. Quantity demanded rises when price falls, but not enough to offset the price decline. The price of electricity and the revenue of the electricity industry move in the same direction. Revenue losses are small, but increase over time. By 2003, revenue in electricity is $71 million less than it would have been with stable prices. The cumulative revenue loss over the 5 years is $208 million.

The change in consumer surplus in Table 14 is a gauge of the gains to consumers from the lower electricity prices. Consumer surplus is the difference between what consumers pay and the most they would be willing to pay for a given amount of electricity. Electricity consumers would typically pay more than the market price to obtain electricity service. Consumer surplus is a measure of these “net benefits” enjoyed by consumers.

With wholesale competition, consumer surplus increases by about 70% more than the losses in electricity revenue up to the year 2003. The impacts on the economy due to the lower electricity prices that occur with continued wholesale competition will be positive. Industry supply will also expand with the lower price of electricity input.

Table 15 shows the impact of continued wholesale competition on gross state product. Growth in gross state product is slightly higher due to the falling price of electricity. This stimulus flattens out, and output growth rates for the last two years are higher in the base case. The impact of continued wholesale electricity competition on output is very small, only a fraction of a percent.

Falling electricity prices will lower the total revenue in the electricity industry. This decline in revenue will occur in the generation sector of the industry. Transmission and distribution sectors will not be affected. The municipals and co-ops buy electricity from generators, and will not be adversely affected by the lower prices due to wholesale competition. The lower prices, in fact, will be passed along to customers of public utilities. Generators suffer with falling prices.

These simulations are in line with Joskow's (1998) conclusion that increased sector productivity and lower electricity prices will make only a small contribution to economic growth. Jaskow points out that price reductions will not be large enough and the product share of electricity is too small to have much impact on economic growth.

H. Sensitivity of the AEM

Table 16 shows the effect of relaxing the assumptions about the price elasticity of demand and the degree of price reduction. To give a fair treatment, such sensitivity of outcomes to key assumptions should be examined. Two other price elasticities are used, including an elasticity of -0.88 from the Maloney and McCormick (1996) study. The other is the weighted average using 1997 demand shares of the Considine (1995) estimates of short run substitution elasticities:

Sector	*elasticity*	*share*
residential	*-.079*	*.33*
commercial	*-.029*	*.19*
industrial	*-.104*	*.47*
other	*-.092*	*.01*
weighted average	*-0.08*	

Table 16 shows the price elasticity of demand has little effect on consumer surplus, given the small projected decreases in the price of electricity. Electricity revenues and the change in GSP, however, are more sensitive to the price elasticity. Electricity revenues rise with a higher price elasticity of demand. The change in consumer surplus is more sensitive to the extent of the price change. Irrespective of these sensitivities, however, the impact on GSP is miniscule.

VII. Changes in the Electric Industry with Retail Competition

Retail competition occurs when customers have choice. Retail firms would compete for the same customers. With competition in retail services, there could be more effort put into real time pricing, individualized meter service, and so on. Industrial contracts would become more flexible. The analogy is the retail competition that currently occurs for long distance telephone customers.

A. Structural changes

The structure of the industry would change with retail competition. The degree of vertical integration and market shares would be affected. Regulated distribution monopolies would maintain lines and charge line fees to retailers who compete for customers. There is less potential for retail competition for rural residential customers. The Kentucky study predicts that rural service will remain a regulated monopoly.

From an efficiency angle, the economies to be gained from retail competition are real time and peak load pricing, more flexible industrial contracts, and so on. Innovations in demand management may lead to some small efficiency gains. Most analysts think these cost savings will be small, and there will be costs associated with achieving them.

Retail competition in other states means that customers there will be able to choose cheaper Alabama electricity. With continued wholesale competition, the utilities in those states could either purchase Alabama electricity or run their own generators. With retail competition, consumers in high priced states can make the choice to buy cheaper electricity from sellers in Alabama or other low priced states.

B. Market dominance

Retailers of electricity may also be generating firms. For instance, an industrial customer in Alabama might be able to choose to purchase electricity from APC, AEC, or from utilities in the region. At the same time, customers in Florida, Georgia, Mississippi, or North Carolina can choose to buy Alabama electricity. An efficient generating firm could compete for customers anywhere in the state and region. Links between the generator, transmitter, distributor, and retailer will have to be worked out, from engineering, legal, and economic perspectives. With retail competition, customers make the choice of their electricity generator.

APC may be in position to expand, subject to antitrust considerations. It is very difficult to predict how the Federal Trade Commission will react to charges of monopoly power in a deregulated electricity industry. The key issue will be the extent of the market, the size of the relevant market for computing market shares. APC generates almost 2/3 of the electricity in Alabama, and 95% of the electricity in the state outside the TVA fence. In the region, however, APC would have a smaller market share.

C. Reliability of service

Utilities have an obligation to provide service to anyone in their distribution area. Retail competition would relax this obligation to serve. The Kentucky study predicts that competing retail firms will not want to serve customers in rural areas. Similar arguments were made before the airline industry was deregulated, and rural service may have suffered.

An important issue is the effect of retail competition on system load and supply. Exactly how the evolving electricity system will be coordinated is an unsettled issue. Technical issues of system control and redundancy are seldom discussed in the economic debate over restructuring. Real time meters, continuous flexible contracts, and capable sophisticated control centers are possibilities for the future, but these improvements have costs. Careful steps should characterize the process of changing the structure of the large and intricate electricity industry.

It would be wise to observe other states as they move into retail competition and to see what works and how it might be applied to Alabama. Especially relevant is what happens in other low cost states. With prices among the lowest in the country, Alabama has the incentive and certainly can afford to wait. Large industrial buyers in the state, however, will push for retail competition.

Some proponents tout retail competition as a magic bullet. The Maloney and McCormick study claims that electricity restructuring will perform all sorts of economic miracles, including an end to inflation. True improvements in the industry will be slow, and progress will depend on continued investment and research as well as increased competition.

D. Price Changes

Under the present regulated market structure, prices cover costs and a regulated rate of return on investment. If regulation has been successful, retail competition will have little effect on prices. Nationally, competition for retail customers will lower the average price. The overriding influence in Alabama, however, will be higher prices due to increased exports.

Alabama is a relatively low cost producer of electricity at present, and Alabama electricity will be a bargain in other states as retail competition opens. The implication is that the price of electricity in Alabama will rise to meet export demand. The present analysis assumes the price of electricity in Alabama will rise to regional and national averages as electricity is increasingly exported.

With retail competition in higher priced states, customers there will choose to buy cheaper Alabama electricity when they can. The clear implication is that prices in Alabama will rise as retail competition increases in the region. With continued wholesale competition, Alabama electricity will be exported only when it suits the utilities in the importing region. With retail competition, customers will make the choice.

E. Stranded costs

Stranded costs are an important economic and political issue in the national industry. The study on South Carolina estimates stranded costs to be $.01 per kWh spread across all customers. Retail competition is predicted to result in higher residential prices in South Carolina, in part because of the assessment of stranded costs. Estimates from the same sources are that Alabama has minimal stranded costs. The main difference between South Carolina and Alabama is that there are high cost nuclear plants in South Carolina.

Stranded cost is the difference between the book value of an asset and its market value. Book value is derived from historical cost, which has no connection with the existing market. Depreciation is based on tax laws. There is a limited market for electricity assets, and market values are not easily established. Replacement cost might be a reasonable way to set some asset values, but technology has evolved. Alabama already has stranded cost legislation in place, but it may be difficult to administer. Any significant stranded cost payments will likely be challenged in court.

F. Generation sources

There should be no immediate impact of retail competition on construction and retirement of generation equipment in Alabama. Nuclear and coal fired generators presently operate at low cost for base load service. New gas fired combined cycle generation plants in the state will expand capacity, not replace existing generation.

Under any form of retail competition, consumers will have the effective choice of lower cost generators. Alabama's generation costs are relatively low. To the extent that the transmission system will handle the exports, the main effect on Alabama generation will be increased demand from purchases in other states. Generation in Alabama will rise according to the comparative advantage the state has in generating electricity. Low gas prices in Alabama suggest the state will continue to have a comparative advantage in generation.

Lawmakers generally have little notion of the complexity of the electricity industry. The Maloney and McCormick study, which contains some reasoning that might not score well in intermediate economics courses, was used in congressional testimony.

G. Seasonal prices of electricity

Very little of the expenses of electricity are involved in customer service. Perhaps with more effort to customize service, electricity rates will fall. Peak load rates could result in lower electricity prices for some customers.

Consumption of electricity is higher during the summer for air conditioning and during the winter for heating. Peak load pricing could reduce the magnitude of these consumption peaks. Maloney and McCormick make the dubious claim that peak load pricing will result in complete smoothing of electricity consumption over seasonal cycles. There is, however, virtually no possibility of complete seasonal smoothing with retail competition (Barnett and Thompson, 1997).

H. Transmission

Retail competition will increase the demand for transmission services. Meaningful retail competition depends on an adequate and flexible transmission system with open access to all generation. Uncertainty about restructuring is discouraging investment in new transmission capacity. As restructuring unfolds, an integrated utility that both generates and has to transmit for its competitors will be able to design its transmission lines to discourage the entry of competitors.

Transmission interfaces between systems in a deregulated industry will become important. Complicating the issue for Alabama is the fact that the Southern Company, TVA, and AEC transmission lines extend across state borders. These interstate shipments are beyond the realm of state regulators, but may fall under some regional transmission regulatory plan.

There are critical interfaces between distribution areas. Retail consumers in other states will buy cheaper electricity in Alabama where the transmission system will transport it. There are incentives, however, not to ship a competitor's electricity.

As an example, suppose there are three utilities A, B, and C with prices $p_A < p_B < p_C$. Utility A would sell in the areas of both B and C if the transmission system would allow. Suppose utility B lies between A and C geographically. Utility B could develop its transmission and interface with utility C to sell its electricity at the higher price there. At the same time, utility B could impede its interface with A to keep A's cheaper electricity out of its area. Utility A could not sell as much as it would like to either B or C.

The EPAct calls for open access and wheeling of competitor's electricity, but transmission and interface design is a long-term issue, which may be difficult to oversee. This example shows why it is wise to divest or functionally unbundle transmission from generation. There is conflict of interest when a firm has to design its transmission and interfaces to transmit the electricity of its competitors.

Coordination of transmission is a central issue in restructuring. Several alternatives have been discussed. An independent system operator

(ISO) is a nonprofit operator of the transmission system. The ISO receives a fee based on its cost of operation. Part of the ISO or regulator's job will be to ensure that the transmission system is unbiased. New generators would be responsible for financing the transmission to connect to the existing system.

A transmission company or Transco would operate the transmission system for profit. As the sole operator of the transmission system, a Transco is a regulated monopoly. With the profit motive, a Transco would have the incentive to minimize cost. But as a monopoly, it may have incentives to restrict the services it provides and price at a monopoly level.

A firm with no interest in any particular generators best does optimal long-term planning and investment in transmission. The ISO or Transco should play a role in planning the transmission system. The difficult job of state or regional regulators will be to ensure that the transmission system is developed optimally, coordinated with the evolving pattern of generation, and operated in a competitively neutral way.

Ownership of the transmission system is not crucial for its efficient design and operation. Control and decision making, however, should be independent of generation firms.

Ownership of high voltage transmission lines in Alabama is concentrated under the ownership of the Southern Company (SoCo). Alabama Electric Cooperative (AEC) owns a portion of the transmission grid in the southern part of the state, and Tennessee Valley Authority (TVA) in the north.

The SoCo owns the largest capacity transmission lines. There are 500 kv lines connecting Farley, located in the southeast Alabama near Webb, to Miller and Gorgas, located in North Alabama near Birmingham. These lines have interfaces with TVA to the north of Birmingham, and to the west of Birmingham extending into Mississippi. There are 230 kv lines owned by SoCo extending from southern to northern Alabama, connecting various generating plants and substations throughout the state up to Birmingham.

AEC owns transmission lines from 115 kv to 230 kv capacity in the southern part of Alabama, extending into the Florida panhandle. TVA owns 115 kv to 500 kv transmission lines extending from northwest to northeast Alabama.

The South Eastern Electric Reliability Council (SERC), one of the ten regional reliability councils in the North American Electric Reliability Council, was formed in 1970. Due to the geographic size of the region and the diversity among its parts, SERC was divided into sub-regions for data reporting purposes. Alabama is in the southern sub-region that includes Georgia and some of southeastern Mississippi. Transfer capability studies are carried out between these regions.

As reported in 1998, the SoCo has a 243-megawatt interface with Duke Power to the northeast. To the north, there is a 529-megawatt interface with TVA. To the east, there is a 644-megawatt interface with Entergy. In 2002, these interfaces are expected to increase to 786 megawatts with Duke, 909 megawatts with TVA, and 741 megawatts with Entergy. This is an increase in interface capacity will facilitate increased exports from Alabama, already the major exporting state in the southeast.

I. Environmental impacts

When production increases as Alabama exports its electricity, the level of pollution in the state will rise. There are nonattainment areas in Alabama that now face close monitoring. Generators must meet Phase II sulfur dioxide requirements in 2000. Mercury emission standards will cause further pollution abatement problems. Nitrogen oxide emissions must be reduced substantially. There is uncertainty over pending carbon dioxide emission requirements.

Pollution regulations are being changed at the same time restructuring is being introduced, making it very difficult for the industry to plan ahead. Traditionally, large generators have taken eight to ten years to complete. Environmental laws, along with changing market conditions, may force a trend in generation toward smaller gas fired generators and fuel cells.

The feasibility of using coal in the long run is subject to changing environmental regulation. Phase II allowances on sulfur dioxides and nitrogen oxide controls are causing generators to switch fuels and install expensive pollution abatement equipment. This will raise the cost of coal generation. These environmental regulations could have larger impacts on electricity prices than competition in Alabama.

Linden (1997) stresses the trend toward natural gas due to environmental laws. Natural gas simply burns cleaner. Durability of the new combined cycle gas technologies in the long run, however, is an open question. Additionally, the price of gas is projected by the Department of Energy to begin a slow but steady climb.

J. Regulatory factors

Both state and federal regulations will come into play with retail competition. Exactly how deregulated the industry will become, and the role of the Public Service Commission in the new regime are not clear. Interstate transmission of electricity implies that regional FERC regulation will be necessary to oversee the regional system. The governments of Alabama and other states, however, will not want to give up their regulatory power.

Antitrust issues are beginning to arise in airlines, banking, and telecommunications, industries that have been recently deregulated. Antitrust decisions of the FTC are likely to influence the evolution of a restructured electricity industry. Decisions of the FTC are not always based on sound economic analysis. Mergers and antitrust issues will certainly arise in the electricity industry. Having to deal with the FTC will also present a new set of expenses for the electricity industry.

K. Electricity exporting

Alabama is a low cost producer of electricity, and appears poised to become more of an exporter of electricity to other states. About one third of the electricity produced in Alabama is exported at present. Increased exports to Georgia, Florida, and Mississippi appear to be an immediate possibility because the average price of electricity is higher in those neighboring states. As retail competition evolves, the transmission system will partly determine the pattern of electricity prices across states. Evidently there are transmission constraints to Florida. Coordination of a regional electricity system promises to be a challenge.

Table 17 shows the prices of electricity by customer class in Alabama, surrounding states, and the US. Electricity prices in Alabama are relatively low. The average price of electricity in Alabama is about two thirds of the national level. In the region, only Kentucky has lower prices for all customer classes, and Tennessee has lower residential prices.

SoCo's area extends from Alabama into Florida, Georgia, and Mississippi. The TVA area extends from Tennessee into Alabama, Georgia, Mississippi, Kentucky, and little pieces of Virginia and North Carolina. AEC has customers in Alabama and Florida. In short, shipments of electricity within these firms go across state borders. Exporting electricity by itself could cause a higher price of electricity inside Alabama due to the increased demand for electricity from outside the state.

In general, electricity will flow from states with low prices to states with high prices. When interstate trade in electricity increases, the winners will be the suppliers in the exporting states and the consumers in the importing states. Losers will be the consumers in the exporting states who have to pay higher prices, and producers in the importing states who suffer from competition and lower prices. The cited studies of Kentucky and South Carolina both project higher prices for electricity in those states due to electricity exporting.

Alabama will become more of an exporter in the interstate market, which will mean higher electricity prices in Alabama. Over time, more generation facilities could be built to meet export demand, which would mitigate price increases. At the same time, an expanded transmission system will increase the ability of Alabama to export electricity.

As a note, trade between the states has not always been free. In colonial days, tariffs were charged on goods as they crossed state borders. Interstate trucking faced restrictions and taxes as it crossed state borders up until the 1970s. States in the US form a free trade area, with no tariffs or taxes levied on goods as they cross borders. Free trade creates overall gains and increases total output. With a move to free trade, however, there will be losers. In the Alabama electricity market, losers will be electricity consumers.

The amount of the price increase due to electricity exporting is difficult to estimate. The study on Kentucky assumes the price in Kentucky rises to the average price in the US due to exporting. A study on Indiana uses prices in the neighboring states, and we make a similar assumption.

The present study works with a smaller price increase in Alabama, 10% rather than the 30% increase that would be required to bring the average price in Alabama up to the national average.

At the price of $.053, production is 108 million mWh and consumption is 73 million mWh. Exports are the difference, 35 million mWh. If the price increases by 10% to $.058, the average of adjoining states, the quantity produced increases and the quantity demanded decreases. The amount of these changes depends on price elasticities of demand and supply. Consumers in the state lose, paying more for less electricity. Electricity generators win, selling more electricity at a higher price.

Higher price elasticities of supply and demand would mean less of an increase in exports. Elasticities of 1 and -1 would mean that every 1% increase in price would cause a 1% decrease in quantity demanded and increase in quantity supplied. The 10% increase in price would cause a 10% decrease in quantity demanded, and a 10% increase in the quantity supplied.

The true price elasticity of demand for electricity is probably somewhere between -1 and -.5. Estimates vary depending on the assumptions made, the amount of time allowed for adjustment, how average prices are derived, and so on. There are no estimates of the price elasticity of supply because the industry has been based on regulated monopolies that are not free to set prices or output.

The changes in production, consumption, and exports under different assumptions about price changes and elasticities can be calculated. First, the 10% increase in the average price of electricity is compared with an increase of 30%, which would bring the price in Alabama to the national average of $.069. Consumption, production, and exports with supply and demand price elasticities equal to –1 and 1 are:

price	*consumption*	*production*	*exports*
$.058	*66*	*119*	*53*
$.069	*51*	*140*	*90*

Exports rise more in response to the higher price. The drop in consumption with the price elasticity of demand equal to –1 is quite large. Consumption drops by the same percentage as the decline in price. Production also increases considerably. An increase from 108 million mWh to either 119 million mWh or 140 million mWh would not happen overnight. Investment in generation and transmission would have to occur.

With the smaller price elasticities, -.5 for demand and .5 for supply, the changes in consumption, production, and exports are:

price	*consumption*	*production*	*exports*
$.058	*69*	*113*	*44*
$.069	*62*	*124*	*52*

Consumption decreases by half the percentage change in price. With an increase in price to $.058, consumption falls to 69 million mWh and production increases to 113 million mWh. Alabama then exports 39% of its generation.

These changes with price elasticities of .5 and -.5 and an increase in price to $.058 are the most reasonable prediction for the Alabama electricity market. Consumption in the state drops 5%. Exports rise from 35 million mWh to 44 million mWh, an increase of 25%. The interface capability of

SoCo planned for 2002 should support this level of exports from Alabama.

Increased exports of electricity could reduce the quality of service inside the state. Once a commitment is made to export electricity, that generator is not available for backup generation inside the state. In the long run, there would be increased capacity, but there could be years or seasons when the system is overworked.

Service planning has traditionally been an important activity for utilities. Reliability of the system has been very high. Still, there is a general shortage of electricity in the southeast area. High growth has put pressure on utilities to expand to meet growing demand. A market system for electricity will be more subject to boom and bust cycles than a regulated system. Cycles of shortages and surpluses, with rising and falling prices, characterize markets for many goods and services. Electricity will be no different.

If contracts for sales outside the state are met, there might be less reliable electricity supply inside the state. During periods of unanticipated electricity demand, the system relies on excess capacity to meet demand. There have been episodes of brown outs at different times in different parts of the country. These episodes are likely to increase under retail competition. The uncertainty faced by utility companies will also increase with retail competition.

L. Retail competition: impact and sensitivity

With retail competition, consumers will be able to purchase electricity from competitive marketers, or they may remain with the local utility company and purchase bundled services as in the past. The essential difference is that the consumer, rather than the local electric company, will have the choice.

The present assumption for price under retail competition is that it will rise in Alabama to the regional SERC average of $.056 per kWh in 1999. This assumption is consistent with the AEO98 finding that there are strong pressures for prices to converge within the region. Prices are assumed to rise from $.053 to the regional average $.058 right away. Then price will decline to the projected regional average of $.056 per kWh in 2003.

Table 18 shows the impacts of retail competition under different assumptions about the price elasticity of demand and change in price. Using different assumptions gives a feel for how sensitive the model is to different assumptions. The top five rows show the base case, with electricity prices unchanged. Projected growth in the economy results in higher electricity demand and higher revenue in the electricity industry. Gross state product GSP increases by 13% to $110 billion by 2003. Gross revenue in the electricity industry increases by 14% to $2.6 billion.

The next four groups of results make different assumptions about the price elasticity of demand and the path of price. The first three groups of results assume price jumps to the regional average in 1999, and then begins the projected decline to $.056. The demand elasticities used are a medium level (-.56), high level (-.88), and low level (-.08). The medium level is most appropriate.

Higher prices result in a lower quantity of electricity demanded relative to the base case. Electricity revenues are higher than in the base case due to the price inelastic demand for electricity. In the first simulation, for instance, electricity revenue is 2% higher than in the base case in 2003, $4,506 million versus $4,418 million. With highly inelastic demand (-.08) electricity revenue is $4,630 million, 4% higher than in the base case.

Consumer surplus falls with the higher price of electricity. Higher prices mean less consumer surplus in every simulation. With higher prices, consumers buy less electricity, and what is bought costs more.

GSP falls in every simulation with the higher price of electricity. In the first simulation, GSP is $165.9 million less than it would have been with a steady price of electricity. This is a decline of only 0.15%. The largest single year effect of higher electricity prices on GSP occurs in 1999 with a price elasticity of -.08, but this is only a 0.38% decline relative to the base case. The decreases in GSP with the higher price of electricity are very small.

Retail competition results in losses all around and revenue gains only for the electric utilities. Electric utilities as a group can expect revenue to increase between 2% and 4% with retail competition. Individual electric utility firms, however, will be facing the entry of competition. Also, higher revenues do not imply that profits will rise. Electricity sales in the state decrease with the higher price, but more electricity is exported.

These simulations show that except for electric services, all other sectors in the economy experience decreases in gross product compared to the base case. These decreases occur because the sectors produce less with a higher price of electricity. The higher price induces a decrease in the quantity of electricity demanded. Electric services gross product increases as a result of increased revenues from meeting slightly less quantity demanded but at higher prices. Again, the impact on industrial employment is similar to that of the gross product, with employment being lower than the base case. Employment also grows at a lower rate than gross product.

Sensitivity results show that variation in the price elasticity of demand has little effect the consumer surplus. Electricity revenue, however, is sensitive to the price elasticity of demand. Electricity revenue increases more with more price inelastic demand. The change in consumer surplus is more sensitive to the extent of price changes.

The negative impacts of retail competition lead to the conclusion that retail competition is not a wise option for Alabama at this time. Considering economic development issues and the impact on investment spending in the state, the overall impact would be bleaker.

VIII. Electricity Restructuring and Industrial Adjustment

The present section compares the base line model predictions of industrial adjustment in Tables 11 and 12 with predictions of the AEM under continued wholesale competition and retail competition. In the base line case, the price of electricity stays at $.053 per kWh. With continued wholesale competition, the price of electricity falls 2.8% to $.0515 over five years because of competition and entry in the industry. Under retail competition, the price of electricity rises 5.7% to the regional average of $.056 due to exports from Alabama.

A. Industrial adjustment with continued wholesale competition

Table 19 shows forecasted GSP with continued wholesale competition. The forecast shows that except for electric services, all other sectors in the economy experience very small increases in gross product compared to the base case. These increases arise because the sectors buy more electric power at the lower price.

Total GSP rises with continued wholesale competition relative to the base case, but only by 0.06%. These increases arise because the sectors produce more with a lower price of electricity. Electric services gross product decreases by 1.5% relative to the base case in Table 11. The sector is able to bear the revenue losses because of technological change and reductions in operations and maintenance costs.

The impact on employment in Table 20 is similar to the impact on gross product, with overall employment at a slightly higher level than the base case. Total employment rises, but by only 0.03% relative to the base case in Table 12, a projected gain of only 600 jobs by 2003. Employment grows at a lower rate than gross product. The effects across industries for continued wholesale competition relative to the base case of steady electricity prices are extremely small in Alabama.

Continued wholesale competition results in revenue losses to electric utilities, gains in consumer surplus, and small increases in state output. The net impact on GSP depends on the extent of the price reduction. It is unlikely that continued wholesale competition would cause large price declines in Alabama.

B. Industrial adjustment with retail competition

Table 21 shows the retail competition forecasts for GSP. Retail competition results in losses all around and gains only for the electric utilities. All sectors in the economy except for electric services experience decreases in gross product compared to the base case. These decreases arise because sectors produce less with the higher price of electricity input. Electric services gross product increases as a result of the higher prices.

Table 22 shows the impacts on industrial employment, which are similar to the changes for gross product. Employment levels fall below the base case. Employment, however, shrinks at an lower rate than gross product. Relative to the base case, there is a –0.06% decline in employment, a loss of 1200 jobs.

Table 23 shows the percentage change in output with a move from continued wholesale competition to retail competition for all industries up to the year 2003. Table 23 compares retail competition in Table 21 with continued wholesale competition in Table 11. Total state output would decline, but by only 0.2% relative to the base case with wholesale competition. The service sector of the economy declines by 0.3%. The increase in the electricity industry by 3.3% is not enough to offset the decline in finance, banking, transportation, and communication.

The effects on industry due to the higher price of electricity are not large. Industrial outputs that experience more than a 1% decrease in output in Table 23 are Other Durable Goods –4.5%, Textile Mill Products –1.5%, Motor Vehicles –1.4%, Furniture and Fixtures –1.3%, and Mining –1.2%.

If the electric services industry is netted out of Tables 19 and 21, state GSP remains higher with wholesale competition. With continued wholesale competition, GSP in 2003 would be $107,412 million netting out electric services. With retail competition, GSP would be $107,100 million.

The electric services industry enjoys a 3.3% increase in the revenue from sales within the state, and a 15% increase in revenue with retail competition and increased exports. The cost of retail competition will be spread around many industries in the state economy.

IX. Retail Competition, Taxes, and Economic Development

In 1996, electricity output added $1.7 billion to Alabama's gross output of $99.2 billion. This 2% share of output understates the importance of electricity. The paper, chemical, primary metal, and textile industries are heavy users of electricity, and account for 7.3% of output in Alabama.

Higher prices for electricity will make industry in Alabama less competitive. Higher residential prices will lower the real income of Alabama households.

The effect of retail electric competition on Alabama's economy will depend mostly on the changes in industrial electricity prices. Wholesale competition from co-generation and potential merchant generators will put downward pressure on prices of industrial electricity, but exports due to retail competition will put upward pressure on prices in Alabama. Industrial rates are likely to vary more than at present, depending on load factors and location. There is likely to be less averaging within customer classes, with prices set according to the specific condition of each customer.

A. Tax issues

The values of assets in the electricity industry will move with electricity prices. Increased exports and higher electricity prices in the state will increase the value of existing assets. Generally, the value of assets will follow electricity prices. Increased exporting of electricity and higher prices would result in higher property taxes paid by the industry.

Industrial development will affect property taxes. If industrial electricity prices rise, there will be decreased industrial investment and decreased taxes on industrial assets.

Interstate transmission raises the potential of taxing out of state consumers. While exports from one state to another cannot be taxed, state and local taxes on generators will raise the price of exported electricity for out of state customers. Sales taxes on electricity entering the grid and transmission taxes have the similar effects on interstate transactions. It is best to remember, however, that consumers in the state would have to pay the same taxes.

The effect of retail competition on state income tax receipts will depend on how income is redistributed. Higher industrial prices will decrease industrial activity and lower the income of workers in the declining industries. If generation and transmission expand due to higher exports, income will rise in those industries.

Local franchise fees will rise as electricity prices and bills rise. The municipalities will want a share of the increased revenue from electricity sales. Franchise fees are currently 3% inside city limits and 1.5% inside police jurisdictions. The link between distribution and retailing electricity may change. Distributors would pay local franchise fees under restructuring. Retailers might also pay local taxes.

Table 24 shows the percentages of total tax revenues from different sources from 1984 to 1997. The numbers in Table 24 are all percentages. In 1997, for instance, 42.80% of state tax revenue came from income taxes on corporations and individuals. Of these, 4.59% were from corporations and 38.20% from individuals. Sales taxes were 26.02% of total revenues.

The last five columns show taxes from utilities. The sum of the taxes on utilities in 1997 was 9.97% of state tax revenue. About one tenth of the state tax revenue in 1997 came from electric utilities, more than electricity's share of output.

Sales taxes, income taxes, franchise taxes, and gross tax receipts will tend to move with GSP because of the relatively constant tax shares. These taxes will rise slightly under continued wholesale competition, but will fall under retail competition. The impact of competition in the electric utility industry on state tax receipts will be in the same directions as the impacts on output. Over a slightly longer time frame, total tax receipts have remained in the range of 4.9% to 5.4% of gross state product, with an average of 5.1%.

Table 25 shows the history of state tax revenue derived from the electricity industry. The average share of electricity in total tax revenue since 1978 is 8.7%, which does not include the franchise taxes in Table 24. The electricity industry is easy to tax, since it is plainly visible and regulated by the state. The impact of competition in the electric utility industry on state tax receipts will be in the direction of the impacts on output. Tax receipts will move with electricity revenue.

The ad valorem tax is based on the valuation of the physical property in the industry. It varies with the level of investment in non-exempt property, the rate of depreciation of these assets, and other legislative provisions regarding such property (Legislative Fiscal Office, 1997). These electricity properties are the major portion of some municipal tax bases. Physical electricity assets are plainly visible and easy to tax. Any variation in their value changes the municipal tax base and the amount of municipal tax revenues.

B. Economic development

The incentive structure of economic development will change with restructuring. In the past, electric companies worked with local and state governments to encourage new industry to locate in Alabama and to promote general economic development. Under retail competition, this type of promotion will be left to local and state governments, and to competition among utilities.

Lower electricity prices with retail competition would attract certain types of industry, but rising prices in Alabama due to electricity exporting would discourage industry from investing in the state. Comparative electricity prices across states will remain crucial. The price of electricity in high priced states relative to low priced states will fall. The key issue will be what happens to industrial electricity prices in Alabama relative to other states.

Table 26 lists the 67 counties in Alabama, with their income per capita and population density. The poorer areas in Alabama attract economic development effort, and will be the most affected by higher electricity prices. Less dense counties have lower incomes. The correlation between population density and income per capita across Alabama counties is .73. There are 57 counties that have below average income per capita. Of these 57, there are 44 with below average population density. Only Baldwin County has below average population density but above average income per capita. There are 8 counties with less than 75% of the average per capita income, and 6 of these have only 25% of the average population density. These 8 counties are all serviced by electric co-ops. Of the 9 counties with less than 25% of the average population density, all have below average income and 3 have below 75% of the average income.

These facts confirm that the less dense areas in Alabama have low income. These poor rural areas in the state are largely served by the electric co-ops. Retail competition is unlikely to have an impact in these areas. An end to cross subsidies means that these poor areas will experience rising electricity prices with retail competition.

Hollas and Stansell (1995) present evidence that there is less profit for the electric utilities in less dense areas. The main effect of retail electricity competition on these poor areas will be the higher prices for electricity as exports from Alabama increase. Higher rural electricity prices will result in lower real incomes and reduced economic development potential in these areas.

Table 27 lists the average residential price for the distribution co-ops, Alabama Power, and the entire state. Only 6 of the 23 co-ops price below the state average. The co-ops serve less dense areas in the state, and have higher distribution costs.

The real price of electricity has been on the decline for the past two decades. For electric competition to have a significant impact on economic growth, the electric sector's contribution to the state output and the induced price reductions would have to be large. For Alabama, electricity is only 2.4% of GSP.

Income distribution is another important issue of development. The challenge lies in the design of an equitable distribution mechanism for the costs and benefits of restructuring. In most states, programs are in place to guarantee that the most vulnerable citizens have access to electric power. Economic efficiency will bypass the interests of low-income customers, as stressed by Smeloff and Asmus (1997). Large industrial customers will negotiate lower prices for themselves, leaving residential consumers to bear an increasing share of the cost of electricity service providers.

Competition may depress some research and development (R&D) activity. Monopolies have traditionally had budgets for R&D. Competitive forces, however, are likely to stimulate innovation. The net effect on technical change is difficult to predict.

The impact of electric competition on the environment is difficult to determine in advance. The electricity sector has major impacts on the environment, both air and water. Environmentalists are concerned that competition in electricity will have adverse environmental effects, but this need not be so. Electric sector reform in England has been responsible for a substantial reduction in air pollution, including carbon emissions. One concern with restructuring is that the life of relatively dirty power plants may be extended.

X. Conclusion

There are incentives to proceed cautiously toward retail competition in Alabama's electricity industry because of higher prices for Alabama consumers, the complexities of the economic issues involved, the evolving legal setting, physical limitations of the transmission system, and issues of equity and fairness. The form that retail competition will take in the new regulatory regime is unsettled.

When electricity policy and the regulatory setup change, there will be winners and losers. Assuming existing technology and environmental laws, the main losers in Alabama with retail competition will be residential customers. Large industrial customers might be able to bargain for lower rates, but increased electricity exports could mean higher electricity prices for all customers in Alabama.

The effect on industrial development will depend on the evolution of the industrial prices of electricity relative to other states. Changing technology, tighter environmental laws, and the new form of regulation will affect these predicted outcomes. The electricity industry as a whole will gain, but incumbent utilities will face the entry of competition.

Alabama's utilities have among the lowest prices in the nation. The state should maintain its comparative advantage in electricity. Higher costs due to pending tightening of emission controls will not affect the comparative advantage of Alabama, since other states in the region will have to meet the same regulations.

The Alabama Econometric Model predicts that the industrial adjustments due to retail competition will be small. There will be some adjustment, but electricity is a small share of the cost of most industries, and the projected change in the price of electricity is not too large. With retail competition, the econometric model predicts that total gross state product will fall by only a fraction of one percent.

Antitrust issues are likely to arise in the electricity industry. The pending legal issue will be defining the breadth of the market and establishing market shares. The interstate transmission system is the key to regional retail competition. Each state is struggling with its own particular regulatory and competitive situation. It is safe to say that the next decade of the electricity industry will not be much like the last few decades.

In summary, the impacts of retail competition are likely to include higher electricity prices for most consumers and reduced economic growth. The country as a whole may benefit from restructuring of electric utilities, but not all states will gain, at least in the short run. Alabama is likely to be among the states with higher electricity prices. The damage will be compounded if mistakes are made in formulating restructuring. Alabama can afford to wait and learn from the experiences and mistakes of other states in the move to retail competition in electricity.

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Table 1

State Electricity Sales by Customer Class, 1997

	residential	commercial	industrial	total
AL	34%	19%	46%	73
TN	39%	13%	47%	86
MS	37%	21%	40%	40
FL	50%	36%	10%	175
GA	36%	30%	33%	100
KY	27%	14%	54%	76
US	34%	29%	33%	3,115

million mWh

Table 2

State Electricity Revenue by Customer Class, 1997

	residential	commercial	industrial	total
AL	42%	23%	33%	$3.9
TN	44%	16%	38%	$4.5
MS	44%	24%	29%	$2.3
FL	56%	34%	7%	$12.7
GA	44%	33%	22%	$6.4
KY	38%	18%	39%	$3.1
US	42%	33%	22%	$214.3

$ billion

Table 3

Recent Electricity Exports from Alabama

	consumption	*generation*	*exports*	*%exported*
1993	64,935	99,411	34,476	34.6%
1994	67,584	95,175	27,591	29.0%
1995	70,017	99,380	29,363	29.5%
1996	72,571	115,093	42,522	36.9%
1997	73,410	113,648	40,274	35.4%

million kWh

Table 4

Energy Consumption Shares in Alabama, 1995

	residential	*commercial*	*industrial*	
electricity	52%	57%	15%	
coal	0%	0%	19%	
oil	7%	7%	14%	
gas	32%	35%	30%	
biofuel	9%	0%	21%	
total	332	167	975	*trillion Btu's*

Table 5

Electric Service Utilities in Alabama

Alabama Electric Cooperative	Alabama Municipal Elc Auth
Alabama Power Company	Arab Electric Co-Operative
Baldwin Cnty Elc Mmbrship Crp	Black Warrior Elc Membership
Central Alabama Elc	Cherokee Electric
City of Andalusia Utility	City of Athens Utilities
City of Dothan Electric Utility	City of Florence Utilities
City of Guntersville Electric Board	City of Huntsville Utilities
City of Opelika Light & Power	City of Tuscumbia Utilities Department
Clark-Wshington Elc Membership	Coosa Valley Electric Coop
Covington Electric Cooperative	Cullman Electric Co-Operative
Dixie Electric Cooperative	Electric Board of Russellville
Electric Board of Guntersville	Fort Payne Improvement Auth
Franklin Electric Cooporatives	Georgia Power Company
Hartselle Utilities	Joe Wheeler Elc Membership
Marshall-Dekalb Electric Coop	Municipal Utilities Board, Decatur
Muscle Shoals Electrical Board	North Alabama Electric Coop
Pea River Electric Coop	Pioneer Electric Cooperative
Sand Mountain Electric Coop	Sheffield Utilities
Southern Pine Electric Coop	Tallapoosa River Electric Coop
Tennessee Valley Authority	Albertville Energy Svcs
Tombigbee Electric Cooperative	Utilities Board of the City of Riveria

Table 6

Alabama Electric Service Companies & City of Operation

NAME	TRADE	CITY
Al Power Co	Apco Power Generating Svc	Calera
Alabama Electric Cooperative		Andalusia
Alabama Electric Cooperative	Lowman	Leroy
Alabama Municipal Elc Auth		Montgomery
Alabama Power Co Henry Da		Ohatchee
Alabama Power Co Substati		Jacksonville
Alabama Power Co Substation		Luverne
Alabama Power Company		Abbeville
Alabama Power Company		Alexander City
Alabama Power Company		Aliceville
Alabama Power Company		Anniston
Alabama Power Company		Ashford
Alabama Power Company		Ashland
Alabama Power Company		Ashville
Alabama Power Company		Atmore
Alabama Power Company		Auburn
Alabama Power Company	Al Power Co	Bay Minette
Alabama Power Company		Bayou La Batre
Alabama Power Company	Alabama Power Co	Bessemer
Alabama Power Company		Birmingham
Alabama Power Company		Blountsville
Alabama Power Company		Brewton
Alabama Power Company	Barry Steam Plant	Bucks
Alabama Power Company		Butler
Alabama Power Company		Camden
Alabama Power Company		Carbon Hill
Alabama Power Company		Centreville
Alabama Power Company		Childersburg
Alabama Power Company		Citronelle
Alabama Power Company		Clanton
Alabama Power Company		Clayton
Alabama Power Company		Columbiana
Alabama Power Company		Dadeville
Alabama Power Company	Southern Services	Daleville
Alabama Power Company		Demopolis
Alabama Power Company		Dora
Alabama Power Company	Electric Utility	Enterprise
Alabama Power Company	Southeast Division	Eufaula
Alabama Power Company		Eutaw
Alabama Power Company		Fairfield
Alabama Power Company		Fayette
Alabama Power Company		Flomaton
Alabama Power Company		Florala
Alabama Power Company		Fort Deposit
Alabama Power Company		Gadsden
Alabama Power Company		Gardendale
Alabama Power Company		Geneva
Alabama Power Company		Goodwater
Alabama Power Company		Graysville
Alabama Power Company		Greensboro
Alabama Power Company		Greenville
Alabama Power Company		Grove Hill
Alabama Power Company		Haleyville
Alabama Power Company		Hamilton
Alabama Power Company	Headland Division	Headland
Alabama Power Company		Heflin
Alabama Power Company	Alabama Power Co	Hurtsboro
Alabama Power Company		Jackson
Alabama Power Company		Jacksonville
Alabama Power Company		Jasper
Alabama Power Company		Leeds
Alabama Power Company		Leesburg

Alabama Power Company		Linden
Alabama Power Company		Livingston
Alabama Power Company		Marion
Alabama Power Company		Mobile
Alabama Power Company		Monroeville
Alabama Power Company		Montevallo
Alabama Power Company		Montgomery
Alabama Power Company		Northport
Alabama Power Company	Electric Utility	Oneonta
Alabama Power Company		Oxford
Alabama Power Company		Ozark
Alabama Power Company		Parrish
Alabama Power Company		Parrish
Alabama Power Company		Pelham
Alabama Power Company		Phenix City
Alabama Power Company		Prattville
Alabama Power Company		Prichard
Alabama Power Company	Miller Jh Steam Plant	Quinton
Alabama Power Company		Ragland
Alabama Power Company		Reform
Alabama Power Company		Roanoke
Alabama Power Company		Saraland
Alabama Power Company		Selma
Alabama Power Company		Slocomb
Alabama Power Company	Alabama Power Co	Springville
Alabama Power Company		Sulligent
Alabama Power Company		Sylacauga
Alabama Power Company		Talladega
Alabama Power Company		Theodore
Alabama Power Company		Theodore
Alabama Power Company		Thomasville
Alabama Power Company		Tuscaloosa
Alabama Power Company		Union Springs
Alabama Power Company		Uniontown
Alabama Power Company		Valley
Alabama Power Company		Wedowee
Alabama Power Company		West Blocton
Alabama Power Company		Wetumpka
Alabama Power Company	Gaston Steam Plant	Wilsonville
Alabama Power Company		Winfield
Alabama Power Company		York
Alabama Power Trans Sub Stn		Samson
Arab Electric Co-Operative		Arab
Baldwin Cnty Elc Mmbrship Crp		Bay Minette
Baldwin Cnty Elc Mmbrship Crp	EMC	Gulf Shores
Baldwin Cnty Elc Mmbrship Crp		Summerdale
Black Warrior Elc Membership		Demopolis
Black Warrior Elc Membership		Eutaw
Central Alabama Elc (co Op)		Clanton
Central Alabama Elc Co Coop		Wetumpka
Central Alabama Elc Co Optv		Autaugaville
Central Alabama Electric Coop		Prattville
Cherokee Electric Co-Operative		Centre
City Andalusia Utility		Andalusia
City of Athens	Athens Utilities	Athens
City of Dothan	Dothan Electric Utility	Dothan
City of Florence	Florence Utilities	Florence
City of Guntersville	Guntersville Electric Board	Guntersville
City of Huntsville	Huntsville Utilities	Huntsville
City of Opelika	Opelika Light & Power	Opelika
City of Tuscumbia	Tuscumbia Utilities Department	Tuscumbia
Clark-Wshington Elc Membership		Jackson
Coosa Valley Electric Coop		Talladega
Covington Elec Coop		Brantley
Covington Electric Cooperative		Andalusia
Covington Electric Cooperative		Enterprise
Covington Electric Cooperative		Samson
Crestwood Corporation		Dothan
Cullman Electric Co-Operative		Cullman
Dixie Electric Cooperative		Pike Road

Dixie Electric Cooperative		Union Springs
Russellville Electric Board		Russellville
Electric Board of Guntersville		Guntersville
Fort Payne Improvement Auth		Fort Payne
Franklin Electric Co-Operative		Russellville
Franklin Electric Cooporatives		Red Bay
Georgia Power Company		Salem
Georgia Power Company	Georgia Power Co	Valley
Hartselle Utilities		Hartselle
Hartselle Utilities Inc		Hartselle
Joe Wheeler Elc Membership		Moulton
Joe Wheeler Elc Membership		Trinity
Marshall-Dekalb Electric Coop		Boaz
Municipal Utilities Board	Decatur Utilities	Decatur
Muscle Shoals Electrical Board		Muscle Shoals
North Alabama Electric Co Op		Scottsboro
North Alabama Electric Coop		Stevenson
Pea River Electric Coop		Ozark
Pioneer Electric Cooperative		Greenville
Pioneer Electric Cooperative		Selma
Reservation Utilities		Atmore
Sand Mountain Electric Coop		Rainsville
Sheffield Utilities		Sheffield
Southern Pine Electric Coop		Brewton
Southern Pine Electric Coop		Frisco City
Tallapoosa River Elec Co		Cragford
Tallapoosa River Electric Coop		Lafayette
Tennessee Valley Authority	T V A-Albertville Energy Svcs	Albertville
Tennessee Valley Authority	T V A-Arab Energy Svcs	Arab
Tennessee Valley Authority	Browns Ferry Nuclear Plant	Athens
Tennessee Valley Authority	T V A-Tarrant Energy Svcs	Birmingham
Tennessee Valley Authority	T V A-Trinity Substation	Decatur
Tennessee Valley Authority	T V A-Decatur Line Crew	Decatur
Tennessee Valley Authority	T V A-Guntersville Hydro Plant	Guntersville
Tennessee Valley Authority	T V A-Guntersville Maint Base	Guntersville
Tennessee Valley Authority	T V A-Gntrsvlle Fssil Hyrdpwer	Guntersville
Tennessee Valley Authority	T V A-Bellefonte Nuclear Plant	Hollywood
Tennessee Valley Authority	T V A-Aquatic Research Fcilty	Langston
Tennessee Valley Authority	T V A-Wilson Hydro Plant	Muscle Shoals
Tennessee Valley Authority	T V A-Scottsboro Energy Svcs	Scottsboro
Tennessee Valley Authority	T V A-Widows Creek Fossil	Stevenson
Tennessee Valley Authority	T V A-Wheeler Hydro	Town Creek
Tennessee Valley Authority	T V A-Colbert Fossil	Tuscumbia
Tombigbee Electric Cooperative		Guin
Utilities Board of Foley	Riviera Utilities	Foley
Wheeler Joe Elc Membership		Trinity

Source: Dunn & Bradstreet.

Table 7
Electric Utility Output & Employment History

1992 $	GSP	Electric Product	Share Of GSP	Employment W & S	Electric W & S	Employment Share	Tax Revenue
	$mil	**$mil**	**%**	**'000s**	**000's**	**%**	**$mil**
1978	59789	1574.3	2.6	1475.0	11.4	0.8	1477.7
1979	60772	1545.5	2.5	1498.2	11.2	0.7	1646.1
1980	60632	1542.3	2.5	1491.7	11.5	0.8	1786.8
1981	60933	1581.2	2.6	1483.1	11.9	0.8	2081.2
1982	57901	1516.0	2.6	1447.7	11.9	0.8	2112.3
1983	61636	1535.4	2.5	1464.8	12.4	0.8	2288.2
1984	64200	1603.2	2.5	1524.6	12.7	0.8	2637.8
1985	67519	1552.4	2.3	1562.3	12.9	0.8	2772.6
1986	68530	1467.0	2.1	1591.8	12.9	0.8	2846.8
1987	71393	1605.1	2.2	1643.3	13.2	0.8	3053.0
1988	74241	1812.2	2.4	1693.8	13.3	0.8	3184.0
1989	74514	1856.8	2.5	1733.6	13.3	0.8	3455.8
1990	75398	1952.2	2.6	1758.3	13.3	0.8	3625.1
1991	76950	2016.9	2.6	1770.3	13.4	0.8	3764.4
1992	79604	1848.6	2.3	1806.5	13.3	0.7	4319.5
1993	81100	1894.5	2.3	1846.0	13.3	0.7	4451.2
1994	85543	1875.0	2.2	1877.0	13.2	0.7	4633.2
1995	88763	2091.6	2.4	1923.9	12.8	0.7	4895.7
1996	91915	2163.1	2.4	1944.9	12.6	0.6	5072.4
1997	94543	2228.6	2.4	1982.6	12.7	0.6	5191.3
		Avg	**2.4**		**Avg**	**0.8**	

Note: Sectoral contribution to GSP from the BEA is available for the aggregate Public Utilities sector. The real gross product of electric utilities in Alabama is derived using the national electricity share of public utilities GDP and the national value added coefficient for electric utilities. *Source*: CBER, University of Alabama.

Table 8

Distribution of Customers in Alabama

	residential	*commercial*	*industrial*
APC	56%	60%	40%
co-ops	24%	19%	1%
municipals	19%	21%	59%
TVA	-	-	.08%
# of customers	1,882,604	275,516	13,334

	residential	*commercial*	*industrial*
APC	57%	82%	60%
co-ops	21%	7%	7%
municipals	23%	10%	20%
TVA	-	-	14%
Million mWh	25.6	13.3	33.5

Table 9

Electricity Distribution in Alabama, 1996

% each type of consumer
(% total electricity)

	APC	*Co-ops*	*Munis*	*TVA*	*mil mWh*
res	14.6 *57%*	5.1 *21%*	5.9 *23%*	-	25.6 *(35%)*
com	10.9 *82%*	0.9 *7%*	1.4 *10%*	-	13.3 *(18%)*
ind	20.0 *60%*	2.2 *7%*	6.6 *20%*	4.7 *14%*	33.5 *(46%)*
tot	45.5 *(63%)*	8.3 *(11%)*	13.9 *(19%)*	4.7 *(6%)*	72.5 *(100%)*

Table 10

Base Case: Steady Electricity Prices

		1995	1996	1997	1998	1999	2000	2001	2002	2003
Electricity Rev.s ($M)		3831	3913	3894	3976	4060	4146	4234	4325	4418
	Growth rate		2.1	-0.5	2.1	2.1	2.1	2.1	2.1	2.2
	Residential	1631	1700	1654	1676	1697	1719	1742	1764	1787
	Commercial	827	865	912	948	986	1026	1067	1110	1154
	Industrial	1332	1306	1287	1310	1334	1358	1382	1407	1432
	Other	41	42	41	42	42	43	44	44	45
Shares	Residential	0.43	0.43	0.42	0.42	0.42	0.41	0.41	0.41	0.40
	Commercial	0.22	0.22	0.23	0.24	0.24	0.25	0.25	0.26	0.26
	Industrial	0.35	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.32
	Other	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Share total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Price (cents per kWh)										
	Residential	6.71	6.63	6.73	*6.73*	*6.73*	*6.73*	*6.73*	*6.73*	*6.73*
	Commercial	6.73	6.49	6.46	*6.46*	*6.46*	*6.46*	*6.46*	*6.46*	*6.46*
	Industrial	4.06	3.90	3.77	*3.77*	*3.77*	*3.77*	*3.77*	*3.77*	*3.77*
	Other	7.31	6.77	7.56	*7.56*	*7.56*	*7.56*	*7.56*	*7.56*	*7.56*
Demand (million kWh)		70007	73104	73410	74918	76463	78048	79673	81339	83049
	Growth rate		4.4	0.4	2.1	2.1	2.1	2.1	2.1	2.1
	Residential	24314	25634	24586	24906	25229	25557	25890	26226	26567
	Commercial	12284	13328	14127	14692	15280	15891	16527	17188	17875
	Industrial	32847	33523	34155	34770	35396	36033	36681	37342	38014
	Other	561	620	542	550	558	567	575	584	593
Shares	Residential	0.35	0.35	0.33	0.33	0.33	0.33	0.32	0.32	0.32
	Commercial	0.18	0.18	0.19	0.20	0.20	0.20	0.21	0.21	0.22
	Industrial	0.47	0.46	0.47	0.46	0.46	0.46	0.46	0.46	0.46
	Other	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Share total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth rates	Residential		5.4	-4.1	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*	*1.3*
	Commercial		8.5	6.0	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*
	Industrial		2.1	1.9	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*	*1.8*
	Other		10.5	-12.6	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*

Source: Center for Business and Economic Research, University of Alabama; Energy Information Administration, *Electric Power Annual 1997*, Volume I, July 1998, DOE/EIA-0348(97)/1; and , *Electric Power Annual 1996*, Volume II, December 1997, DOE/EIA-0348(96)/2, U..S. Department of Energy.

Table 11

Base Case: Alabama Gross State Product, $million 1992

	1999	2000	2001	2002	2003
Total Real Gross State Product	99467	100882	103454	106697	109936
Manufacturing	23446.1	23587.9	24139.3	24963.0	25841.1
Nondurable Goods	11261.5	11301.2	11492.5	11736.0	12030.4
Food & Kindred Products	1047.8	1042.2	1075.1	1120.9	1166.1
Textile Mill Products	1782.5	1768.4	1782.3	1803.8	1832.4
Apparel & Other Textile Products	879.2	830.4	817.1	810.3	794.3
Paper & Allied Products	3087.9	3174.1	3258.0	3340.8	3426.0
Printing & Publishing	694.3	696.9	707.7	728.2	748.2
Chemicals & Allied Products	2062.2	2070.3	2119.1	2179.5	2277.6
Rubber & Misc Plastic Products	949.5	952.0	959.3	973.2	989.5
Other Nondurable Goods	765.1	771.0	790.9	811.4	833.3
Durable Goods	12184.8	12287.0	12647.0	13227.3	13810.9
Lumber & Wood Products	1712.2	1738.1	1779.5	1822.3	1859.9
Furniture & Fixtures	446.6	439.3	445.4	449.0	459.3
Primary Metal Industries	1641.5	1647.1	1672.5	1735.6	1788.4
Fabricated Metal Products	1407.5	1414.5	1441.9	1494.9	1543.7
Industrial Machinery & Equipment	2054.9	2089.7	2187.0	2299.8	2407.5
Electronic & Other Elec Equipment	2740.2	2755.6	2883.6	3154.8	3445.7
Motor Vehicles & Equipment	809.8	797.1	837.3	880.2	912.8
All Other Transportation Equipment	632.3	638.4	650.9	662.5	675.2
Stone, Clay, & Glass Products	572.1	576.7	592.4	613.7	636.1
Other Durable Goods	257.1	243.2	241.4	241.8	243.3
Mining	1708.5	1714.4	1722.0	1784.0	1830.0
Construction	4122.5	4206.8	4314.9	4401.6	4501.7
Wholesale and Retail Trade	17376.4	17587.8	18211.5	18941.7	19613.0
Services	15355.1	15761.2	16235.2	16908.4	17643.9
Finance, Insurance, & Real Estate	11634.0	11836.2	12132.5	12438.4	12721.1
Banking	2669.7	2733.1	2827.4	2939.9	3054.6
Nonbanking	8964.4	9103.1	9305.2	9498.5	9666.5
Transportation, Comm, Public Utilities	9455.4	9625.4	9853.6	10117.3	10368.3
Transportation	3012.3	3063.8	3142.9	3232.7	3315.0
Communications	2670.8	2711.7	2756.2	2821.8	2883.5
Public Utilities	3774.1	3851.0	3959.2	4071.7	4180.1
Electric Services	2369.1	2417.4	2485.3	2555.9	2623.9
Agr Serv, Forestry, Fisheries, Farming	1843.5	1865.9	1908.0	1943.7	1985.0
Government	14528.7	14698.7	14943.8	15211.7	15445.8
State & Local Government	8911.0	9018.2	9195.8	9391.1	9559.2
Federal Government	5617.7	5680.5	5748.0	5820.5	5886.6

Source: Center for Business and Economic Research, University of Alabama.

Table 12

Base Case: Alabama Total Employment (Thousands)

	1999	2000	2001	2002	2003
Total Wage & Salary Employment	2048.6	2060.1	2083.0	2114.6	2147.2
Manufacturing	379.6	374.7	371.8	375.7	380.0
Nondurable Goods	179.6	175.5	176.4	177.1	178.4
Food & Kindred Products	37.5	37.2	37.7	38.2	39.0
Textile Mill Products	39.4	38.9	39.2	39.1	39.0
Apparel & Other Textile Products	34.7	32.0	31.8	31.7	31.5
Paper & Allied Products	21.2	21.0	21.1	21.3	21.5
Printing & Publishing	15.6	15.6	15.7	15.9	16.1
Chemicals & Allied Products	12.0	11.9	12.0	12.2	12.3
Rubber & Miscellaneous Plastics Products	17.1	16.9	17.1	17.4	17.6
Other Nondurable Goods	2.2	2.2	2.2	2.2	2.2
Durable Goods	200.1	199.2	195.4	198.6	201.6
Lumber & Wood Products	39.9	39.9	40.6	41.3	41.9
Furniture & Fixtures	12.0	11.9	12.1	12.2	12.4
Primary Metal Industries	24.0	23.6	23.5	23.5	23.3
Fabricated Metal Products	22.8	22.6	22.9	23.1	23.4
Industrial Machinery & Equipment	32.2	32.3	32.8	34.1	35.2
Electronic & Other Electric Equipment	22.0	21.6	21.8	22.6	23.2
Motor Vehicles & Equipment	12.7	12.6	12.9	13.2	13.5
All Other Transportation Equipment	14.1	13.9	13.9	14.0	14.0
Stone, Clay, & Glass Products	9.7	9.7	9.8	9.8	9.9
Miscellaneous Manufacturing Industries	5.4	5.3	5.4	5.4	5.4
Mining	9.4	9.2	9.2	9.3	9.5
Construction	108.6	110.3	112.5	114.5	116.4
Wholesale & Retail Trade	448.6	453.6	461.6	468.3	474.9
Services	478.3	485.6	494.0	506.0	519.1
Finance, Insurance, & Real Estate	81.4	82.1	83.2	84.4	85.2
Banking	36.8	37.0	37.6	38.2	38.6
Nonbanking	44.6	45.1	45.6	46.2	46.6
Transp, Comm, Public Utilities	103.3	104.0	105.7	107.8	109.6
Transportation	64.0	64.4	66.1	68.2	69.7
Communications	21.9	22.1	22.2	22.4	22.7
Public Utilities	17.5	17.5	17.5	17.6	17.6
Electric Services	12.8	12.8	12.8	12.8	12.9
Agr Services, Forestry, Fisheries, Farming	23.6	23.2	23.2	23.2	23.3
Government	388.2	389.2	393.3	398.5	403.6
State & Local Government	292.8	294.9	298.5	302.6	306.7
Federal Government	95.3	94.3	94.8	95.9	96.9

Source: Center for Business and Economic Research, University of Alabama.

Table 13

Base Case: Electricity in Alabama Economy

Output

	1999	*2000*	*2001*	*2002*	*2003*
Total, million 1992 $	99467	100882	103454	106697	109935
Growth rate	2.1%	1.4%	2.6%	3.2%	3.1%
Electricity, mil 1992$	2369	2417	2485	2556	2624
Growth rate	2.7%	2.0%	2.8%	2.8%	2.8%
Share	2.4%	2.4%	2.4%	2.4%	2.4%

Employment

Total, thousands	2049	2060	2083	2115	2147
Growth rate	0.8%	0.4%	1.6%	2.0%	1.7%
Electricity, thousands	12.8	12.8	12.8	12.8	12.9
Growth rate	0.3%	0.2%	0.3%	0.3%	0.3%
Share	0.6	0.6	0.6	0.6	0.6

Table 14

Wholesale Competition Model Summary

	1998	1999	2000	2001	2002	2003
Elasticity **-0.56**						
Base price, $/kWh	$.053	$.053	$.053	$.053	$.053	$.053
Base demand, mil kWh	74,918	76,463	78,048	79,673	81,339	83,049
Base electricity rev, $mil	3976	4060	4146	4234	4325	4418
Competitive 2003 price						$.0515
Competitive Price	$.0530	$.0527	$.0524	$.0521	$.0518	$.0515
% change from base		-0.6%	-1.2%	-1.8%	-2.3%	-2.9%
Demand, mil kWh		76,716	78,561	80,457	82,404	84,403
% change		0.3%	0.7%	1.0%	1.3%	1.6%
Electricity revenue, $mil		4045	4118	4193	4269	4347
% change		-0.4%	-.7%	-1.0%	-1.3%	-1.6%
Change in consumer surplus, $mil		*$23.9*	*$48.8*	*$74.6*	*$101.5*	*$129.3*

Table 15

Wholesale Competition: Gross State Product Impacts

	1999	2000	2001	2002	2003

Base Case

	1999	2000	2001	2002	2003
Total, million 1992 $	99467	100882	103454	106697	109935
Growth rate	2.1%	1.4%	2.6%	3.2%	3.1%
Electricity sales, mil 1992 $	2369.1	2417.4	2485.3	2555.9	2623.9
Growth rate	2.7%	2.0%	2.8%	2.8%	2.8%
Share	2.4	2.4	2.4	2.4	2.4

Wholesale Competition

	1999	2000	2001	2002	2003
Total, million 1992 $	99479	100901	103489	106746	109997
Growth Rate	2.1%	1.4%	3.0%	3.0%	3.0%
Electricity sales, mil 992 $	2361.3	2402.6	2462.7	2525.1	2584.5
Growth Rate	2.3%	1.7%	2.5%	2.5%	2.4%
Share	2.4	2.4	2.4	2.4	2.3

Absolute Change

	1999	2000	2001	2002	2003
Total, million 1992 $	11.6	18.6	35.6	48.6	61.5
Electricity sales, mil 1992 $	-7.71	-14.8	-22.6	-30.8	-39.4

Percentage Change

	1999	2000	2001	2002	2003
Total	0.01%	0.02%	0.34%	0.16%	0.05%
Electricity Services	-0.33%	-0.61%	-0.98%	-1.21%	-1.50%

Table 16

Wholesale Competition: Sensitivity Analysis

	1998	1999	2000	2001	2002	2003
Base Price (cents per kWh)	5.30	5.30	5.30	5.30	5.30	5.30
Base Demand (million kWh)	74918	76463	78048	79673	81339	83049
Base Electricity Rev.s ($M)	3976	4060	4146	4234	4325	4418
Base Total GSP ($M)*	97468.9	99467.1	100882.1	103453.9	106697.2	109935.5
Base Electricity Gross Product ($M)*	2307.8	2369.1	2417.4	2485.3	2555.9	2623.9

Elasticity -0.56

Expected 2003 price (cents per kWh)						5.15
Price (cents per kWh)	5.30	5.27	5.24	5.21	5.18	5.15
Demand (million kWh)		76715.5	78561.4	80456.9	82403.5	84402.9
Electricity Rev.s ($M)		4045	4118	4193	4269	4347
CHANGE IN CONSUMER SURPLUS ($M)		23.94	48.8	74.6	101.5	129.3
Change in Total GSP ($M)*		11.6	18.6	35.6	48.5	61.5

Elasticity -0.88

Expected 2003 price (cents per kWh)						5.15
Price (cents per kWh)	5.30	5.27	5.24	5.21	5.18	5.15
Demand (million kWh)		76859.7	78854.9	80905.0	83011.6	85176.7
Electricity Rev.s ($M)		4053	4134	4234	4325	4418
CHANGE IN CONSUMER SURPLUS ($M)		23.96	48.9	74.8	101.8	129.9
Change in Total GSP ($M)*		28.5	37.7	57.7	79.0	99.8

Elasticity -0.08

Expected 2003 price (cents per kWh)						5.15
Price (cents per kWh)	5.30	5.27	5.24	5.21	5.18	5.15
Demand (million kWh)		76499.7	78122.2	79786.4	81493.5	83244.8
Electricity Rev.s ($M)		4034	4095	4158	4222	4287
CHANGE IN CONSUMER SURPLUS ($M)		23.91	48.67	74.32	100.90	128.42
Change in Total GSP ($M)*		0.1	1.7	2.6	3.6	4.3

PRICE CHANGE EFFECT

Elasticity -0.56

Expected 2003 price (cents per kWh)						5.10
Price (cents per kWh)	5.30	5.26	5.22	5.18	5.14	5.10
Demand (million kWh)		76798.5	78729.7	80712.8	82749.4	84841.3
Electricity Rev.s ($M)		4042	4111	4182	4254	4327
CHANGE IN CONSUMER SURPLUS ($M)		31.83	64.9	99.1	134.7	171.6
Change in Total GSP ($M)*		15.2	32.9	48.2	67.1	85.5

* In 1992 dollars.

Table 17

Regional Electricity Prices, 1997

(% US average price)

res	com	ind	avg	
AL	$.067	$.065	$.038	$.053
	78%	*86%*	*83%*	*77%*
TN	$.060	$.061	$.043	$.053
	71%	*80%*	*93%*	*77%*
MS	$.071	$.067	$.042	$.059
	84%	*88%*	*91%*	*86%*
FL	$.081	$.067	$.052	$.073
	95%	*88%*	*113%*	*84%*
GA	$.078	$.071	$.042	$.064
	92%	*93%*	*91%*	*93%*
KY	$.056	$.052	$.029	$.047
	66%	*68%*	*63%*	*68%*
US	$.085	$.076	$.046	$.069

Table 18

Retail Competition: Impacts and Sensitivities

	1998	1999	2000	2001	2002	2003
Base Price (cents per kWh)	5.30	5.30	5.30	5.30	5.30	5.30
Base Demand (million kWh)	74918	76463	78048	79673	81339	83049
Base Electricity Rev.s ($M)	3976	4060	4146	4234	4325	4418
Base Total GSP ($M)	97468.9	99467.1	100882.1	103453.9	106697.2	109935.5
Base Electricity Gross Product ($M)	2307.8	2369.1	2417.4	2485.3	2555.9	2623.9
Elasticity **-0.56**						
Expected 2003 price (cents per kWh)						5.60
Price (cents per kWh)	5.30	5.8	5.75	5.70	5.65	5.60
Demand (million kWh)		72463.0	74382.2	76353.2	78377.7	80457.5
Electricity Rev.s ($M)		4203	4276	4351	4428	4506
CHANGE IN CONSUMER SURPLUS ($M)		-369.0	-339.1	-307.9	-275.4	-241.6
Change in Total GSP ($M)		-245.2	-225	-205.6	-186.8	-165.9
Elasticity **-0.88**						
Expected 2003 price (cents per kWh)						5.60
Price (cents per kWh)	5.30	5.8	5.75	5.70	5.65	5.60
Demand (million kWh)		70177.1	72287.5	74456.3	76685.4	78976.8
Electricity Rev.s ($M)		4070	4156	4243	4332	4423
CHANGE IN CONSUMER SURPLUS ($M)		-363.3	-334.4	-304.1	-272.5	-239.4
Change in Total GSP ($M)		-353.4	-324.8	-299.8	-266.0	-235.2
Elasticity **-0.08**						
Expected 2003 price (cents per kWh)						5.60
Price (cents per kWh)	5.30	5.8	5.75	5.70	5.65	5.60
Demand (million kWh)		75883.8	77516.9	79192.0	80910.4	82673.4
Electricity Rev.s ($M)		4401	4457	4513	4571	4630
CHANGE IN CONSUMER SURPLUS ($M)		-377.5	-346.0	-313.5	-279.8	-244.9
Change in Total GSP ($M)		-59.5	-59.0	-52.7	-48.5	-46.3
PRICE CHANGE EFFECT						
Elasticity **-0.56**						
Expected 2003 price (cents per kWh)						5.60
Price (cents per kWh)	5.30	5.75	5.71	5.67	5.64	5.60
Demand (million kWh)		72866.6	74688.8	76560.3	78482.6	80457.5
Electricity Rev.s ($M)		4190	4266	4344	4424	4506
CHANGE IN CONSUMER SURPLUS ($M)		-332.7	-311.3	-289.1	265.8	-241.6
Change in Total GSP ($M)		-211.5	-199.2	-186.2	-172.5	-159.2

In 1992 dollars.

Table 24

Share of Total Tax Revenue for Some Tax Components (%)

Tax	INCOME TAXES	Corporate Income	Individual Income	SALES TAX	UTILITY TAXES Utility Receipts	Utility License	TVA	Corporate Franchise	Hydro Electric
1984	38.28	8.22	30.07	26.70	5.73	2.08	1.39	2.44	0.05
1985	39.13	7.35	31.78	26.34	5.63	1.98	1.55	2.52	0.05
1986	38.62	5.48	33.14	27.25	5.63	1.97	1.59	2.64	0.03
1987	40.92	5.38	35.54	26.54	5.44	1.88	1.55	2.79	0.02
1988	40.71	5.68	35.03	26.53	5.37	1.86	1.65	2.56	0.03
1989	42.32	6.22	36.10	25.93	5.02	1.75	1.58	2.32	0.02
1990	41.59	5.00	36.59	26.11	5.26	1.71	1.52	2.67	0.05
1991	41.40	4.63	36.77	25.38	4.91	1.71	1.57	2.88	0.04
1992	37.89	4.13	33.77	23.55	4.64	1.55	1.34	2.78	0.03
1993	39.44	4.36	35.07	24.56	5.26	1.54	1.29	2.34	0.03
1994	39.58	4.43	35.15	25.24	5.02	1.54	1.31	2.26	0.03
1995	40.38	4.75	35.63	25.38	4.89	1.50	1.28	2.65	0.03
1996	41.36	4.33	37.03	25.93	5.08	1.46	1.26	2.28	0.03
1997	42.80	4.59	38.20	26.02	5.01	1.46	1.27	2.20	0.03
Avg	**40.32**	**5.32**	**34.99**	**25.82**	**5.21**	**1.71**	**1.44**	**2.52**	**0.03**

Table 25
Electric Utility Tax History

	Total Tax Revenues $mil	TVA $mil	Utility Receipt Tax $mil	Utility License Tax $mil	Total Utility Tax $mil	Utility Share of Tax Rev
1978	1477.7	19.7	80.0	25.9	125.5	8.5%
1979	1646.1	25.9	94.0	28.6	148.5	9.0%
1980	1786.8	25.6	111.6	33.2	170.3	9.5%
1981	2081.2	29.3	123.8	39.5	192.6	9.3%
1982	2112.3	36.0	134.6	44.1	214.7	10.2%
1983	2288.2	31.3	152.3	46.2	229.8	10.0%
1984	2637.8	36.7	151.3	54.8	242.8	9.2%
1985	2772.6	42.8	156.2	55.0	254.0	9.2%
1986	2846.8	45.3	160.2	56.1	261.7	9.2%
1987	3053.0	47.4	166.0	57.4	270.7	8.9%
1988	3184.0	52.5	171.0	59.2	282.7	8.9%
1989	3455.8	54.5	173.6	60.5	288.6	8.4%
1990	3625.1	55.2	190.7	61.9	307.8	8.5%
1991	3764.4	59.0	184.9	64.4	308.3	8.2%
1992	4319.5	57.7	200.6	66.8	325.1	7.5%
1993	4451.2	57.4	234.4	68.4	360.1	8.1%
1994	4633.2	60.8	232.4	71.5	364.7	7.9%
1995	4895.7	62.6	239.4	73.5	375.4	7.7%
1996	5072.4	64.1	257.9	74.0	396.0	7.8%
1997	5191.3	66.1	260.0	75.8	402.0	7.7%
					Average	**8.7%**

Source: Center for Business and Economic Research, University of Alabama.

Table 27

Residential Electricity Prices in Alabama, 1996

CO-OPS

Arab	$.062
Baldwin County	$.068
Black Warrior	$.064
Central Alabama	$.070
Cherokee	$.070
Clark-Washington	$.077
Coosa Valley	$.079
Covington	$.077
Cullman	$.065
Dixie	$.074
Franklin	$.073
Joe Wheeler	$.068
Marshall-Dekalb	$.062
North Alabama	$.061
Pea River	$.071
Pioneer	$.085
Sand Mountain	$.068
South Alabama	$.078
Southern Pine	$.065
Tallapoosa	$.079
Tombigbee	$.069
Troup	$.082
Wiregrass	$.071

APC	$.068
ALABAMA AVERAGE	$.066

Table 19

Continued Wholesale Competition: Alabama GSP ($mil, 1992)

	1999	2000	2001	2002	2003
Total Real Gross State Product	99478.7	100901	103490	106746	109997
Manufacturing	23451.9	23593.7	24154.7	24984.3	25868.3
Nondurable Goods	11264.4	11306.9	11501.2	11747.8	12045.4
Food & Kindred Products	1048.0	1042.7	1075.9	1122.0	1167.4
Textile Mill Products	1782.9	1769.2	1784.7	1805.7	1834.7
Apparel & Other Textile Products	879.4	830.8	818.3	811.3	795.3
Paper & Allied Products	3088.6	3175.6	3260.3	3344.0	3430.0
Printing & Publishing	694.5	697.3	708.2	728.9	749.1
Chemicals & Allied Products	2062.7	2071.4	2121.1	2181.6	2280.3
Rubber & Miscellaneous Plastic Products	949.7	952.4	960.0	974.1	990.6
Other Nondurable Goods	765.3	771.4	791.5	812.2	834.3
Durable Goods	12187.7	12287.1	12653.8	13236.8	13823.1
Lumber & Wood Products	1712.6	1738.9	1781.2	1824.1	1862.1
Furniture & Fixtures	446.7	439.5	446.0	449.5	459.9
Primary Metal Industries	1641.5	1647.1	1672.5	1735.6	1788.4
Fabricated Metal Products	1408.5	1415.9	1443.3	1496.4	1545.5
Industrial Machinery & Equipment	2055.5	2085.8	2188.7	2302.2	2410.7
Electronic & Other Electric Equipment	2740.8	2756.9	2885.7	3157.9	3449.7
Motor Vehicles & Equipment	810.0	797.5	838.5	881.1	913.9
All Other Transportation Equipment	632.4	638.7	651.3	663.1	676.0
Stone, Clay, & Glass Products	572.2	576.9	592.9	614.4	636.9
Other Durable Goods	257.2	243.3	242.1	242.1	243.5
Mining	1708.9	1715.3	1724.0	1785.9	1832.3
Construction	4123.5	4208.9	4318.1	4405.7	4507.0
Wholesale & Retail Trade	17381.0	17597.0	18226.1	18961.9	19638.8
Services	15358.7	15768.8	16246.9	16924.4	17664.6
Finance, Insurance, & Real Estate	11636.8	11842.0	12141.3	12450.3	12736.1
Banking	2670.3	2734.4	2829.4	2942.8	3058.2
Nonbanking	8966.5	9107.5	9311.9	9507.6	9677.8
Transp, Comm, & Public Utilities	9444.5	9604.6	9822.0	10074.1	10312.9
Transportation	3013.0	3065.2	3145.7	3235.9	3318.9
Communications	2671.5	2713.0	2758.2	2824.5	2886.9
Public Utilities	3761.8	3827.5	3923.3	4022.6	4117.3
Electric Services	2361.4	2402.6	2462.7	2525.1	2584.5
Agr Serv, Forestry, Fisheries, & Farming	1844.0	1866.8	1909.3	1945.5	1987.3
Government	14532.6	14705.8	14954.6	15226.1	15463.9
State & Local Government	8913.6	9022.6	9202.5	9400.1	9570.5
Federal Government	5619.0	5683.3	5752.2	5826.0	5893.5

Source: Center for Business and Economic Research, University of Alabama.

Table 20

Continued Wholesale Competition: Employment (000s)

	1999	2000	2001	2002	2003
Total Wage & Salary Employment	2048.7	2060.3	2083.3	2115.1	2147.8
Manufacturing	379.7	374.7	371.8	375.8	380.1
Nondurable Goods	179.6	175.6	176.4	177.2	178.5
Food & Kindred Products	37.5	37.2	37.7	38.2	39.0
Textile Mill Products	39.4	38.9	39.2	39.1	39.0
Apparel & Other Textile Products	34.8	32.0	31.9	31.8	31.5
Paper & Allied Products	21.2	21.0	21.1	21.3	21.5
Printing & Publishing	15.6	15.6	15.7	15.9	16.1
Chemicals & Allied Products	12.0	11.9	12.0	12.2	12.3
Rubber & Miscellaneous Plastic Products	17.1	16.9	17.1	17.4	17.6
Other Nondurable Goods	2.2	2.2	2.2	2.2	2.2
Durable Goods	200.1	199.2	195.4	198.7	201.6
Lumber & Wood Products	39.9	39.9	40.6	41.3	41.9
Furniture & Fixtures	12.0	11.9	12.1	12.2	12.4
Primary Metal Industries	24.0	23.6	23.5	23.5	23.3
Fabricated Metal Products	22.8	22.6	22.9	23.1	23.4
Industrial Machinery & Equipment	32.2	32.2	32.8	34.1	35.3
Electronic & Other Electric Equipment	22.0	21.6	21.9	22.6	23.2
Motor Vehicles & Equipment	12.7	12.6	12.9	13.2	13.5
All Other Transportation Equipment	14.1	13.9	13.9	14.0	14.1
Stone, Clay, & Glass Products	9.7	9.7	9.8	9.8	9.9
Other Durable Goods	5.4	5.3	5.4	5.4	5.4
Mining	9.4	9.2	9.2	9.3	9.5
Construction	108.6	110.4	112.6	114.5	116.5
Wholesale & Retail Trade	448.7	453.7	461.6	468.4	475.0
Services	478.4	485.7	494.2	506.3	519.4
Finance, Insurance, & Real Estate	81.4	82.1	83.2	84.4	85.2
Banking	36.8	37.0	37.6	38.2	38.6
Nonbanking	44.6	45.1	45.6	46.2	46.6
Transp, Comm, Public Utilities	103.3	103.9	105.7	107.7	109.5
Transportation	64.0	64.4	66.2	68.2	69.7
Communications	21.9	22.1	22.2	22.4	22.7
Public Utilities	17.5	17.5	17.5	17.5	17.6
Electric Services	12.7	12.8	12.8	12.8	12.8
Agr Services, Forestry, Fisheries, Farming	23.6	23.2	23.2	23.2	23.3
Government	388.2	389.2	393.3	398.5	403.6
State & Local Government	292.8	294.9	298.5	302.6	306.7
Federal Government	95.3	94.3	94.8	95.9	96.9

Source: Center for Business and Economic Research, University of Alabama.

Table 21

Retail Competition: Alabama Gross State Product ($mil, 1992)

	1999	2000	2001	2002	2003
Total Real Gross State Product	99222	100657	103248	106510	109770
Manufacturing	23357.7	23509.0	24067.2	24897.4	25784.1
Nondurable Goods	11216.6	11261.1	11456.4	11703.4	12001.5
Food & Kindred Products	1043.7	1038.8	1072.0	1117.9	1163.4
Textile Mill Products	1771.0	1758.9	1766.9	1781.0	1807.7
Apparel & Other Textile Products	873.5	826.1	809.7	799.3	782.5
Paper & Allied Products	3076.4	3163.6	3248.5	3332.3	3418.5
Printing & Publishing	691.7	694.6	705.5	726.3	746.5
Chemicals & Allied Products	2052.5	2061.9	2109.0	2166.9	2264.3
Rubber & Miscellaneous Plastic Products	945.8	948.9	956.5	970.8	987.3
Other Nondurable Goods	762.1	768.3	788.4	809.2	831.3
Durable Goods	12141.3	12248.1	12611.0	13194.2	13782.2
Lumber & Wood Products	1704.3	1731.2	1770.8	1811.4	1848.7
Furniture & Fixtures	444.2	437.3	442.2	444.4	454.2
Primary Metal Industries	1635.0	1641.5	1667.1	1730.3	1783.6
Fabricated Metal Products	1400.9	1408.8	1434.7	1485.8	1534.3
Industrial Machinery & Equipment	2046.1	2081.6	2179.5	2292.8	2401.7
Electronic & Other Electric Equipment	2729.8	2746.4	2875.0	3146.5	3438.2
Motor Vehicles & Equipment	804.6	792.8	830.1	869.4	901.0
All Other Transportation Equipment	630.0	636.3	649.0	660.9	673.7
Stone, Clay, & Glass Products	569.4	574.3	589.6	610.5	632.8
Other Durable Goods	253.7	241.0	236.1	232.9	233.1
Mining	1698.8	1706.3	1709.6	1766.6	1811.2
Construction	4107.4	4192.6	4302.0	4390.3	4491.8
Wholesale & Retail Trade	17303.3	17521.0	18149.6	18885.6	19561.9
Services	15298.2	15708.3	16186.9	16864.9	17605.3
Finance, Insurance, & Real Estate	11590.9	11796.6	12096.5	12406.2	12693.0
Banking	2659.7	2724.0	2819.0	2932.2	3047.8
Nonbanking	8931.2	9072.6	9277.5	9474.0	9645.2
Transp, Comm, & Public Utilities	9553.0	9713.9	9933.5	10187.5	10427.4
Transportation	2998.7	3051.9	3128.4	3215.0	3296.8
Communications	2660.9	2702.5	2747.9	2814.7	2877.2
Public Utilities	3893.4	3959.5	4057.2	4157.7	4253.3
Electric Services	2444.0	2485.5	2546.8	2609.9	2669.9
Agricultural, Forestry, Fisheries, Farming	1836.5	1859.8	1902.4	1938.7	1980.6
Government	14474.8	14649.6	14899.4	15172.3	15411.8
State & Local Government	8877.8	8988.0	9168.4	9366.9	9538.2
Federal Government	5597.0	5661.5	5730.9	5805.4	5873.6

Source: Center for Business and Economic Research, University of Alabama.

Table 22

Retail Competition: Alabama Total Employment (000s)

	1999	2000	2001	2002	2003
Total Wage & Salary Employment	2046.8	2058.4	2081.5	2113.3	2146.0
Manufacturing	379.3	374.4	371.4	375.5	379.7
Nondurable Goods	179.4	175.4	176.2	177.0	178.3
Food & Kindred Products	37.4	37.2	37.5	38.0	38.7
Textile Mill Products	39.2	38.7	38.9	38.5	38.4
Apparel & Other Textile Products	34.7	32.0	31.7	31.6	31.3
Paper & Allied Products	21.2	21.0	21.1	21.3	21.5
Printing & Publishing	15.6	15.6	15.7	15.9	16.1
Chemicals & Allied Products	12.0	11.9	12.0	12.2	12.3
Rubber & Miscellaneous Plastic Products	17.1	16.8	17.0	17.3	17.6
Other Nondurable Goods	2.2	2.2	2.2	2.2	2.2
Durable Goods	199.9	199.0	195.2	198.5	201.5
Lumber & Wood Products	39.9	39.9	40.5	41.1	41.8
Furniture & Fixtures	11.9	11.8	12.0	12.1	12.4
Primary Metal Industries	23.9	23.5	23.4	23.3	23.0
Fabricated Metal Products	22.8	22.6	22.9	23.1	23.4
Industrial Machinery & Equipment	32.1	32.2	32.7	34.0	35.2
Electronic & Other Electric Equipment	21.9	21.5	21.8	22.4	23.0
Motor Vehicles & Equipment	12.6	12.6	12.8	13.0	13.4
All Other Transportation Equipment	14.0	13.9	13.9	13.9	14.0
Stone, Clay, & Glass Products	9.7	9.7	9.7	9.8	9.9
Other Durable Goods	5.4	5.3	5.4	5.4	5.4
Mining	9.4	9.2	9.2	9.3	9.5
Construction	108.4	110.1	112.3	114.1	116.1
Wholesale & Retail Trade	448.5	453.5	461.5	468.2	474.8
Services	477.3	484.6	493.1	505.2	518.4
Finance, Insurance, & Real Estate	81.3	82.0	83.0	84.1	84.9
Banking	36.7	37.0	37.5	38.0	38.5
Nonbanking	44.6	45.1	45.5	46.1	46.4
Transp, Comm, & Public Utilities	103.3	104.0	105.7	107.8	109.6
Transportation	63.9	64.3	65.9	67.7	69.2
Communications	21.9	22.1	22.2	22.4	22.6
Public Utilities	17.6	17.6	17.6	17.7	17.7
Electric Services	12.8	12.8	12.9	12.9	12.9
Agr Services, Forestry, Fisheries, Farming	23.6	23.2	23.3	23.3	23.4
Government	388.1	389.2	393.3	398.5	403.6
State & Local Government	292.8	294.9	298.5	302.6	306.7
Federal Government	95.3	94.3	94.8	95.9	96.9

Source: Center for Business and Economic Research, University of Alabama.

Table 23

Retail Competition versus Continued Wholesale Competition

	2003
Total Real Gross State Product	***-0.2%***
Manufacturing	-0.3%
Nondurable Goods	-0.4%
Food & Kindred Products	-0.3%
Textile Mill Products	**-1.5%**
Apparel & Other Textile Products	-0.2%
Paper & Allied Products	-0.3%
Printing & Publishing	-0.3%
Chemicals & Allied Products	-0.7%
Rubber & Miscellaneous Plastic Products	-.04%
Other Nondurable Goods	-0.4%
Durable Goods	-0.3%
Lumber & Wood Products	-0.7%
Furniture & Fixtures	**-1.3%**
Primary Metal Industries	-.3%
Fabricated Metal Products	-0.8%
Industrial Machinery & Equipment	-0.4%
Electronic & Other Electric Equipment	-0.3%
Motor Vehicles & Equipment	**-1.4%**
All Other Transportation Equipment	-0.3%
Stone, Clay, & Glass Products	-0.6%
Other Durable Goods	**-4.5%**
Mining	**-1.2%**
Construction	-0.3%
Wholesale & Retail Trade	-0.4%
Services	-0.3%
Finance, Insurance, & Real Estate	-0.3%
Banking	-0.3%
Nonbanking	-0.3%
Transp, Comm, & Public Utilities	1.1%
Transportation	-0.6%
Communications	-0.3%
Public Utilities	**3.3%**
Electric Services	**3.3%**
Agr Services, Forestry, Fisheries, Farming	-0.3%
Government	-0.3%
State & Local Government	-0.3%