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AN ECONOMIC STUDY OF COAL MINE
TAXATION IN UTAH

by
A. LeMar Hendrickson

A thesis submitted in partial fulfillment of the requirements
for the degree of
Master of Science
in the
School of Commerce

Utah State Agricultural College

1941



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WESTERN BOND

AN ECONOMIC STUDY OF COAL MINE TAXATION IN UTAH

INTRODUCTION

A discussion of the subject of coal mine taxation seems timely and should be of much practical interest in view of the present depressed condition in which the coal industry finds itself. Coal production has developed into one of Utah's most important industries from the standpoint of quantity, value, and associated employment. It has become vital to the economic stability and security of the state. Coal producers, however, have encountered serious economic difficulties during the past two decades. The task of building up profitable industrial activities is one thing, the job of protecting and maintaining them is another matter.

Not only has the industry failed to continue the progress of the War and pre-War period, but it has lost much of the market which had been developed. Shrinking demand, decreasing production, rising costs and falling prices have practically wiped out profits.¹ Laborers and their families, people who have depended on the coal industry for their prosperity and existence for years, have found themselves unemployed and without incomes. The productive capacity of mines

¹ On each ton of coal produced in the United States in 1936, the producer lost 11 cents. Time, December 27, 1937. A combined deficit of approximately \$2,500,000 was incurred by Utah mining companies during the few years preceding 1936. Investigating Committee of Utah Governmental Units, An Economic Study of the Development of Utah's Coal Industry, p. 51.

has been more than double the consumption needs of this area. Consequently, a considerable portion of the 40 million dollars² which has been invested in coal mining equipment has become a millstone on the neck of the industry. Indeed, coal has become news--labor news, price news, bankruptcy news.

But because the coal industry is threatened with economic chaos, it must not be assumed that its tax is at fault. The coal problem is national in scope. The people of Utah cannot hope to uncover a panacea applicable to this state alone. Utah long since ceased to be a separate and distinct economic unit. Those economic and political factors that affect industries in other states, likewise tend to exert a similar influence upon corresponding industries in this state.

Notwithstanding this fact, coal taxes amount to a considerable portion of the cost of operations. They undoubtedly have a significant influence on the economic status of the industry. Mine operators contend that the present tax is both excessive and discriminatory, but this claim is not unnatural. No taxpayer ever denies that he ought to pay his fair share of the expenses of government; what he loudly and sometimes violently asserts is that the tax imposed on him is more than his fair share, while other people oftentimes are equally forceful in asserting that what he pays is less than his fair share. What makes the contention of the operators significant, however, is the fact that the whole trend

² Salt Lake Tribune, January 30, 1938, p. 52.

of mining activity has changed since the tax was adopted in 1919. The mine owners point out that all of the factors which were weighted heaviest in originally determining ton-values have changed to such an extent that they are not applicable now. On the basis of these changes, the mining companies have appealed for tax reductions, and they have also requested that tax discriminations between competing fuels be eliminated.

How much justification there is to these claims and appeals is not known. A detailed study of the problem has not been made, although economic conditions give it sufficient importance to justify some serious consideration. Coal production is too important to the welfare of Utah to have its problems ignored. If tax injustices are contributing to the economic distress of the coal industry, action should be promptly taken to remedy the situation. On the other hand, if the tax levied on coal mining property is not unjust, the loud and earnest assertions of the coal operators could be dismissed with the comforting assurance that coal mines are being fairly treated.

However, the fact must not be ignored that each tax is a regulatory tax. A pure tax (one that produces revenue without in any way altering the economic order) is an ideal of fiscal theorists. No tax has yet been devised that does not in itself result in minor or major economic changes. Whenever a tax on business, consumption, or property is not truly general and uniform, it discriminates between economic

elements, and modifies the economic order. A gasoline tax which adds four or five cents to the price of motor fuel has a repressive effect on the oil industry. A heavy fixed-sum license tax on a class of retail stores may force some stores out of business altogether and may bring profits to others in excess of the tax they pay. Likewise, a tax on coal which adds several cents to the cost of producing each ton may reduce coal production and stimulate demand for other products. If the tax on all property is not uniform in its effect, some property is being given preferential treatment and other property is being handicapped by discrimination.

Since taxes can make a fairly profitable mine worthless and a very profitable mine worth less than it was before, the problem of analyzing the effect of coal mine taxes on the industry under present economic conditions seems appropriate. In this study we shall "look and see" what has actually happened to the ad valorem property tax which was imposed on the Utah coal industry 22 years ago. The industry has been in motion, changes have taken place; but, what about its tax?

Although there are other interesting coal mine taxes, we can do little more than recognize them in this study. In analyzing the property tax, our investigation will be limited to the following five topics: (1) the method employed in taxing Utah coal mines; (2) the economic characteristics of the industry; (3) the effect of economic changes on the tax

burden; (4) the regulatory aspects of the tax; and (5) some comparisons of tax uniformity.

It would be more than one might expect, that such inquiries could be answered in absolute terms. In economic analysis it is seldom possible to arrive at more than tendencies and approximations. Even these points, if analyzed completely, could result in a voluminous report. The data contained in this study, therefore, will be carefully selected and tersely stated.

TAXATION PROCEDURE FOR UTAH COAL MINES

The taxation of mines is perhaps the most difficult problem to solve to the satisfaction of all concerned in the whole field of taxation. Not only is it a subject of continual discussion in Utah, but the experience in this state seems to be no different from that of many other states where mining is of considerable importance. This continuous discussion arises partly from certain peculiar features of the industry, and partly from the fact that mines are usually given special tax treatment. It is difficult to fit mine taxation into any system of general business taxation. Producing mineral properties differ from other properties in that their value suffers continuous depletion as the mineral deposits on which that value is based are removed from the earth. Mineral wealth, for this reason, is usually classified separately for taxation purposes in most states.

Types of mine taxation. Some states have exercised considerable originality in formulating methods of taxing mines, but a few standard types stand out. A number of states employ the ad valorem system of taxation. This procedure requires that an assessed value be placed on the property of each mining company, including the mineral deposits, in the same manner that a public utility or a farm is assessed. To this assessment the local and state mill rates are applied to determine the taxes to be paid. Some of the states base mine taxes on net proceeds. Other states determine their

mineral taxes from gross proceeds, while an increasing number are applying some type of severance tax either in lieu of other tax methods or as a supplement to other forms.

Assessment of Utah coal mines. Utah adopted the ad valorem method of assessing coal mines in 1919. Prior to that time, they were taxed on the same basis as other mining property. In addition to an ad valorem assessment on surface rights, improvements, and equipment, a tax was levied on the net proceeds of mining operations. In 1919, however, the Legislature of Utah provided for taxation of coal deposits according to a given formula to be used in arriving at assessed valuation. The surface taxes and the ad valorem assessment on machinery and equipment were maintained.

Assessment problems. The task of assessing coal mines was delegated to the State Board of Equalization and Assessment. This commission was no small assignment, since the taxation of mines presents many problems that require special treatment. Any careful study of taxation will reveal that the problem of just and satisfactory assessments is an extremely difficult one, but it is generally admitted that its application to mines presents difficulties that may not be present in other types of enterprises. In the case of land, yields over a period of years will ordinarily demonstrate economic factors involved in production. For public utilities, factories, and machinery, facts relative to costs of construction are usually available. These provide at least a foundation for placing tax estimates on this type of property.

The problems involved in assessing mineral deposits for ad valorem taxation are much more complicated.

In the first place, a sound base on which to levy the tax had to be determined. Coal appears on the surface only at occasional outcrops. The great body of the resource is completely hidden from sight. Yet, if coal is to serve as a tax base, the extent of the deposits should be readily ascertainable. In order to provide this information, an extensive survey was required. In conformance with the Act of 1919, all coal land was divided into 40-acre tracts. Each of these legal subdivisions was a unit of assessment, and the report of the survey of each included data on the number of seams the property contained, the thickness and relative position of each seam, and the available tonnage.

Some tests of quality were also requisite to the fair assessment of coal deposits. This problem was not difficult where the coal beds were uniform in thickness and substance. In Utah, however, there were several varieties of coal, and the value of each was different. It was important, therefore, that the description of each property included some data on the ash, water, sulphur, and fixed carbon content of the coal.

Naturally, these were no problems for a county assessor; they were a real challenge for trained technicians. Some states have not taken this fact into consideration, and consequently they have been experiencing difficulty with the ad valorem method. In Utah the complete geological survey

was made in the beginning. About two years were required to complete this work; but when the final reports were filed with the State Board of Equalization, a comprehensive record covering actual measurements of more than 100 billion tons of Utah coal was available as a base for assessment.¹ Undoubtedly much of the success which Utah has had with the ad valorem method can be attributed to this fact.

After the actual tonnage of each 40-acre tract had been computed, it next became the object of the survey to decide upon a fair ton-value for the coal. This ton-value was to be the deciding factor on land values; and it was desired to fix a price which would be consistent in maintaining a fairness to the property holders and at the same time guarantee a fair return to the state. In keeping with this policy, several meetings were held by the Board, with representatives from practically all the operating and non-operating coal property holders in the state in attendance. The result of these conferences was the adoption of a schedule which divided the coal land of Utah into nine classes and fixed ton-values for each.

In classifying and valuing coal property, several difficult problems in mineral economics had to be solved. These were just as technical as those which faced the geologists, and their solution was just as important in making possible a satisfactory taxing procedure.

For most types of property the entire amount is utilized

¹ State Board of Equalization and Assessment, Thirteenth Biennial Report, p. 14.

in production, but only a part of mineral deposits can ever be utilized in production at one time. The farmer cultivates all his land, and the whole area is therefore assessed. With a mine it is different; that part which cannot possibly be reached for ten years is in quite a different status from the coal lying a foot ahead of the working face. Minerals in reserve have a deferred value. Frequently this turns out to be a rather doubtful value. If the coal that can be mined this year has a present worth of \$100,000, an identical quantity which cannot be mined for ten years has a value of \$62,000, if the rate of interest is 5 percent, and the price remains the same. Coal which will not be mined for many years has a small present value.

If the tax is based on an annual production rate of 4,500,000 tons, and the output falls to three million tons per year; coal that would have been extracted ten years hence will have to wait 15 years for production. Not only does this increase the tax which each of the three million tons of coal will be required to carry, but it also extends the time that the current production will have to assume this increased load. Time and extraction data were significant, therefore, in determining the value of coal for taxation purposes.

Ascertaining the percentage of taxable coal in each property was another problem which occupied the attention of the Board. In the process of mining it is impossible to extract 100 percent of the coal in each seam. Various

factors are responsible for this situation. But inasmuch as it is practical to recover actually only a certain percentage of a deposit, determining a fair percentage that could be uniformly applied to all mines required some thought.

Equalizing the tax burden was a twofold problem which the Board was required to solve. It demanded not only that some attention be paid to uniformity among industries, but that the Board also consider uniformity between different types of coal mines. Large quantities of land in Utah were retained as a possession of the federal government, and many companies were producing considerable amounts of coal on this federal land. These companies were not required to pay taxes, but they paid a royalty of ten cents on each ton of coal they mined. In adopting a tax for privately owned companies, therefore, some equitable provision was necessary which would place the company that pays taxes on large land holdings somewhat on the same basis as the company that operates under a lease contract. Hence, it was intended that the system of assessing coal mines "should yield a tax which would approximate ten cents per ton of coal mined."² This tax load also approximated the loads borne by other industries.³

The schedule adopted. Each of these problems was carefully studied before the first schedule of assessment classes and values appeared. Past production and the

² Investigating Committee of Utah Governmental Units, op. cit., p. 45.

³ Ibid., passim.

facilities and possibilities of future extraction were considered in detail. Interest rates, extraction costs, market values, and much other economic data were also controlling elements in determining per-ton values. The problem of weighting each of these factors in such a manner as to work out a just and satisfactory tax was the primary objective of the Board at all times.

In the original schedule the class values varied with the distance from a component part of a mine, a coal outcrop, or a railroad according to the theory that the most accessible coal would be mined first. The coal in those 40-acre tracts which were being operated on a railroad was given the highest value.⁴ In the first schedule this value was three cents per ton, and it was designated as class "A" coal. Land which was not being operated but which lay one mile on either side of a 40-acre tract that was being operated was classified as "B" land. It was assigned a per-ton value of two cents. The first schedule also contained seven other classifications, each somewhat less desirable than "A" and "B" land, and each with a smaller per-ton value.

In 1919, when these values were worked out, it was estimated that a 6-to 12-year supply of class "A" coal and another 15-to 25-year supply of class "B" coal were being assessed against the operators.⁵ The assessment of the other classes added considerably to the assessable supply, but

4 For the complete schedule of original classes and values see the Twelfth Biennial Report of the State Board of Equalization.

5 Investigating Committee of Utah Governmental Units, op. cit., p. 46.

the rates were very low on most of these classes. The problem of deferred values, therefore, was considered and an effort was made to assess most highly that coal which would be mined first. The per-ton values that were assigned to each class were intended to be sufficiently high, when combined with the levy on capital equipment, to exact a tax on the representative coal company that would approach uniformity with other industries. The time required to extract each class of coal and the production rate of 1919 were, therefore, both weighted heavily in the original calculations.

Provision was also made for the assessment of 63 percent of the actual coal property.⁶ The remaining 27 percent was considered a legitimate waste. Coal extracted in excess of this percentage was tax free. In a subsequent section we shall consider added advantages of the 63 percent.⁷

Applying the tax. Each ton of coal that it was practical to extract in each legal subdivision was to be assessed until it was mined out. The actual production was deducted from the assessable tonnage as a depletion allowance. The tax cost of all the coal to which an operator had title became a cost of his current production.

If an operator owned land lying in several different classes, his tax was calculated by multiplying the amount of coal which it was practical to extract in each 40-acre tract by the per-ton value of the appropriate class. For instance, if a producer owned land containing one million

⁶ Ibid., p. 49.

⁷ See p. 71.

tons of assessable class "A" coal and two million tons of class "B" coal, his tax base was determined by multiplying one million tons by three cents per ton and two million tons by two cents per ton.⁸ The sum of these two products was the base to which the local and state mill rates were applied to determine the amount of his tax.

Changes in the schedule. The procedure adopted in 1919 has been modified only slightly, but the ton-values and classes have undergone some fundamental changes. Apparently, the original schedule undertaxed coal mines as compared with other industries because a revised schedule was worked out after two years experience with the first list of classes and values.⁹ The principal changes in the 1921 schedule consisted of adding two more classes, and in raising the per-ton value of class "A" coal from three cents per ton to four cents per ton, and class "B" coal from two cents to two and a half cents per ton. Some property was also written off the assessment rolls because the coal was not recoverable, and in a few cases tonnage estimates were revised to compensate for faulting and other variations which were not ascertained in the original survey. Each year's developments in any coal mine revealed new features. The seams could be thicker or thinner than was expected, wants were discovered, and coal quality was not always uniform. Provision was made, therefore, for adjustments in the valuation

⁸ This statement is based on the original schedule of values.

⁹ For the complete table of classes and values adopted in 1921 see the Thirteenth Biennial Report of the State Board of Equalization and Assessment.

on the annual developments as well as the computation made in the earlier survey.

In carrying out these provisions, the Board was handicapped somewhat by lack of funds.¹⁰ No appropriations were made to the department for checking up on developments which took place after the survey was made. Demands for adjustments which favored the companies were brought to the Board, but in many instances coal properties were worked to greater depths than was anticipated. However, no funds were available to employ an expert to check on these developments.¹¹ The occasional adjustments, therefore, had the effect of reducing the assessable tonnage, although there were many cases in which tonnage estimates of coal could have been materially increased.

The 1921 schedule was the basis of assessment until 1933 when a flat reduction of 10 percent on the values of all classes of coal land below class "A" was adopted. This change was justified in view of the depressed economic condition of the industry.

It was estimated in 1936¹² that there was enough class "A" coal in Carbon and Emery Counties alone to supply four million tons of coal per year for 12 years. Upon this same basis the class "A" and class "B" coal combined would supply production for 46 years. Continuing on this same basis,

10 State Board of Equalization and Assessment, Fifteenth Biennial Report, p. 11.

11 At present this is part of the job of coal mine inspector.

12 Investigating Committee of Utah Governmental Units, op. cit., p. 10.

the coal assessed in these two counties would supply the demand for 110 years. In addition to the enormous reserve in these two counties, 15 other Utah counties contain workable deposits. Many properties in these counties are also on the assessment rolls.

Much criticism of the present procedure is based on the fact that it assessed coal land so far removed from production. A considerable reserve of coal land increases the tax cost per ton of coal mined by a substantial amount. Engineers of the United States Treasury Department limit deferred values to a period of approximately 40 years.¹³ In Utah, classes "A" and "B" coal are not limited to that extent. The aim of the Board of Equalization, however, was to place values on all classes of coal land that would yield a tax payment which would approximate ten cents per ton of coal mined for the representative mine. If revenue had been the only consideration, values could have been placed on class "A" coal alone that were sufficiently high to yield the desired tax, and at the same time save considerable accounting expense. It is doubtful that raising a certain amount of revenue was the only factor considered in taxing mineral wealth on an ad valorem basis.¹⁴ Other advantages of taxing all privately owned land at some value recommend its maintenance.

In 1936 the State Tax Commission¹⁵ did make some concessions to the operators. A new schedule was adopted

13 Findlay, J. R. "The Future Value of Mineral Property," Brookings Lectures, p. 286.

14 See p. 72.

15 The State Tax Commission succeeded the State Board of Equalization and Assessment in 1931.

containing only four classes of coal land, and providing for lower assessment values on those properties that will not be mined for 40 or 50 years. On some classes reduction in ton-values amounted to as much as one cent per ton. Each 40-acre tract containing a truck mine was also removed from the regular classification. Provision was made for their annual assessment by the State Tax Commission. These changes unquestionably reduced the assessed values of many properties by a considerable amount. This new schedule is presented in table 1. It is still the basis of Utah coal mine assessments.

Assessment of machinery and equipment. So far in this section we have been discussing the assessment of coal land, and have barely mentioned that an ad valorem assessment on capital equipment is also a part of the present procedure of taxing coal mines. The reason is obvious; the special problem in assessing mines on an ad valorem basis is valuing the mineral deposits. Machinery and equipment are assessed on the same basis as capital improvements in any industry. The problem which equipment assessments in the coal industry presents is not one of valuation so much as one of amount. Approximately 44 percent of the total tax paid by the mines during the years 1925 to 1935 was based on the assessed values of capital equipment.¹⁶ It is doubtful that this burden has been reduced in view of the over-capitalized condition of the industry. This problem will be more completely discussed in the next section.

¹⁶ Investigating Committee of Utah Governmental Units, op. cit., p. 62.

Table 1. Method of assessing coal for taxation under rates effective 1936*

Class	Description	Ton Value
A	Land now operating on the railroad in 40-acre tracts will be considered as "operating" and in class A which are penetrated by a component part of the workings of an operating mine on the same bed regardless of whether actual production is now being made from the 40.....	4.0¢
B	Land on railroad adjacent to mines now operating within two miles of coal outcrop and one mile on each side of 40-acre tracts being operated.....	2.25¢
C	Land adjacent to class B but which lies from two to four miles from coal outcrop, and land requiring less than five miles of railroad, and included within two miles from coal outcrop.....	0.5¢
D	All lands not included in class A, B, or C, except 40-acre tracts containing truck mines....	0.07¢

Emery, Sevier, Sanpete, and Carbon Counties to be classified and assessed upon this basis.

Summit County class A to be appraised at 2.0¢ per ton, class B at 1.19¢ per ton, class C at 0.5¢ per ton. Assessments to apply only one mile back from outcrop.

Grand County to be valued on the same basis as Carbon County except class A at the rate of 2.0¢ per ton, class B at 1.19¢ per ton.

Iron County to be valued at a nominal rate per acre and to be assessed only one mile back from outcrop.

Each 40-acre tract containing a truck mine to be appraised annually by the State Tax Commission.

*Source: Investigating Committee of Utah Governmental Units, "An Economic Study of the Development of Utah's Coal Resources," p. 48.

ECONOMIC CHARACTERISTICS OF UTAH'S COAL INDUSTRY

At the time the ad valorem method of taxing coal property was adopted it was no doubt as fair a basis of taxation as any that could have been devised under conditions then prevailing. An effort was made to work out a scientific formula that would result in fair assessment values and a burden equal to those imposed on other industries. The program required many technical processes and much careful study; but after the plan had been completed, the consensus of expert opinion seemed to be that a fair tax base had been adopted.

If we assume that the procedure did originally result in fair assessments, it does not follow that the same would be true now. Even a scientific formula may prove unsound. Strictly speaking, it is only applicable as long as the original facts remain unchanged, unless the changes that have been made in the assessment schedule have kept up with industrial changes. Dynamic industrial processes do not long conform to rigid rules. The problem, therefore, of determining what industrial changes have taken place since 1919, seems important. With this information, we can analyze the effect of the present tax on the present coal industry.

Major economic problems. In recent years there have been a number of great disturbing factors tending to upset the equilibrium of the coal industry in general. These factors seem to group themselves into two sets of economic forces, each of which is responsible in part for the

instability of the industry: (1) those influences that resulted in capital expansion, and (2) those factors that were responsible for production curtailment. Since these forces have had a joint effect on the coal industry, it is difficult to determine which has been more significant in creating the problems which face the industry at the present time. Each, however, has exerted a significant influence in transforming coal production from an industry composed of a prosperous group of expanding enterprises in 1919, into one that is confronted with serious economic problems in 1941.

The situation in which the Utah coal industry now finds itself is graphically presented in figure 1. This diagram shows the annual Utah coal production, the five-year average, and the trend of expansion that ended in 1920. The broken projection line shows the tremendous gap between expected production as of that time, and the actual present figures.¹

This figure presents the problem rather clearly, but the actual causes of the disparity between capital expansion and coal production are worth discussing. Many of them are extremely important in analyzing the tax on coal.

Causes of Capital Expansion

Over-optimism. Industries as well as people grow from youth to maturity, but the industrial process is seldom recognized. Consequently, economic difficulties usually

¹ The straight-line projection of expected production is fitted to the rising production trend which preceded 1920. No claims are made for its accuracy. It merely projects a trend.

Million
tons

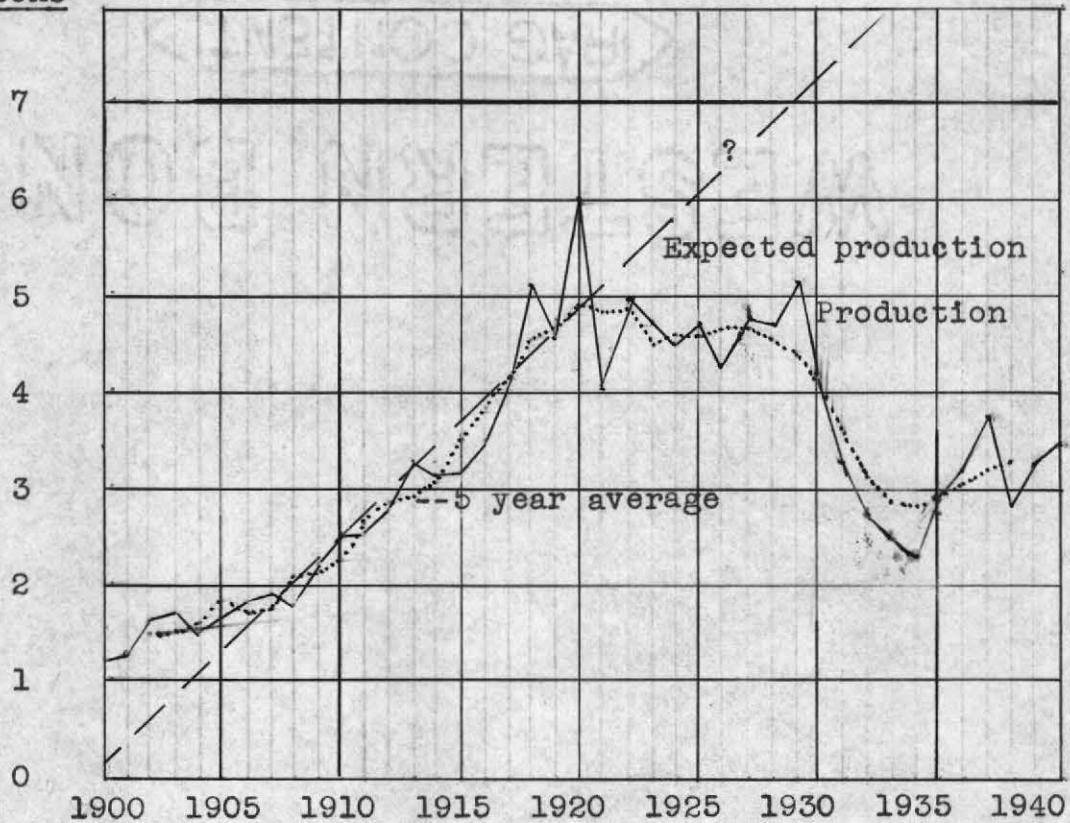


Figure 1. A comparison between the actual production and the expected production of Utah coal mines, 1900 to 1940

Data source: Appendix A

result. There is a limit to the use that mankind can make of any thing; and when it is supplied up to that limit, there is bound to be a turning point in demand. Coal production in Utah made phenomenal increases between 1870, when 5,800 tons were extracted,² and the peak year of 1920, when more than six million tons were produced. Probably the

² No coal production data were kept prior to 1870, although a mine within 40 miles of Salt Lake City began operations in 1863. The fact that the first Utah coal was shipped by rail in 1870 also makes this year significant.

most significant factor giving impetus to this expansion was the average increase in consumption per person during the period. For the nation as a whole, per capita consumption multiplied 28 times between 1850 and 1915.³ It seems logical to conclude that this same trend was largely responsible for the expansion of Utah mines.

During the period of growth the market for Utah coal was also becoming broader and more profitable. The demand created by this factor stimulated production. Coal began to roll in an almost steady stream from the Utah mines to the markets in the western states. The market expanded from British Columbia to Mexico and from the Pacific Coast to the Missouri River. Not only were mines stepping up operations to the extent that each individual could increase his consumption of coal, but more and more was being shipped over the rapidly expanding railroad system to supply an export market. Approximately 45 percent of Utah's coal production is consumed outside the state.

Population growth also had some influence on demand. Between 1870 and 1920 Utah's population increased 5.2 times. The demand created by this factor alone is sufficient to increase production more than five times if consumption per person had not changed from the 1870 average. However, the influence of population growth seems negligible as compared with the other two factors.

The combined effect of these factors, and possibly many

³ Findlay, op. cit., p. 285.

others which have not been discussed, resulted in a 1920 production that was 1,035 times as great as the production of 1870. This phenomenal growth can be explained in terms of increasing demand, but it does not take a mathematical genius to perceive that this progression could not go on indefinitely. But during a period of growth people cannot think that a change is mathematically certain. Growth becomes a part of the established order of things. If a process has promise of going on just a few more years, people invest in it as if it were going on forever. Capital equipment installations outrun production needs. The enterpriser wants to be prepared for the anticipated demand increase. When this new demand fails to materialize as it did in the coal industry, the mines are left to bear the fixed costs of more equipment than they need. Disturbing economic problems result.

The abundance of coal. Another of the chief causes of capital expansion in the coal industry is the fact that there is so much coal; and that it can be developed in so many places at comparatively small cost, and with little experience. One-fifth of the state of Utah is underlain with bituminous coal. More than 196 billion tons of workable coal is distributed among 17 Utah counties.⁴ Many of the beds are thick and consistent, making mining operations relatively inexpensive. In many places tempting outcrops can be plainly seen where a small expenditure can develop a

4 United States Geological Survey.

mine.

This condition as much as anything else is responsible for the fact that Utah now has 94 coal companies⁵ equipped to produce for a market which the four largest companies could easily supply.⁶ Not all of these companies are operating, however. A number are now submarginal units which have temporarily been withdrawn from production. If economic conditions are favorable to production, they may again start operations. In 1939, 58 mines reported production.⁷ These 58 companies produced an average of 49,086 tons, although 65.6 percent of the coal produced by these operators came from 15.5 percent of the mines.

Seasonal demand. The effect of seasonal demand on production facilities is also important. Much of the equipment that is productive in one season is excess capacity in another. Because of the absence of sufficient storage to level out seasonal demand, the mines must at all times be ready to ship what is wanted. In many sections of the country coal production evidences no seasonal variations worthy of note. Approximately 88 percent of the production of the United States is used for industrial activities.⁸ While these activities do slow up a bit in the summer months, it is not enough to show any marked seasonal slump.

The real seasonal fluctuations take place in those areas

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- 5 Bituminous Coal Commission, Schedule of Effective Minimum Prices, p. 4.
6 Investigating Committee of Utah Governmental Units, op. cit., p. 23.
7 Minerals Yearbook, 1940.
8 Breyer, Commodity Marketing, (An estimate).

where domestic fuel looms large in the market. Utah is a splendid example. Only 26 percent of the coal consumed in Utah goes to industry.⁹ The remaining 74 percent is used for heating homes, apartments, and other dwellings. It cannot be doubted that the seasonal nature of Utah's coal production is a powerful incentive to over-capitalization in the coal industry. A comparison between the seasonal variations of Utah's coal production and United States' coal production is shown by the accompanying indices of seasonal fluctuation.

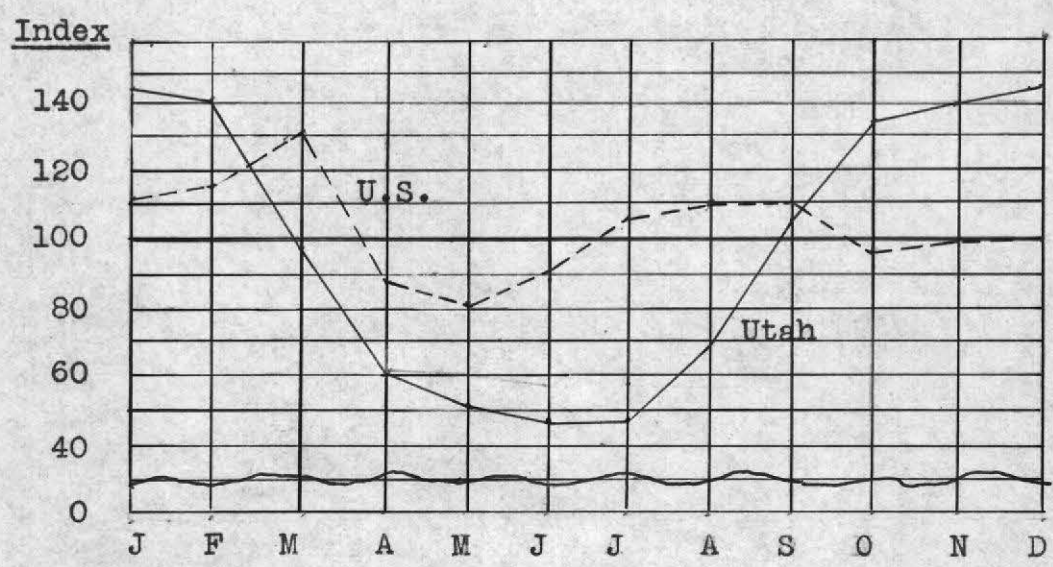


Figure 2. Indices of seasonal variations in coal production for Utah and the United States, 1935 to 1939

Data source: Appendix B

It may be noted from figure 2 that during some months of the year the demand for coal in Utah reaches abnormal heights, while at other times the demand falls to a very

⁹ B. P. Manley, Secretary of the Utah Coal Operators' Assn.

low mark. The production of November, December, January, and February almost equals that of the other eight months. Monthly variations in production for the United States are much less extreme.

Other factors. The World War boom resulted in some over-capacity in the coal mining industry also. Largely due to governmental insistence, for which there was no real need, many new mines were opened up.¹⁰ They have since added nothing to the economic welfare of the state, but have diluted the market for the more firmly established companies.

Of importance also were some promotional schemes. Since the industry had offered good returns for quite a long period, there seemed to be no reason why these returns should not continue for a period of unlimited duration. Clever promoters took advantage of this situation and endeavored to have costly installations revert to them after they had frozen out the stockholders. Some cases of over-development can undoubtedly be attributed to these schemes.

Result. All of these factors have combined to develop what some have chosen to call "the worst functioning industry in existence."¹¹ More mines have been opened up than were ever needed. More machinery and equipment has been installed than has ever been used. Each privately owned tract of coal land is taxable regardless of its rate of output. Each machine and building, each foot of rail and each tie upon

¹⁰ Eavenson, Coal Through the Ages, p. 87.

¹¹ Jensen, Government Finance, p. 124.

which the track is layed, is assessable whether it is excess capacity or part of an operating unit. The tax on productive deposits and reserve deposits, on operating equipment and excess equipment, are all costs of each ton of coal mined. It is reasonable to conclude, therefore, that the more tons of coal this total tax cost is spread over, the smaller will be the tax per ton.

Figure 3 illustrates the extent of over-capitalization for the years 1915 to 1940. The production line shows the actual output of Utah mines during the average number of days that the mines were operating each year. The full-capacity line gives us an idea of how much coal Utah mines could have produced if they had used their facilities for 308 days each year instead of the fewer number of days that the mines actually operated. The 260-day line illustrates the extent production could have been increased if Utah mines had operated five days per week throughout the year.

Figure 3 clearly shows that the coal mines of Utah have been capitalized beyond production needs. The average percent of excess productive capacity for this 26-year period amounts to 64.3 percent, assuming a full-time capacity based on a 308-day year. Or if we assume a production average of five days per week, the percent of excess capacity still averages more than 39 percent each year. This figure also shows a full time excess capacity which, stated in percentages, ranges all the way from 19 percent to more than 107 percent. In 1940, the latest year for which we have a report,

Thousands
of tons

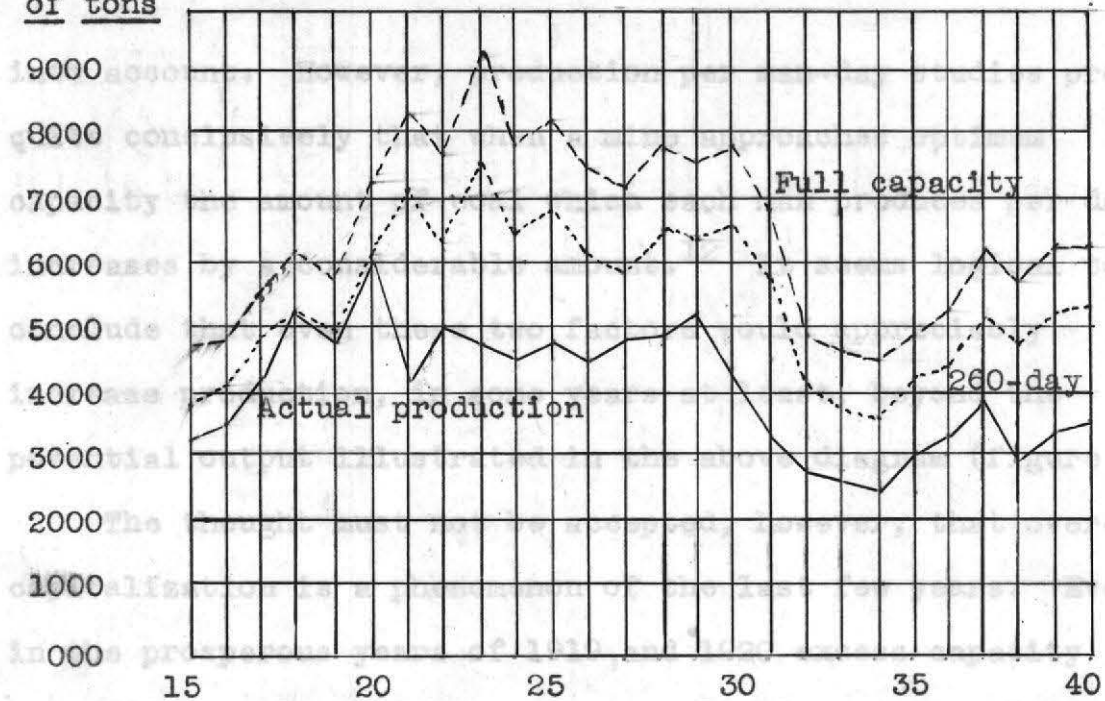


Figure 3. Trend of bituminous coal production and mine capacity in Utah, 1915-40

Data source: Appendix C

exceeded actual needs by approximately 25 percent. In the subsequent years of the decade capital facilities were fully

As long as the demand for coal was not seriously threatened, the industry could afford some excess capacity. Tax costs were not burdensome, nor were other costs, until the excess capacity amounted to more than 75 percent. Then, it seems probable, however, that figure 3 actually understates the extent of over-capitalization in the industry. It takes into consideration only those mines that are actually producing, while in reality there are many small submarginal mines that are equipped for production which now are wholly inactive, or else are supplying little more than the owner's fuel; and yet, if economic conditions improved, they would become significant producers. Inefficiencies resulting from small labor forces likewise are not taken

12 Investigating Committee of Utah Governmental Units, op. cit., pp. 17 and 23.

into account. However, production per man-day studies prove quite conclusively that when a mine approaches optimum capacity the amount of coal which each man produces per day increases by a considerable amount.¹² It seems logical to conclude that even these two factors would appreciably increase production, in some years at least, beyond the potential output illustrated in the above diagram (figure 3).

The thought must not be accepted, however, that overcapitalization is a phenomenon of the last few years. Even in the prosperous years of 1919 and 1920 excess capacity exceeded actual needs by approximately 25 percent. In the subsequent years of the decade capital facilities were fully 50 percent greater than were actually necessary for production. As long as the demand for coal was not seriously threatened, the industry could afford some excess capacity. Tax costs were not burdensome, nor were other costs, until production began to fall precipitously--and prices, also. Then, with small returns and high fixed costs, including tax costs, the industry felt itself in economic peril. Among those factors which reduced demand for coal were some that appeared to have a permanent effect.

Factors Responsible for Production Curtailment

Fuel economy. Perhaps the most important factor limiting the expansion of bituminous coal consumption was the remarkable increase of the thermal efficiency of plants

¹² Investigating Committee of Utah Governmental Units, op. cit., pp. 17 and 20.

using coal. Some data on this trend are given in table 2.

This efficiency trend began during the World War period when coal prices were high. It resulted in an extensive and exhaustive research in which commercial and industrial consumers found ways of doing the same amount of work with less and less coal. This meant a cumulative saving to large coal users of millions of tons, but the coal industry suffered to the extent of these savings.

Competing sources of energy. The coal industry is confronted with a number of strong competitors. It must openly compete with the oil, natural gas, and water power industries. If it cannot meet this competition successfully, then it will be gradually replaced by the other forms of energy. A "survival of the fittest" struggle has been going on for sometime with the result that the coal industry has had to give some ground.

While coal has been losing customers, natural gas and oil have been showing noticeable increases. Lack of sufficient data prevents a percentage breakdown of fuel consumption in Utah. However, the trend of consumption for all fuels in the United States is graphically depicted in figure 4. These data are expressed in British thermal units, because some common denominator is necessary to compare such unlike quantities as tons of coal, barrels of oil, and cubic feet of gas. An energy equivalent is determined for water-power.

Bituminous coal has lost heavily in the energy market

Table 2. Fuel efficiency trends in the United States for the principal coal-using industries

Industrial uses	Pounds	Reduction from base period (percent)
Steam Railroads:		
Pounds per 1,000 gross ton-miles freight service:		
Average 1919-20.....	170	--
Average 1938.....	115	32.4
Average 1939.....	112	34.1
Pounds per passenger-train car-mile:		
Average 1919-20.....	18.5	--
Average 1938.....	14.9	19.5
Average 1939.....	14.8	20.0
Electric-public-utility power plants:		
Pounds per kilowatt-hour 1919.....	3.2	--
Pounds per kilowatt-hour 1938.....	1.4	56.2
Pounds per kilowatt-hour 1939.....	1.4	56.2
Iron and Steel--pounds coking coal per ton of pig:		
1919.....	3,577	--
1938.....	2,884	19.1
1939.....	2,853	20.2
Coke manufacture: Savings of heat values through recovery of gas, tar, light oils, and breeze by extention of by-product in place of beehive coking, 1913-1939, expressed as a percent of coal used for all coke in 1939.....		
		20.6

Source: Minerals Yearbook, 1940

since 1918, and particularly during the depression years. Yet, in spite of this decline, it still remains the principal source of energy. Since no comparable data is available for Utah, no trend can be worked out to show whether or not coal is being displaced as rapidly in Utah as it is in other parts of the United States. It can be proved, however, that natural gas has made decided inroads on the

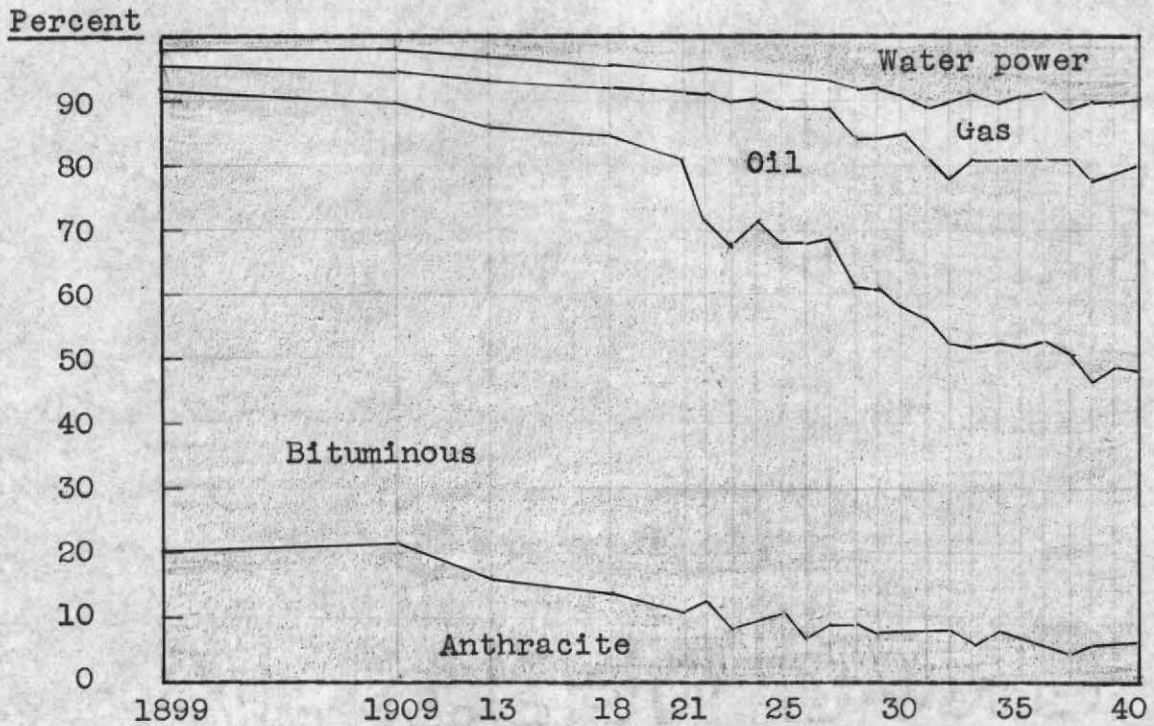


Figure 4. Percentage of Btu equivalent contributed by the several mineral fuels and water-power in the United States, 1899 to 1940

Data source: Appendix D

fuel markets of this locality since it was first brought to Utah in 1929. Evidence also seems to point to the conclusion that more and more fuel oil is being burned in the state.

In table 3 the trend of gas sales and of coal displacement due to the invasion of gas is presented for the years 1929 to 1940. To compare gas with coal, cubic feet of gas must be converted into tons of coal. By converting each fuel to a Btu basis and allowing for the burning efficiency of each, it is found that 22,073 cubic feet of natural gas and 38,627 cubic feet of coke oven gas are

average equivalents of one ton of coal.¹³ By dividing natural gas sales and coke oven gas sales by the appropriate equivalents, we get some idea of the extent coal has been displaced by gas.

Table 3. Trend of coal displacement by natural gas and coke oven gas in Utah, 1929-1940

Year	Gas sales in thousands of cubic feet		Equivalent output in thousands of tons of coal	Coal output in thousands of tons	Percentage gas is of coal output
	Natural gas	Coke oven gas			
1929	394,198		17,858	5,161	.35
1930	3,645,820		165,171	4,258	3.88
1931	4,774,234	159,374	220,419	3,350	6.58
1932	5,531,884	300,951	258,409	2,852	9.06
1933	5,799,670	300,792	270,537	2,675	10.12
1934	6,589,076	274,877	305,629	2,406	12.74
1935	8,614,014	357,292	399,501	2,947	13.55
1936	10,451,958	387,741	483,556	3,247	11.81
1937	12,340,830	427,344	570,155	3,809	14.97
1938	11,600,132	443,813	537,025	2,947	18.22
1939	13,100,300	469,183	605,644	3,340	18.13
1940	14,717,511	505,111	679,841	3,524	19.29

Source: Mountain Fuel Supply Company

Utah coal meets this same competition in other markets. In California, which is potentially the best market for Utah coal outside the state,¹⁴ it is estimated that natural gas and fuel oil are taking the place of coal to the extent of

¹³ These calculations were made by the Mountain Fuel Supply Company.

¹⁴ Utah has a 50 cents per ton freight advantage to Southern California. Freight rates to Northern California and Nevada are equal for Utah and Wyoming coal. In all other markets, Utah producers are at a competitive disadvantage because of higher freight charges.

112,000 tons daily, or 41,172,000 tons of coal per year.¹⁵ Undoubtedly the continuous expansion of the use of these fuels has taken place in part, at the expense of the Utah producers.

The competition of fuel oil in Utah is no small item. It was reported in 1935 that 133,899 tons of coal were displaced by oil.¹⁶ It is rather difficult to determine how much fuel oil is being used as a direct competitor of coal in the last few years. Public information on the subject is entirely lacking. It seems logical to conclude, however, that the trend of oil consumption is still upward. More oil-burning domestic equipment is being installed; Diesel engines are replacing coal burners; and oil burning bunkers and ships have wholly eliminated Utah's tidewater market.

Hydroelectrical energy competes directly with coal for such functions as cooking and water heating in the home, running of machinery and equipment in the factory, and supplying fuel for locomotives. Gas and oil generated electricity likewise are similar competitors. Engineering surveys estimate that more than four million tons of coal are being displaced by the electrical energy at Boulder Dam, Grand Coulee Dam, and Bonneville Dam.¹⁷ Undoubtedly, Utah coal output has been reduced to some extent as a result of this

15 Arthur E. Gibson, Secretary of Price Chamber of Commerce, Price, Utah.

16 Investigating Committee of Utah Governmental Units, op. cit., p. 70.

17 From the file of Senator George M. Miller, Carbon County, Utah.

cheap electrical competition.

The effect of economic changes on the coal industry.

Over-capitalization of productive facilities, efficient utilization of coal itself, loss of local markets to other fuels, loss of markets on the Pacific Coast, loss of the steamship trade, curtailment of railroad use, and depressed economic conditions in general; all of these, and probably other factors as well, have had the effect of seriously disrupting the coal industry of Utah. The stresses and strains of rapid economic change have brought the tax problem into bold relief. There is definitely justification for a reappraisal of the scheme of taxing coal mines.

Threatened with economic collapse, the coal industry fought valiantly to save its markets. When consumers began to clamor for a cleaner fuel, the producers obliged with coal that was "washed, dried, sized, blended, and waxed." When coal consumers turned to central heating plants which operated automatically, the industry prepared a suitable fuel for such uses. Likewise, when the consumers asked for a cheaper fuel, the mines began to install mechanized equipment in an effort to reduce the costs of coal production.

Great strides have been made within the last few years in the development and adoption of mechanical equipment peculiar to the industry. Indeed, the advances have been as far-reaching as in any other industry. Marvelous machines remove the coal from the earth. Huge factory-like tipples and cleaning plants prepare the coal for the consumers'

market. Utah's mines are among the most completely mechanized in the nation. In 1938, 93.7 percent of the coal mined in Utah was cut by machines and 49 percent was loaded by machines. For the nation as a whole, 87.5 percent of the coal extracted was cut by machines and only 21.4 percent was mechanically loaded.¹⁸ As a result, Utah mines are not only turning out a better fuel than they formerly produced, but also a cheaper fuel.

But it must not be overlooked that the coal companies are still burdened with more mines than are necessary, and with more capital equipment than has ever been productive. Regardless of how foolish or shortsighted these investments may have been, they are now part of the characteristics of the coal industry. Since current production must bear the fixed costs of all of this excess capacity, it is reasonable to conclude that each ton of coal is being produced at a much higher cost than would be necessary if the full capacity were utilized, or if the mining facilities were limited to that which was productive.

Among these fixed costs are taxes. Inasmuch as coal is assessed whether it is mined or not, and since machinery and equipment is assessed whether it is idle or operating, the burden of the tax is directly affected by the rate of coal extraction. We have shown the precipitous decline in production. But what about the tax cost per ton of coal mined? Have the revisions in assessment values been

18 United States Minerals Yearbook, 1940.

sufficient to maintain a uniform tax? Or has the burden increased? In view of the depressed economic condition of the industry, these questions justify an answer.

Then, too, gas, oil, and hydroelectric power have established themselves in part of the original coal market. There is no reason to expect that coal will be able to successfully regain the market it has lost to these competitors. The coal industry has reason to expect, however, that its tax burden shall not exceed those of its competitors. There is the perilous possibility that some of these competing fuels are being given preferential tax treatment. Since these fuels are creating little new demand, but are merely invading the coal market, it is only fair that coal should not be required to bear a discriminatory tax burden.

In our analysis of the coal mine tax in the next few sections, we shall try to determine just what effect these economic changes in the industry have had on the tax which the Utah coal mines bear.

THE TAX BURDEN

The burden which the ad valorem tax imposes on the coal industry is not a homogeneous load that can be isolated and analyzed with ease for each year the tax has been in effect. This is far from the truth. Although the tax is applied to all companies in precisely the same manner, no two operators pay exactly the same amount of taxes. There are several significant variables responsible for these differentials. All mines are over-capitalized to some extent, but the excess capacity is by no means uniformly distributed among the companies. It is also true that all producers hold considerable coal land in reserve, but some companies have many times as much coal land as others. And, since each ton of current coal production must bear the tax cost of both excess capacity and reserve land, in addition to that which is productive, it is reasonable to expect that there would be variations in the amount of taxes each company would pay. The fact that coal properties lie in different taxing districts and, in many instances, are subject to different mill rates, likewise results in varying tax burdens. Much coal property is subject to not only state, county, and school levies, but to a municipal levy as well. Differences in tax rates may also occur between the different counties and school districts.

Company variations. The wide variety of tax costs per ton of coal mined for 15 producing coal companies in Carbon County are illustrated in table 4. These data were prepared

in 1925 by the State Board of Equalization.¹ Unfortunately, no data on the burden that the tax imposed are available prior to 1925. However, the fact that the original schedule of assessment values was revised in 1921, and that higher values were placed on several classes of coal land, seems to indicate that mines were underassessed during the first two years that the system operated.² Experimentation with the new schedule was carried on for a few more years, resulting in some modifications and minor adjustments. By 1925 the procedure was well established, and the Board published its first report on the tax burden of different companies under the new set-up. A portion of this study appears in table 4.

Table 4. Statements showing an analysis of taxation for producing coal mines in Carbon County for the year 1925

Company	: Tax in cents : on coal land : for each ton : of coal mined	: Tax in cents : on mach. & imp. : for each ton : of coal mined	: Total general : property tax in : cents per ton : of coal mined
A	: 11.4	: 7.4	: 18.8
B	: 17.5	: .5	: 18.0
C	: 17.9	: ---	: 17.9
D	: 8.5	: 4.6	: 13.1
E	: 4.1	: 5.8	: 9.9
F	: 5.1	: 1.4	: 6.5
G	: 1.8	: 3.1	: 4.9
H	: 2.2	: 2.0	: 4.2
I	: 1.4	: 2.4	: 3.8
J	: 1.5	: 2.2	: 3.7
K	: 1.4	: 2.0	: 3.4
L	: 1.0	: 2.2	: 3.2
M	: .6	: 2.2	: 2.8
N	: 1.3	: 1.2	: 2.5
O	: .4	: 1.6	: 2.0
Average	: 3.8	: 3.0	: 6.8

¹ State Board of Equalization and Assessment, Fifteenth Biennial Report, p. 166.

² See p. 14.

It can be seen that the proportion of the tax that is based on machinery and improvements averaged approximately 44 percent. This percent had not changed in 1935,³ and it is probable that this proportion has increased considerably since 1935. Land values were reduced in 1936 by an appreciable amount,⁴ while at the same time expert assessors were revaluing the capital equipment of mines.⁵ As a result, much unassessed property has been added to the assessment rolls, and much underassessed equipment has been given its full value. No doubt these two factors have made the tax on the equipment and improvements even more burdensome to the mine owners. the same period the company with the high-

est Table 4 also shows that taxes per ton of coal mined vary considerably between companies. These variations can be accounted for mainly on the basis of the varying amounts of coal land owned by the company and by the rate of coal production. If production is high, excess equipment is reduced to the minimum, and tax costs per ton of coal mined are greatly reduced. The burden per ton, of course, will increase as coal production slumps because the assessment will not be reduced in proportion.

A later study prepared under the direction of Dr. J. R. Mahoney⁶ for the years 1928 to 1933 emphasizes the variations in taxes paid by different companies on the

3 Investigating Committee of Utah Governmental Units, *op. cit.*, p. 43.

4 See p. 16. 642 tons, we discover that this company

5 State Tax Commission, Fifth Biennial Report, p. 84.

6 "Some Economic Aspects of the Utah Tax Laws in Operation," pp. 18A to 20A.

assessed equipment valuation. On the same basis, the company with the highest tax costs was assessed \$1,217,773 on its capital equipment. Dividing its average annual output of 555,984 tons of coal by the assessed valuation, it is discovered that this company produced only .46 of a ton for each dollar of equipment valuation.

The fact that the values of land and improvements were listed separately in this study made another interesting comparison possible. Wide variations in the relationship of these items to each other were presented. In some cases, the assessed valuation of land was as low as 10 percent of the value of improvements. In other cases, it was found that land assessments were more than 300 percent of the value of improvements. Where this percentage runs to a high figure the taxes per ton of coal mined are likely to be large.⁷ This will be true especially if there is not an accompanying large production of coal in proportion to the land owned by the company.

In some cases the companies are finding it to their interest to allow coal land to revert to the county with the idea that when it is later needed it can be leased and paid for under a royalty basis. By so doing, important reductions in the assessed value of coal land are being realized.

Time variations. Not only are there variations in the tax burden of different companies, but these variations are

⁷ Table 4 illustrates this point.

quite marked in different years. It is with these time differences that we are primarily concerned in this study. Although differentials in the tax burden of companies are significant, they can largely be attributed to the policies of the operators. On the other hand, marked differences in the tax burden for different years are mainly a function of the tax.

The task of analyzing time variations is more difficult than making comparisons between companies. In fact, there is no clear-cut method of grouping pertinent data from all coal companies for purposes of inductive analysis. The burden of the tax may change over a period of years, but analyzing just how much of the change is due to each of the dynamic factors that may be responsible is an almost insuperable assignment. Consequently, we must resort to averages, trends, and tendencies for our conclusions. Despite their short-comings, these methods represent the best available tools which can be applied in the study of important problems of taxation; and we have reason to expect that they yield fairly reliable answers in most cases. However, it must be recognized that conclusions arrived at through theoretical analysis must be drawn with some reservation.

At no time have state taxing authorities aimed to provide a uniform tax burden for all coal companies. They have been more concerned with the average burden which the tax imposes. Whether this policy is justifiable or not,

it is about the only procedure that could be followed in regulating the burden of the tax for the industry as a whole. Apparently there has never been a time since the ad valorem method was adopted that some companies have not been paying more taxes than were originally intended by those who formulated the plan. Moreover, there have been other companies that have paid less than was intended. The real criticism against the tax has come from those producers who feel that their tax load is excessive. They bring calculations and expert opinions to the Tax Commission to prove the injustice of their tax burden. They claim the tax is discriminatory, that it favors their competitors who produce under royalty contracts, and that the tax results in a competitive disadvantage in markets where other fuels are sold. From the point of view of the company, these problems are of vital importance. Taxing authorities, however, have more or less ignored these claims and have continued to interpret the tax in terms of what the average load should be.

Information on the average tax burden of Utah coal mines is not easy to gather. Very little is published on the subject, and the problem of making original tabulations requires more time and effort than one could possibly spend in making a study of this type. However, from various sources we have been able to gather a rather complete file of data on the assessed valuation of mines, taxes paid, annual production, and the total annual value of the coal

produced. In cases where these figures were not up-to-date, the necessary information has been supplied through original tabulations.

In table 5 average taxes per ton of coal mined and per dollar of gross income are presented for the years 1925 to 1940. From this table we can get some conception of the time variations in the average tax burden of Utah coal mines.

Another type of comparison which illustrates the changes in the average burden of coal mines for different years may be shown by comparing the assessed valuation of mines with the annual production. For many purposes the assessed value is a more reliable basis for making comparisons than taxes paid. This statement is based on the fact that property located in different jurisdictions will take different tax rates in mills. If property is justly assessed, two tracts of coal land of equal worth will be assessed the same regardless of their jurisdiction.

In order to show the relationship between assessments and production, the actual figures for each year have been converted into indices. This necessitated the selection of a base year. After taking many factors into consideration, 1925 seemed to be the most suitable year. In the first place, it has the tacit approval of the State Board of Equalization. Prior to 1925 the Board was adjusting and modifying the procedure of taxation, but no changes were made for sometime after this year even though a rather

Table 5. Average taxes per ton of coal mined and per dollar of gross income for Utah mines, 1925 to 1940

Year	Production in thousands of tons ⁽¹⁾	Value of coal mined in thousands of dollars ⁽²⁾	General property tax ⁽³⁾	Tax cents per ton of coal mined	Tax cents per \$ of gross income
1925	4,690	\$11,991	\$389,039	8.29	3.25
1926	4,374	10,362	381,147	8.71	3.68
1927	4,781	11,084	383,290	8.02	3.46
1928	4,843	12,253	374,764	7.74	3.08
1929	5,161	12,725	392,193	7.59	3.08
1930	4,258	10,515	414,058	9.73	3.94
1931	3,350	7,442	418,948	12.51	5.63
1932	2,852	5,685	404,648	14.19	7.12
1933	2,675	5,109	373,455	13.96	7.25
1934	2,406	4,746	386,292	16.05	8.14
1935	2,947	6,101	370,049	12.56	6.07
1936	3,247	7,143(4)	283,940	8.75	3.98
1937	3,809	8,370(4)	287,400	7.54	3.35
1938	2,947	6,788(5)	271,727	9.22	4.00
1939	3,340	8,350(5)	262,663	7.86	3.15
1940	3,524	9,515(5)	242,117	6.92	2.54
Avg.	3,700	8,636	352,233	9.97	4.48

- Sources: (1) Minerals Yearbooks
 (2) Investigating Committee of Utah Governmental Units, op. cit. appendix
 (3) A Message of Vital Importance to Every User of Coal and Gas in Utah, Mountain Fuel Supply Company, p. 16
 (4) Minerals Yearbook, 1938
 (5) Estimates from company sources

complete study of the tax burden was made in 1925.⁸ Then too, economic conditions were more normal than they had been for a number of years. The war boom and the subsequent depression had both passed and business prospects were good. An additional reason for selecting 1925 is the

⁸ See p. 39.

fact that it was included in table 5. For comparative purposes an earlier base year would have been less desirable.

The comparison between the two indices is shown in figure 5. When production declines and assessments show no corresponding movement, the tax burden has increased. Conversely, a production increase without an offsetting increase in assessments suggests a lighter tax burden.

Only in five depression years has the average tax burden per ton of coal mined been higher than the ten cents per ton royalty which operators pay on leased land. Several factors undoubtedly prevented taxes from becoming even more burdensome: (1) the 1933 rate reductions which amounted to 10 percent of the assessed value on all classes of coal land except class "A";⁹ (2) the policy of the companies which permitted large tracts of reserve land to revert back to the counties; (3) an upward trend of production that began in 1935; and (4) the general revision of assessment values in the spring of 1936.¹⁰ All of these factors combined to reduce tax costs to figures far below the royalty level during the past few years.

Although there was a marked disparity between assessments and production during these depression years, it is doubtful that the ad valorem tax was more burdensome to the mines than it was to the other classes of property that were assessed on the same basis. In both table 5 and figure 5 there seems to be sufficient evidence to

⁹ See p. 15.

¹⁰ See p. 16.

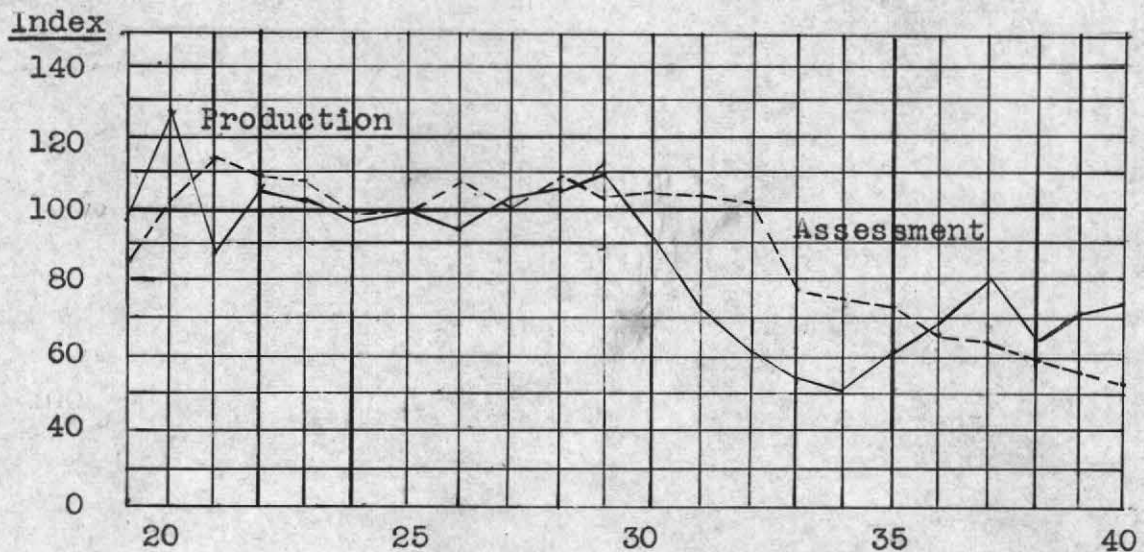


Figure 5. A comparison between tax assessments and coal production for Utah mines, 1919-40

Source: Production data: Minerals Yearbooks
Assessment data: Figures for 1919-35
from Report of the Investigating
Committee of Utah Governmental Units.
Figures for 1936 to 1940 are original
tabulations from State Tax Commission
records

justify the conclusion that coal mines are not excessively taxed. Although the economic changes which have taken place in the past 22 years have been upsetting to the industry, and at times have almost doubled the average burden of taxation; nevertheless, the ad valorem system has been flexible enough to meet these changes. The 6.92 cents per ton tax in 1940 does not represent over-taxation. Rather, it appears to be the lowest per-ton tax that the mines have borne in many years. Before we could be sure about this statement, however, we would need to know something about the ability of the mines to shift their tax.

Changed economic conditions alter the ability of mines to shift the pecuniary burden of their tax. It may be that a tax of seven cents per ton would be more burdensome to the mines now than a ten cents per ton tax would have been 20 years ago. This would be true if the operators formerly bore only half the incidence of the tax assessed against them; however operators now assume the full burden. This problem is important enough to justify more complete investigation.

If the present trends of assessments and production continue (figure 5), it appears that a wide disparity will develop in which mines may actually be considerably under-taxed. At least one conclusion may be safely drawn from the analysis of this section: viz, taxed operators are being treated preferentially as compared with their competitors on royalty lands. If the state is still aiming to maintain a parity between taxes and royalties, the present trend should suggest some changes. The direct tax burden in 1940 was lighter per ton of coal mined than it has been in any year (with the possible exception of 1920) since the ad valorem tax was adopted. This reduction is even more significant in view of the fact that the mill rates which are applied to the tax base have risen considerably.¹¹ When taxes paid per dollar of gross income or per ton of coal mined are declining and the mill rates are rising, it

¹¹ Investigating Committee of Utah Governmental Units, op. cit. p. 46.

may suggest that the changes in the assessment schedule of mines have reduced their value to such an extent that mine taxes are now out of line with other property taxes. Probably the original formula needs to be rechecked.

RECORDED

WESTERN BOND

THE INCIDENCE OF COAL MINE TAXES

One cannot probe very far into either the theoretical or practical problems of taxation without running head-on into the problem of incidence. The fact that taxes, under certain conditions, may be shifted is a characteristic of taxation that has long been familiar to students and observers of tax systems. Perhaps no other aspect of the subject has engaged their interest more. In analyzing some taxes, it is quite easy to ascertain who bears the principal load; but in the case of other taxes, discovering who assumes the pecuniary burden is a difficult economic problem.

There is no common agreement as to who bears the coal mine taxation load. Although figures occasionally appear which tend to convey the idea that taxes on coal mines are eventually shifted on to the consumer in the form of higher coal prices, the problem is not so simple as the figures indicate. In most instances such data are merely subtle propoganda sponsored by the companies upon whom the tax is imposed. To illustrate, the dollar in figure 6 appeared in an attractive advertisement in a leading Utah newspaper. Beneath the diagram, the companies stated that "yearly taxes paid by those engaged in the production and distribution of Utah coal amount to \$2,035,000."¹ But although these taxes are paid by the producers and distributors of Utah coal, the advertisement obviously conveys the idea that the tax

¹ Salt Lake Tribune, January 30, 1936.

bill is costing each consumer seven cents out of each dollar he spends for coal.

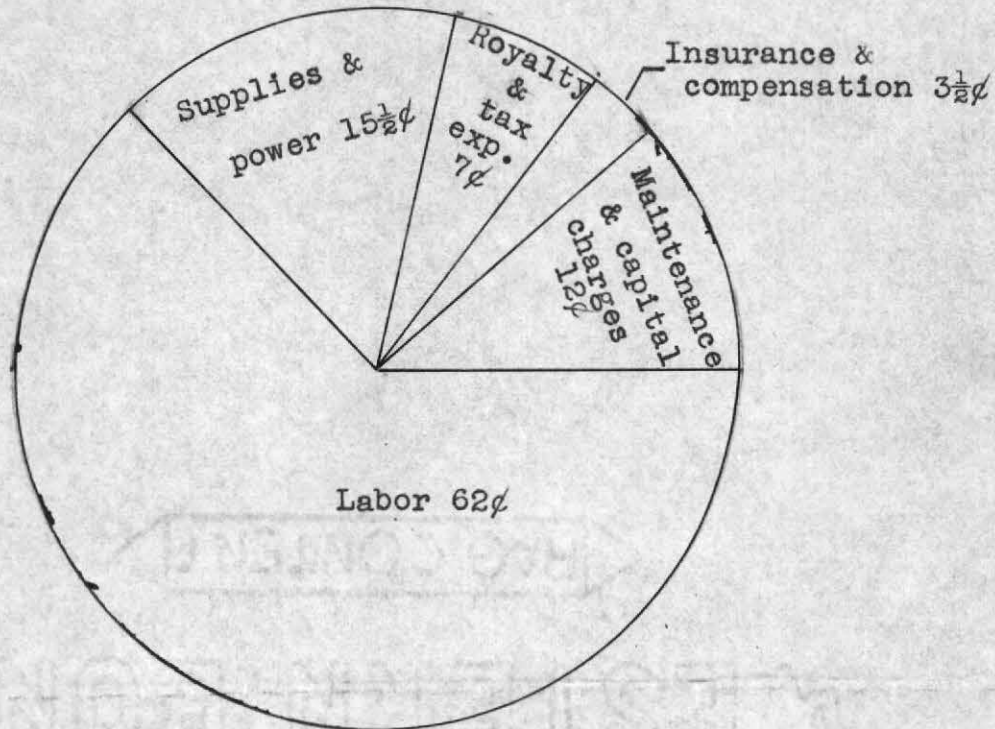


Figure 6. How the coal dollar is spent

This naive assumption often made by business men and the public is but a half-truth. The thought behind this reasoning is that costs must be met, and accountants put taxes down with the costs; hence, all the producer has to do is add the tax to the price and automatically he gets it back. The grocer, we are informed by the newspapers, raises the price of butter, eggs, bacon, and spices in order to get back his tax; the landlord passes all his taxes to the tenant; the farmer adds his school and road taxes to

the price of his wheat; and coal companies, so the popular theory runs, pass on their taxes to the long-suffering public with unerring certainty. The theory is simplicity itself.

What the theory does not explain, however, is the reason why the coal producer should be so interested in convincing the consumer that the government slices seven cents out of each dollar he spends for coal, if he bears no part of the tax assessed against him. The theorist who makes the consumer the ultimate victim of any tax also fails to give any reason why prices could not have been raised before the imposition of a new tax, or an increased tax, just as easily as prices could be raised after the levy is made.

The fact is that this naive but popular theory has no sound basis. It is but one form of popular fiction. Students of taxation have probed into the secrets of shifting and incidence and have come out with an answer that is less easily diagramed, but considerably more realistic. It is true that many taxes levied on a producer or a dealer raises prices, rarely by the whole tax, usually by a major part, occasionally by a small part only. The problem, therefore, is one of degree of "shiftability." What portion of the coal mine tax can be shifted to the consumer? Under what conditions is shifting possible?

Conditions of shifting. Tax shifting requires that the person who originally pays the tax to the government

shall be able to recoup himself by means of some counterbalancing transaction. The direction in which a given tax will be shifted depends somewhat upon the line of least resistance. In general, however, the problem is a study of conditions under which a person paying a given tax can increase the price of his commodity in order to shift the increased cost that the tax imposes. In this analysis we shall consider tax shifting as one aspect of the theory of value and price, recognizing, at the same time, the possibility that some of the tax may be shifted backward.

Under competitive conditions the factors determining price are supply and demand. Coal mine taxes are imposed upon suppliers. Obviously, when they are subjected to the tax they must move first. The demanders are not concerned as yet. The transfer of the tax from the producers to the consumers is not done voluntarily. That is, buyers of coal do not offer to pay higher prices simply because they want to be generous to those who pay the tax. Some form of economic compulsion is necessary, but this compulsion must be exerted by influencing the available supply of coal. What the suppliers can do is go on a strike, so to speak; that is, they can curtail the supply, which will tend to raise prices.²

Marginal analysis. One form of curtailment comes as a result of the forced withdrawal of the marginal producers

² Conceivably, they can curtail the demand of what they buy as well as the supply of what they sell; but for the sake of brevity, the alternative of backward shifting is ignored here.

from the market. The supply might also be reduced and the higher prices obtained without eliminating producers, if some of the suppliers cease producing the marginal portion of their former output. Whether or not this occurs depends on the degree of organization and cooperation among producers. In any event, it is the marginal supply that is eliminated.

Other things being equal, therefore, shifting is most likely to take place when the tax levied strikes all competitors proportionately, including, of course, the marginal competitors. When some taxpayers have to compete with untaxed rivals, the latter are the ones who set the price. In the coal industry taxation tends to be uniform. No mines are exempt. Each mine owner must pay taxes on the coal deposits to which he holds title, and the per-ton value tends to equal that of competitors. The effect of such a tax can be illustrated by a simple theoretical schedule (table 6).

Table 6. The effect of a tax on marginal mines

Mine	Production costs	Price	Profit	Tax	Profit after tax
A	\$2.65	\$3.00	\$.35	\$.10	\$.25
B	2.70	3.00	.30	.10	.20
C	2.75	3.00	.25	.10	.15
D	2.80	3.00	.20	.10	.10
E	2.85	3.00	.15	.10	.05
F	2.90	3.00	.10	.10	.00
G	2.95	3.00	.05	.10	-.05
H	3.00	3.00	.00	.10	-.10

Before the imposition of the tax, each of the eight mines could sell its coal at a price that would tend to cover all costs of production, although mine "H" received no profits. In column six the profits are shown after a tax amounting to ten cents per ton is imposed. It will be observed that mine "H" and also mine "G" now incur a deficit that may cause them to retire from business, in which case the supply will be curtailed, and the price will rise. Mine "F" becomes the no-profit or marginal-producing unit. If the procedure outlined in this table carries through, the six companies that remain solvent will be able to shift a large portion of their taxes in the form of higher prices.

Since the producers bear the impact of the tax, the buyers are not concerned unless the supply is curtailed and a price rise results. Only when this happens do the demanders act. Some of them may buy less coal and use the reduced amount more efficiently. Others may turn to substitute fuels if they are available, thus curtailing their coal purchases wholly or in part. As a result, prices which are a function of both supply and demand will tend to decline.

Elasticity of demand. The demand for different products is not equally sensitive to price changes, however. The nature of the demand, especially with regard to the degree of elasticity, must be considered. Elasticity of demand means the degree to which the amount demanded will be affected by changes in price. Elasticity is always a relative matter. The general principle is that the more inelastic

the demand is for a commodity, the more certainly and completely can the tax on this commodity be shifted. If consumers will buy practically as much of a commodity at a higher price as they will buy at a lower price, then the increase in price will not check consumption, and tax shifting is easily accomplished. On the other hand, if slight changes in price cause great fluctuations in demand, the producer will naturally hesitate long before risking the severe shrinkage in sales which even a moderate price advance would be sure to produce.

Coal is usually classified as having a relatively inelastic demand. In other words, people buy coal even though prices force them to forego other purchases. There is danger, however, in emphasizing this point too strongly. Coal does have an importance for domestic heating and industrial activities which is second to no other fuel, but in no sense does it dominate the heat and energy market. In fact, we have noted the curtailment of coal demand. Other fuels have been rapidly assuming greater importance as coal has continued a steady retreat. Producers had less difficulty in shifting taxes to the consumer in 1919 than they have at the present time. Coal had fewer competitors then. Its markets were expanding and prices were high. The demand for coal was inelastic. If the price was raised a few cents in order to shift an increased tax, practically as much coal would be purchased at the new price as was taken at the old.

Economic changes in the industry have made taxes less shiftable. Efficiencies have reduced the amount of coal each consumer requires for a given operation. Many former customers have turned to gas, oil, or hydro-electric power. Markets have contracted and prices are so low that the federal government has intervened to save the industry from ruin. Demand has become more elastic. Any price increase to offset a tax levy would be carefully considered. The effect of such an experiment might be a loss of coal markets, and increased sales of substitutes.

The chief fallacy in the theory that the consumer pays all the taxes, therefore, lies in the assumption that the seller alone determines whether or not a tax will be shifted. Prices are set by buyers and sellers. If buyers are unable or unwilling to pay a higher price for the fuel they burn in order to assume the incidence of a tax, the seller must either assume the tax himself, or else run the risk of elimination from production. The influence of the buyers is sufficiently important to prevent a complete shifting of the tax; and since the demand for coal is becoming more elastic, the buyer influence is even more significant. Although the producers may be desirous of raising prices by the full amount of their tax, or even more, their discretion is limited by the fact that the demand for coal is not dictated by them.

Even though the demand for coal is becoming more elastic, it is still relatively inelastic. In some areas

competition is keen, but in other localities coal has the market much to itself. It is possible, therefore, for coal to meet the competition of gas and oil where they threaten, and raise the price in less competitive areas.³ In this manner the operators could shift the tax to "selected" bearers who are not in a powerful position to resist price increases. So far as elasticity is concerned, there is still much reason to believe that coal taxes can be shifted.

Immobility of capital. There are other factors, however, that tend to discourage tax shifting. One of these is the immobility of capital. If taxes become burdensome to an industry, and its capital is easily withdrawn, there is a good opportunity to shift the tax. The capital will seek employment where taxes are less heavy, or where profits are more certain. If, however, the capital is largely fixed and specialized, withdrawal is much slower and shifting is correspondingly retarded. In the long run, an industry which is subjected to heavy taxes on fixed capital can gradually withdraw through the process of depreciation until the output declines sufficiently to cause the price to advance.

The coal industry is tremendously over-capitalized with fixed, specialized equipment. As more of the processes are performed by huge mechanical devices, the possibility of shifting the tax burden becomes more remote. In the days when a coal miner's equipment consisted of a pick, drill,

³ In setting coal prices, the National Bituminous Coal Commission permits lower prices in areas where the competition of other fuels is keen.

lamp, and mule-drawn pit-car, there was no serious economic pressure to keep the mine running. If demand fell off, no large deficit would pile up if the mine closed down for a few months until business picked up. But, if demand slackens now, rather than stop operations the company will take almost any kind of price reduction. If the price will pay the variable costs plus something to apply to fixed costs, it will be more profitable to operate than to close down.

The nature of costs. This problem of costs must also be considered from another angle. The influence of a tax imposed on an increasing-costs industry will not be the same as that imposed on a decreasing-costs industry.

Since coal mining is an extractive industry, the type that usually follows the pattern of increasing costs, it would seem logical to analyze the effect of coal mine taxes in terms of increasing costs. If our study were based on long run phenomenon, this would be the logical approach. But at present the coal mining industry is a decreasing-cost industry, and in this study it will be analyzed from this point of view. In figure 7 data that bear out this claim are illustrated.

Undoubtedly, the reason for the present cost pattern is to be found in the over-capitalization of the industry. The idle equipment as well as the productive equipment is included in the overhead. Hence, each ton of coal produced must bear not only its share of the fixed costs of productive equipment, but also a share of the fixed costs of idle

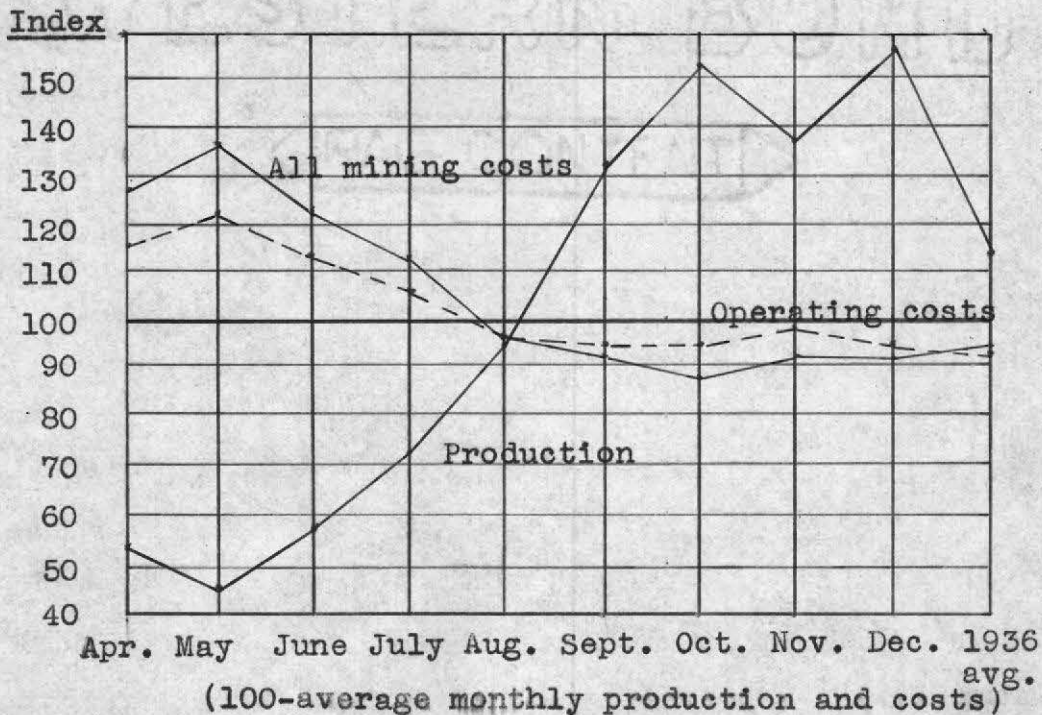


Figure 7. A comparison of production, operating costs, and all mining costs for Utah coal mines, April to December 1937, and the year 1936

Data source: Appendix E

equipment. It stands to reason, therefore, that the larger the production volume the smaller will be the fixed costs per ton of coal. Figure 7 confirms this logical conclusion.

When a tax is imposed on a decreasing-costs industry and the supply is decreased to raise the price, the company must not only increase the price by the amount of the tax to completely shift it, but by the amount of the tax plus the higher per-unit costs resulting from the reduced volume produced. Thus, if all other conditions of shifting are favorable, an increase in price greater than the tax will result. If the company does not succeed in raising the price

sufficiently to offset the full amount of the tax plus the increasing cost per ton which results from the reduced supply, it has failed in its effort to shift completely its tax load to the consumer.

The exact explanation of the nature of industries with decreasing costs and what happens when taxes are imposed upon them is somewhat obscure. The situation in such industries may perhaps be conceived as illustrated in table 7.

Table 7. Production costs of various coal mines.

Tons produced:	A	B	C	D	E	F	G	H
100	\$2.35	\$2.40	\$2.45	\$2.50	\$2.55	\$2.60	\$2.65	\$2.70
200	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65
300	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60
400	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55
500	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50
600	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45
700	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40
800	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35
900	1.95	2.00	2.05	2.10	2.15	2.20	2.25	2.30
1000	1.90	1.95	2.00	2.05	2.10	2.15	2.20	2.25
Avg. costs:	2.125	2.175	2.225	2.275	2.325	2.375	2.425	2.475

According to this hypothetical illustration, eight mines are engaged in production. Some have higher costs than others, and presumably mine "H" is marginal. Each mine operates under conditions of decreasing costs and must, we shall assume, cover average costs or retire from operations.

The cost figure in table 7 indicates the decrease in costs resulting from the production of additional units.

Thus it will cost mine "A" \$2.35 per ton if only 100 tons are produced, and \$2.30 per ton if the total production is increased to 200 tons, and so on. If the price is \$2.50 per ton mine "H" can stay in competition and produce its capacity output of 1,000 tons, but if the price drops below \$2.50, it can no longer remain in competition.

On the basis of the above assumption, the supply which might be forthcoming can be presented in tabular form as follows:

Table 8. The supply of coal from various mines at a given price

Price	A	B	C	D	E	F	G	H	Total
\$2.50	1000	1000	1000	1000	1000	1000	1000	1000	8000
2.45	1000	1000	1000	1000	1000	1000	1000		7000
2.40	1000	1000	1000	1000	1000	1000			6000
2.35	1000	1000	1000	1000	1000				5000
2.30	1000	1000	1000	1000					4000
2.25	1000	1000	1000						3000
2.20	1000	1000							2000
2.15	1000								1000
2.10									000

If we now assume a demand schedule, it will be possible to illustrate the probable effect of a ten cents per ton tax (table 9).

With the demand schedule as in column 3, the equilibrium price will be \$2.30. If, now, a tax amounting to ten cents per ton is assessed on all coal mining property, production will be curtailed as shown in the revised supply schedule in column 4. With the additional cost resulting from the tax,

Table 9. The influence of ten cents per ton tax on coal production

Price	Supply	Demand	Supply after tax of 10¢
\$2.50	8000	000	6000
2.45	7000	1000	5000
2.40	6000	2000	4000
2.35	5000	3000	3000
2.30	4000 * * * *	4000	2000
2.25	3000	5000	1000
2.20	2000	6000	000
2.15	1000	7000	000
2.10	000	8000	000

and the demand schedule remaining the same, neither mine "H" nor "G" (table 7) is able to stay in the market, and as a result the supply is reduced by 2,000 tons. The new equilibrium price is \$2.35, an increase of five cents over the former price. This, it will be observed, is only half of the tax. Theoretically, therefore, the companies are able to shift only half of the tax assessed against them.

However, it is possible that an industry of decreasing costs may show a different situation. If all firms are equally efficient so that there is no marginal concern, the price may advance by more than the amount of the tax thus resulting in a complete shifting of the tax burden. Conditions somewhat of this character prevail in a well-developed industry of decreasing costs in which large and increasing output are centered in a few large concerns. But these industries tend to have few major competitors and are themselves not competitive in the sense that their prices are

set in the market. Here we have a state of monopolistic competition.

We come now to the close of our investigation of incidence, and to a consideration of the question of whether the economic changes which have disrupted the coal industry have affected the ability of operators to shift their tax burden.

In the first place we have seen that there is no basis to the theory that all taxes are passed on to the consumer. Even though mine taxes are a cost of production, it is not always possible to shift costs. The graveyard of bankrupt businesses is solemn evidence of this fact. Probably there is no better example of the possibilities of deficits than in the coal industry itself. In an industry which lacked 11 cents per ton of covering its costs of production in 1936,⁴ who would be so audacious as to suggest that all tax costs are shifted to the consumer?

Equally absurd is the theory that taxes stay where they are put. Since a tax is a cost of operations, the operator is going to shift it if he can. Whether he is successful or not is going to depend on the relationship of his economic position to that of the consumer. Shifting is a contest between the suppliers and the demanders. The outcome is wholly dependent on the economic power each is prepared to exert. If the producer can exert more economic pressure on the buyers than the purchasers can withstand, the producer

⁴ See p. 1.

will be able to shift some of his tax burden. But, if the economic defense of the consumer cannot be broken by the producer, the operators will have to bear a major part of their tax burden.

The relation of these two forces is not constant. In fact, it may change frequently and vary widely. At the time the ad valorem tax was adopted there was much evidence which leads us to believe that a major portion of the tax could be shifted to the consumer. Demand was outrunning production. New industrial markets and new geographical markets were opening up. Most of the capital equipment was operating; therefore, costs per ton of output were rather low. Coal had no serious competitors; consequently, demand was inelastic, and the tax applied uniformly to all producers regardless of whether they were marginal or profit-making companies.

Many of these factors have changed since the tax system was adopted in 1919. Instead of coal producers being aggressive enterprisers, they are now defensive enterprisers. With less coal being used for a given operation, owing to fuel efficiencies, and with serious competitors invading the coal market, it seems logical to conclude that the demand for coal has become considerably more elastic in recent years.

Declining production, rapid mechanization, and the demand for prepared coal have resulted in excess capacity, decreasing costs, capital immobility, and a wider tax base. The net result of all of these factors is an industry which must produce at any coal price that will cover variable

costs plus any additional amount that might apply to fixed costs. If this happens to be enough to cover completely all costs, then the major portion of the tax can be shifted. But if the realization from sales is not sufficient to cover all costs, it is rather far-fetched to suggest that taxes are shifted.

The uniform application of the tax to all companies has been maintained, and submarginal mines are still being forced out of production. Three large Utah mines discontinued operations in 1938 and 1939.⁵ Depressed economic conditions resulted in the withdrawal of many others in earlier years of the decade. With fewer mines supplying the demand, it seems that the supply could be limited to a quantity that would cover all costs, including taxes. It is doubtful, however, that mines would run the risk of further surrendering their markets to competing fuels just to be able to shift completely all costs to the consumer. Furthermore, the defense tactics of coal companies have driven them together into a trade association. As a result, they have given up their autonomy to certain degrees in order to pool their individual interests. While the association does not guarantee the survival of all mines, it does regulate in the interest of the industry at large.

The changed condition of the industry seems to warrant the conclusion that the strategic advantage of the producer has been weakened, while the economic position of the coal

⁵ Salt Lake Tribune, March 29, 1940, p. 12.

consumer has been strengthened. As a result, mines are less able to shift their tax burden now than they were during the first decade that the tax was in effect.

In view of the severe competition which now confronts coal operators, it would be unwise to increase the tax burden of the coal industry. Although the direct burden of coal mines has decreased to a low figure during the past few years, it seems likely that the pecuniary burden is as heavy as ever. The coal industry is still in distress despite a rising production trend and decreasing taxes. In a subsequent section we shall compare its tax position with those of competing fuels. But before making these comparisons, perhaps we should note a few of the advantages of the present ad valorem procedure.

REGULATORY ASPECTS OF THE TAX

Although this is a study of taxes, we need to pass in review certain other provisions that are incident to Utah's procedure of taxing coal mines. A tax on natural resources has come to be more than a source of governmental revenue. It is judged by more than the usual canons of good taxation. A resource tax is now recognized as an important instrument of public administration. Once the standards of public policy have been formulated, the taxation system can serve as a valuable aid in the effective administration of that policy. In this sense, a tax may be a significant tool of regulation.

This philosophy is especially important in considering coal mine taxation. Coal is a wasting asset; that which is extracted or wasted in the process of extraction cannot be reproduced. The accepted standard, therefore, has come to be one of conservation. Each generation is entitled to only that portion of nature's fuel store which it can prudently use. The owner of coal property has no moral or legal right to waste or extravagantly utilize the resource he controls. His right to own property is merely a relative right, and not one that is absolute. The danger, therefore, of coal supplies being worked in a reckless and extravagant manner without regard to the welfare of future generations, can be justifiably regulated through the taxing powers of the state.

One important purpose of special taxation is to control exploitation of coal resources, but frequently the method adopted is not entirely consistent with the public policy of conservation. Whether or not an ad valorem tax is adapted to a conservation program is questionable. Instead of discouraging mining, it seems more plausible to conclude that an ad valorem property tax will have the opposite effect; that is, it will encourage the owners to mine out from under the tax. If the mines are forced to produce to offset the tax load, the ad valorem tax is open to some objection from the point of view of conservation. Stimulated current production will tend to result in price decreases. This, in turn, may stimulate demand which again may be undesirable from the point of view of conservation. This, no doubt, is carrying the issue out to a very fine point. The annual production of coal is kept in check to some extent by the unwillingness of the public to buy unlimited quantities even at cheaper prices. This check puts the brakes on any tendency to produce and market all available coal within a short period. The tax burden, nevertheless, is ultimately a cost that must be carried by each ton of coal produced; and in order to meet competition, it is imperative to balance production with fixed overhead so that the costs per ton are not greater than the value of the product. Companies with large land holdings and idle equipment must, therefore, step up their production to maintain an equilibrium. Hence, the ad valorem method of

taxing coal lands has been an incentive to over-production within the industry. How much practical effect the tax has had is not known. Unfortunately, no data are available on this point.

Although there are objections to an ad valorem tax from the conservation viewpoint, there are provisions in the Utah system that tend to offset over-production tendencies. The system tends to prohibit operators from opening mines on all outcrops. This is accomplished by placing a higher valuation on the 40 acres being mined and on the coal within one mile of a mine opening than is placed on the coal farther back from the point of operations. Coal nearest the surface is easily mined, but it would not be a wise policy for the state to permit mine owners to extract the coal on the surface and to forget about the coal that is more difficult to obtain. After a mine entrance has been abandoned and allowed to cave in, it is impossible to re-enter the mine to the coal face through the caved-in area to mine the coal that is left. To preserve the wealth of the state, it is imperative to prohibit exploitation by requiring that no new mine openings be made until it is necessary to do so. The procedure of taxation in Utah quite effectively accomplishes this objective.

Taxing coal until it is mined out need not be entirely contrary to conservation objectives. Under the Utah system provision is made for the assessment of 63 percent of the actual coal in the property. The theory behind the 63 percent is that it will be possible actually to recover only

this amount, but it is possible in most instances for the companies to recover more than 63 percent. Some companies recover as much as 90 percent of their deposits so that about 27 percent of their production is tax free. The average for all companies is about 73 percent. Some operators, however, actually extract only about 40 percent¹ by not mining as thoroughly as others. In this case the coal mined bears a much heavier per-ton tax load. No doubt the philosophy of these mine owners is that the increased tax per ton is less than the increased cost per ton of mining the coal that is more difficult to get. The tendency, however, is for the tax to prevent the exploitation of coal deposits. The taxation system seems to provide a real incentive for the operators to mine clean in order to get as much tax-free coal as possible.² Taxes levied on output lack this feature. The most accessible coal tends to be extracted--and taxed--and the remainder is wasted. On this point the ad valorem tax seems to have a definite advantage.

Also among the advantages of the system is its methods of discouraging large land holdings, thus preventing monopolies. This is accomplished by providing that present production must carry the tax load for the value of coal in all idle lands. The cost becomes excessive if too much land is owned. An operating company should be granted the privilege of controlling enough land to insure future operations. This is necessary to justify the capital outlay for an

1 Investigating Committee of Utah Governmental Units,
op. cit., p. 50.

2 Ibid., p. 49.

efficient production unit. It is generally believed, however, that a monopolistic condition arising from the control of all the most accessible coal land would be highly detrimental.

The present system of taxing coal lands on an ad valorem basis effectively prevents one company from profitably holding large tracts for future use. Large variations in the tax per ton of coal produced and the tax per dollar of income illustrate the effect of the amount of land in excess of a profitable margin, the company becomes overbalanced and either is forced to drop some of its land holdings or increase production to carry the load. The latter alternative may be possible in the short-run, but it has its limitations. Increased production does not solve financial difficulties for industries whose products tend to have an inelastic demand. Eventually, limiting land holdings to a reasonable reserve becomes imperative. Output taxes provide no such penalties on large land reserves.

Utah's experience with the ad valorem tax has been highly satisfactory. Not only does it provide most of the essentials of conservation, but the tax is a reliable source of income, it is easily calculated, and its administration is not difficult. The mines, however, have repeatedly criticized the tax on the ground that it is discriminatory and excessively burdensome. There is no question but that the tax burden has been rather constant. No wild fluctuations have resulted from its imposition. Yet, there are industries

whose tax load has been less burdensome in one period than in others because of the fluctuating character of their tax. Furthermore, the coal operators contend that their chief competitors are being given preferential treatment while coal mines are being singled out for special penalties. This is a bold contention.

In view of our analysis up to this point, there seems to be little basis for this contention. The procedure of taxation was carefully worked out, and it has been flexible enough to permit changes. Although these changes on occasions have lagged somewhat, it is doubtful that coal mines have suffered more than many other Utah industries. If they have, the reason is not found in the ad valorem tax, but in the general depressed condition of the industry. On the question of uniformity we must make a few observations before drawing conclusions.

SOME TAX COMPARISONS

General analysis. It is one thing to advocate taxes, or to enact taxes for their regulatory effects; it is quite another thing to recognize that all taxes have regulatory effects. Included in the Constitution of Utah is the following statement:

The Legislature shall provide by law a uniform and equal rate of assessment and taxation on all tangible property in the state, according to its value in money, and shall prescribe by law such regulations as shall secure a just valuation for the taxation of such property, so that every person and corporation shall pay a tax in proportion to the value of his, her, or its tangible property.

It is not difficult to formulate these expressions, but to devise a workable system that is in even fair accordance with them is another matter. Yet, if a tax is not truly uniform, it discriminates between economic elements and modifies the economic order.

Although the problem of tax equalization is among the most difficult in the field of public administration, it is also one of the most vital. Working out bases of comparison for testing equality is not an exact science. The presence of many variable factors tends to force the investigator to use relative methods. Equating two unlike taxes on two unlike industries is a complicated problem, but equating many unlike taxes on numerous unlike industries is an exceedingly complex problem.

One type of comparison that is quite generally used in equating tax burdens is taxes per dollar of gross income. The valuation placed on property for taxation purposes should

take into consideration its income-producing powers. This is one chief element in the commercial world in fixing valuations on all types of productive properties and should serve as the basis for tax assessments. This should be a normal income rather than one that will vary widely between prosperous and depression years. On this basis, a net income is less suitable than gross income.

Unfortunately, no current comparative data are available which show the tax load that the various industries of the state pay per dollar of gross yield. Moreover, the data that are available do not include the same years in many cases. One study which was published in 1934 compares the taxation of several Utah industries in one prosperous year and one depression year.¹ Some of these data are included in table 10.

Table 10. Taxes in cents per dollar of gross operating income for six Utah industries, 1928 and 1932.

Industries	:	1928	:	1932	:	Average
Coal mining	:	3.06	:	7.13	:	5.10
Metalliferous mining	:	2.49	:	5.76	:	4.13
Agriculture	:	5.70	:	11.81	:	8.75
Railroads	:	4.65	:	9.00	:	6.83
Power companies	:	9.64	:	12.73	:	11.18
Telephone & telegraph co.:	:	6.23	:	8.11	:	7.17
Average	:	5.28	:	9.09	:	7.19

The data shown in this table are not given as sufficient basis on which to adjust tax burdens. They merely illustrate one approach to this intricate problem. With such information

¹ Committee of Nine Report, Some Economic Aspects of Utah's Tax Laws in Operation, passim.

as a base, and combined with a careful analysis of many other factors that may be known or that may be discovered, it is possible to arrive at conclusions and judgments of justice which are superior to conclusions without such information. In as many cases as possible, these comparisons should be carried over a series of years so that it would be possible to analyze the tax load during all cyclical phases.

With the exception of the tax on metalliferous mines, there has been little change in the relative tax burden of these industries over a period of years.² But while most assessments have been rather constant regardless of cyclical changes, the net proceeds tax on metalliferous mines has been fluctuating violently. The adoption of an occupational tax in 1935 to supplement the net proceeds and ad valorem assessments has had only a negligible effect upon the erratic fluctuations of the tax on metalliferous property. These wide variations are a source of difficulty for all governmental units depending upon this source of income. Since the formula for taxing metalliferous mines has been incorporated in the Constitution, there is nothing that the State Tax Commission can do to equalize the burden at present. As a result, the tax may yield an assessment for mines above or below other types of property; and insofar as either of these conditions result, the general objective stated in the Constitution, of

² Ibid., passim, and Biennial Reports of the State Tax Commission, passim.

uniformity of assessment according to value, is defeated. Indeed, this is an ironic situation that one section of the Constitution should provide for uniformity and another section should set up rigid rules that make uniformity impossible.

Utah's experience with taxes on a net-proceeds basis has not been very fortunate. The taxes on most properties are more burdensome than is the metalliferous mine tax. The basis for this statement is the fact that the tax on metal mines follows the ability to pay principle. During the depression period when the coal industry, under relatively unchanged assessment values, suffered a net loss of $2\frac{1}{2}$ million dollars,³ the net proceeds assessments dropped from \$97,032,409 down to \$1,443,458. This change automatically adjusted the taxes of metal-producing mines to their ability to pay; but such obviously preferential treatment undoubtedly disturbed and modified the operations of the other industries, and, at the same time, deprived the state of much needed revenue to carry on its increasing functions.

While the taxation of metalliferous mines is a classical example of unequal treatment, there is no justification for believing that it is the only example. Indeed, there seems to be rather widespread criticism of the present system of taxation. The present critical attitude comes, in a large measure, from the conviction that our tax system fails properly to distribute the burden of taxation. If something could be done to equalize the burden of taxation as between individuals

³ Investigating Committee of Utah Governmental Units, op. cit., p. 52.

and economic groups it would bring the double result of a reduced tax burden on the over-taxed and of peace of mind to those who feel a sense of injustice in what seems to them a tax system that does not conform as much as it should to fundamental principles of justice.

Taxation is largely a matter of expediency rather than careful analysis. If a new industry moves into the state, or if our economic and social structure increases so that additional revenue is needed to carry on the functions of government, the question before the legislature is not one of determining the tax which is best adapted to the economic organization, but one of determining the most lucrative source of revenue. Often, too, the real effect of a tax cannot be determined until it has been in operation for a period of time. It is only natural, therefore, that the dynamics of an economic system should make a periodic adjustment of taxes necessary. Maladjustments incident to economic changes must be equitably adjusted, or else other industries will expand at the expense of the over-taxed industry.

The natural gas problem. An excellent example of tax dissatisfaction is found in the fuel industries of Utah. Coal producers claim that the gas company is being given preferential tax treatment. In each of the last six regular sessions of the Utah Legislature, an act providing for additional taxes on natural gas has been introduced. Both sides have entered vigorously into the controversy, but as yet the plan of the coal people has not received legislative approval. But before

analyzing the tax of each to determine whether or not uniformity exists, perhaps we should outline a background for our analysis.

Background of the problem. The factors which have led to a decline in demand for coal have been discussed. Studies of coal markets and of coal consumption disclose that increased efficiencies in coal utilization for power and heating purposes, development of water power, and the displacement of coal by fuel oil and natural gas have each taken a heavy toll from the Utah coal market.

Scientific advancement in the utilization of coal is commendable because it increases efficiency and conserves a valuable natural resource. Furthermore, it has strengthened the position of coal in competing with substitute fuels. Free competition between water power, coal, and other fuels in areas where each abound, are essential to progress and the improvement of economic welfare. But, where the market for any of these energy sources is arbitrarily extended into the market territory of another because of preferential taxes or freedom from regulatory control, economic peril overtakes the invaded industry unless regulatory measures are adopted which will maintain parity in competition.

Direct competition of gas. Whether or not gas sales in Utah are a result of preferential treatment is a subject of vigorous controversy. In the most densely populated areas of Utah natural gas is available. This product is piped from producing fields in Colorado, Wyoming, and Daggett County,

Utah. Since 1929, when natural gas was first introduced into Utah, the utility has made phenomenal growth.⁴ As a result, Utah coal production has been sapped to an alarming extent. In 1940, natural gas displaced 666,765 tons of coal.⁵ This quantity amounted to nearly 20 percent of the total coal output of that year. Although the gas company refers to this reduction in coal sales as a "negligible displacement," the sale of this quantity of coal would have increased the gross operating income by more than \$1,800,000.⁶ This would have been a highly significant increase in coal revenue in view of the fact that the coal industry already had enough capital equipment available to produce this additional quantity. Even a slight increase in revenue is significant in a decreasing costs industry.

This displacement means more than a loss to the mines of much needed revenue; it means an employment loss of more than 110,000 man-days of labor for the year.⁷ Therefore, approximately 630 mine laborers who had depended upon the coal companies for the prosperity and security of themselves and their families were displaced by gas pipes and gas labor. But when all the labor elements incident to coal production, distribution, and consumption, including mining, transportation, retail handling, firing, ash disposal, etc. are considered, the man-days of labor amount to approximately 600,000.

4 Table 3, p. 30.

5 Assuming 22,073 cubic feet of gas as equivalent to one ton of coal.

6 Coal valued at \$2.70 per ton at the mine.

7 Utah mines operated an average of 175 days in 1940.

This means a total labor displacement of approximately 3,500 men.⁸ To offset this unemployment trend, the gas company employed 336 men in 1940.⁹ On this basis it seems safe to conclude that unemployment has increased as coal sales have decreased due to gas displacement.

Railroad companies, also, suffered an irrecoverable loss. In 1940, the coal production decline resulting from the gas invasion reduced railroad traffic by 14,817 cars of 45 tons each, or 212 trains of 70 cars each. Moreover, coal truckers, retail dealers, and others who depended on the coal industry for a livelihood were affected by the 20-percent displacement of coal. Indeed, the effects of the expansion of the gas utility have been farreaching and revolutionary.

Labor taxes. There are other aspects of the problem that should be discussed. Coal mines are among the largest employers in the state. This means large payrolls. The industry is regulated by the federal government regarding wages, prices, and company policies. No higher wages are paid in Utah than are paid by this industry, but wage costs are not the only labor costs of a modern business. Compensation and social security taxes are also significant costs. They rest most heavily on those industries which employ the most labor. Since the labor cost of producing a ton of coal is almost three times as high as the labor cost of producing an equivalent volume

8 A common phrase in coal advertising is "A ton of coal purchased employs a man a day."

9 Mountain Fuel Supply Company, op. cit., p. 11.



of gas, it seems to follow that these labor taxes are almost three times as burdensome to the coal industry as they are to their gas competitors. However, there is one other point to consider before coming to a conclusion. It may be that the gas company is indirectly employing more labor and paying more labor taxes in the form of prices on their new capital equipment than is the coal industry. Every foot of pipe is a product of labor and bears a wage cost and a tax cost. Although this is an indirect form of employment, it is equally significant in an economic analysis.

Recent statements of the Mountain Fuel Supply Company indicate that approximately \$1,000,000 is being invested in capital expansion each year. In 1938, this increase amounted to \$1,440,000, and in 1939, to \$564,000.¹⁰ The coal industry, likewise, invests heavily in fixed capital. The rapid mechanization and coal preparation program has resulted in an expenditure of more than \$1,000,000 per year.¹¹ Therefore, the coal industry and the gas utility are about even in their expenditures for indirect labor and labor taxes. The coal industry, however, spreads this indirect cost over its larger fuel production, with the result that the load is less burdensome per ton. It is doubtful that the difference which the gas company pays would equal the direct costs of labor and labor taxes which the coal producers bear, however.

Rate determination. The type of competition that natural

10 Statement of the Mountain Fuel Supply Company.

11 Statement of the Utah Coal Operators Association.

gas offers is significant. No yardstick of values is employed. The rate-making formula of the gas company is simply one of charging the domestic consumer as high a rate as possible, and charging industrial concerns whatever rate is necessary to displace coal. The gas companies vociferously deny this charge, but its truth is quite well established. Authorities¹² have recognized this unfair competition and have loudly condemned it. Even company officers on occasions have referred to the industrial consumption of gas as merely a stop-gap. On this point, Floyd C. Brown¹³ made the following comment:

It is a fundamental principle that a long distance transmission line must depend on domestic business for its base load. The economics involved prevent natural gas from competing with cheap power plant and boiler coal, except for short intervals during the period of developing and connecting the domestic markets.

It is authoritatively stated that about $4\frac{1}{2}$ cents per thousand cubic feet is paid leaseholders and others for gas at the point of production. The cost of gathering this gas is another one and a half cents, making the total field cost about six cents. The cost of pipe line transportation has been shown to be three cents per 100 miles. Since the length of the transmission line from the gas fields to Salt Lake City is 531 miles,¹⁴ we have a transportation cost of approximately 16 cents. This, plus the field gathering cost of six cents gives a total of 22 cents per thousand cubic feet delivered

12 Eavenson, Coal Through the Ages, p. 89.

13 Vice President and General Manager of the Natural Gas and Pipe Line Company of America, Chicago.

14 Report of the Utah Public Service Commission, 1940, p. 134.

in Salt Lake City.¹⁵

These are average figures and may not accurately reflect costs in Utah. Transportation costs, especially, could be too high. The gas sources tapped for Utah consumption have more pressure than gas producing wells in most areas. Rather than have to pump the gas to Utah markets, the Mountain Fuel Supply Company has to reduce the pressure before it reaches the consumer. But even if this results in a considerable saving, and even if other costs are also less than the above averages, it still seems logical to conclude that much gas is being "dumped" onto the Utah market at less than the actual costs of production.

In 1938 the average price that the natural gas utility charged consumers in Utah for each thousand cubic feet of natural gas are as follows: domestic, 64.6 cents; commercial, 35.7 cents; and industrial, 11.1 cents.¹⁶ These figures are also averages. In reality, almost half of the gas sold in Utah was sold at the rate of 8.1 cents per thousand cubic feet.¹⁷ This is little more than the cost of the gas at the division point. The low industrial price of gas is a result of a large available supply of gas in the field, and a planned attempt to capture much of the market from other fuels. If gas is reduced to a coal-equivalent basis, table 11 shows the per-ton prices of natural gas and coke oven gas.

15 These data are from a report prepared by the Illinois Reciprocal Trade Association, The Facts About Natural Gas in Illinois.

16 Minerals Yearbook, 1940.

17 Testimony of B. P. Manley before the Senate Judiciary Committee.

Table 11. Gas sales, revenue, and value for each volume of gas equivalent to one ton of coal, 1938-1939.

Gas	1938			1939		
	: Gas : :sales : :m.c.f.:	: Total : revenue	: Value : : per : ton*	: Gas : :sales : :m.c.f.:	: Total : revenue	: Value : : per : ton*
<u>Natural</u>	:	:	:	:	:	:
Industrial	: 9,512:	:\$1,150,758:	\$ 2.67:	: 10,902:	:\$1,309,811:	\$ 2.65
Domestic	: 2,088:	1,381,576:	14.60:	: 2,199:	1,464,284:	14.69
<u>Artificial</u>	:	:	:	:	:	:
Industrial	: 270:	36,125:	5.17:	: 283:	37,319:	5.09
Domestic	: 174:	80,457:	17.85:	: 186:	86,073:	17.85
Total	: 12,044:	:\$2,648,916:	:	: 13,570:	:\$2,897,487:	:

*Fuel equivalent basis.

Source: Statement of Mountain Fuel Supply Company

This table shows that the domestic consumers who used approximately 17 percent of the natural gas sold in Utah actually pay more than half the revenue to the gas company. Why the domestic consumer should pay 5½ times as much for a given volume of gas as does the industrial consumer has no explanation other than the fact that the company can get that much more. True, the industrial concerns buy more gas, but the cost per unit has no relation to the price of industrial fuel. In setting these prices the company arbitrarily fixes them low enough to win a customer.

Coal companies can offer no such differentials, however desirous they may be of retaining their customers. One of the basic reasons which prevent the coal operators from cutting the price of coal to a ridiculously low figure is the cost of transportation. Since more than half of the retail

price of coal is a transportation cost, coal companies are effectively prevented from cutting below this figure; and operations could not continue long if the companies did not at least cover their variable costs. This includes labor and supplies, which are the two major costs in coal extraction.

The gas company owns its own transportation facilities. Hence, it is not imperative that transmission costs be collected on each cubic foot of gas.

Another important reason why coal companies cannot cut prices so freely as can their gas competitors is the fact that they are regulated by the federal government. Prices are fixed, and broad discriminations are not permitted. Gas has no such check.

Pertinence to a tax analysis. The gas industry has created no new market, no new demand for fuel, has brought not a single industry to Utah. It has grown, and grows, only as it has taken, and takes, a market from other fuel. It has taken jobs from men and traffic from the railroads. With the decreased prosperity, earning ability, and even abandonment of mines, resulting from loss of markets, the taxable values of coal mines and of coal mining communities have been reduced. Likewise, tax revenues on coal yards and the equipment used in the transportation and delivery of coal have declined.

Furthermore, the gas company employs fewer men than have been displaced in the coal fields. They fail to make up this

deficit in indirect employment in the form of capital equipment. Hence, they pay less wages and less labor taxes. Moreover, they employ no yardstick of values and therefore offer a vicious type of competition to other fuels. The gas utility is unregulated in its competitive activities. All of these charges are justified, but, all of them together do not indict the general property tax on grounds of discrimination. Coal producers should meet the issue squarely in challenging the uniformity of fuel taxes. The economic effect of coal displacement on labor, railroads, communities, and the state is one thing; the injustice of a tax is quite another. The arguments in proof of each are not interchangeable.

There is no question but that the coal industry has suffered from the competition of gas. It is equally obvious that the economic effects of this revolutionary invasion has seriously affected other activities. But still this is no basis for a claim of tax inequality. It might suggest that the unregulated condition of the gas utility gives natural gas a competitive advantage. Or, it might suggest that the gas company with its streamlined and efficient organization is much more capable of competing in the market than the coal industry with many production units and scores of distributors. The presentage emphasizes efficiency. Perhaps the coal industry has not awakened to this fact. And, perhaps wasteful competitive practices in the past, and to a certain extent even now, have placed the coal industry in a serious economic condition.

The federal government has recognized this state of dis-

organization, but it is questionable whether it has helped alleviate the distress. It may even follow that the price-fixing program has made matters worse. The futility of fixing the price of one product without exercising similar control over related products and substitutes has been demonstrated many times. The federal government is working on the assumption that a slight rise in the price of coal at the mine would mean higher wages for labor and profits for the operators. But the practical effect of the program may be turning purchasers to substitute fuels and making the position of the mines even more precarious. A slight increase in the price of a commodity with a relatively elastic demand results in an important decline in revenue. Both individuals and corporations are constantly comparing costs of one type of fuel as against another. Those to whom natural gas is accessible will shift from coal if business costs are thereby reduced.

From this analysis we might suggest two reasons why gas sales have increased so rapidly in Utah: (1) the inefficiency of coal production and distribution, and (2) the absence of regulatory control over the practices of the gas utility. These two factors reduce the ability of coal to compete. Of the two, the first seems much more important. It may be that tax inequality is a third factor, but it is doubtful that uniform tax treatment would do as much for the competitive position of coal mines as would the elimination of fully half the production units and half the retail dealers. Since this sug-

gestion is impractical under our present system, perhaps a discussion on the question of taxation should be made in an effort to determine the relative tax position of each company.

Tests of tax uniformity. All of the evils of the coal industry cannot be attributed to tax inequalities. But, coming back to a point we made in the beginning, tax inequalities may seriously handicap the industry which is being given discriminatory treatment. Just because we cannot agree with the coal operators that lack of tax uniformity is the chief reason for their loss of markets does not mean that we do not attach importance to the problem.

In table 12 taxes paid by the gas company are presented for the years 1929 to 1940, together with the tax per equivalent ton of coal.

Table 12. Total property taxes and taxes per equivalent ton of coal paid by the gas industry in the State of Utah, 1929 to 1940.

Year	:Gas sales in thousands:		: Equiva- : lent tons: : of coal	: General : property : taxes	: Tax per : equivlt. : ton of : coal
	: of cubic feet : Natural : gas	: Coke oven: : gas			
1929	: 394,198	:	: 17,858	: \$ 70,783	:
1930	: 3,645,820	:	: 165,171	: 119,876	: 72.58¢
1931	: 4,774,234	: 159,374	: 220,419	: 108,501	: 49.22
1932	: 5,531,884	: 300,951	: 258,409	: 107,953	: 41.78
1933	: 5,799,670	: 300,792	: 270,537	: 109,590	: 40.51
1934	: 6,589,076	: 274,877	: 305,629	: 112,678	: 36.87
1935	: 8,614,014	: 357,292	: 399,501	: 138,389	: 34.64
1936	: 10,451,958	: 387,741	: 483,556	: 126,410	: 26.14
1937	: 12,340,830	: 427,344	: 570,155	: 156,579	: 27.46
1938	: 11,600,132	: 443,813	: 537,025	: 183,278	: 34.13
1939	: 13,100,300	: 469,183	: 605,644	: 210,627	: 35.49
1940	: 14,717,511	: 505,111	: 679,841	: 213,099	: 31.96
:	:	:	:	:	:

Source: Mountain Fuel Supply Company, A Message of Vital Importance to every User of Coal or Gas in Utah.

Table 13 shows the taxes paid by the coal industry in the State of Utah for the years 1925 to 1940.

Table 13. Total general property tax and taxes per ton of coal mined for the Utah coal industry, 1925 to 1940.

Year	General prop- erty taxes	Production in tons	Tax per ton in cents
1925	\$389,039	4,690,342	8.29
1926	381,147	4,373,793	8.71
1927	383,290	4,781,480	8.02
1928	374,764	4,842,544	7.74
1929	392,193	5,160,521	7.59
1930	414,058	4,257,541	9.73
1931	418,948	3,350,044	12.51
1932	404,648	2,852,127	14.19
1933	373,455	2,674,986	13.96
1934	386,292	2,406,183	16.05
1935	370,049	2,946,918	12.56
1936	283,940	3,246,565	8.75
1937	287,400	3,809,476	7.54
1938	271,727	2,946,951	9.22
1939	262,663	3,340,000	7.86
1940	242,117	3,500,000	6.92

Source: Mountain Fuel Supply Company, A Message of Vital Importance to Every User of Coal or Gas in Utah.

Table 14 is a combination of the data presented in the two previous tables. By combining this information into parallel columns we get some conception of tax per ton of coal and per equivalent ton of gas for the combined coal companies and for the gas company of Utah.

An inspection of the last two columns in table 14 shows that from the standpoint of general property taxes alone, when compared on a tonnage basis, gas is carrying approximately four and one-half times the burden of taxation that coal carries. Since these data were compiled by the gas com-

Table 14. A comparison of the taxation of coal and gas in Utah, 1929 to 1940.

Year	Assessed valuation		Gen. prop. taxes		Tax per ton	
	Coal	Gas	Coal	Gas	Coal	Gas
1929	\$15,208,759	\$2,050,430	\$392,193	\$ 70,783	7.59¢	
1930	15,292,030	3,912,971	414,058	119,876	9.73	72.58¢
1931	14,711,203	3,458,607	418,948	108,501	12.51	49.22
1932	14,409,273	3,473,985	404,648	107,953	14.19	41.78
1933	12,537,856	3,413,615	373,455	109,590	13.96	40.51
1934	12,170,724	3,412,099	386,292	112,678	16.05	36.87
1935	12,921,555	4,183,825	370,049	138,389	12.56	34.64
1936	10,874,022	4,182,484	283,940	126,410	8.75	26.14
1937	10,424,287	4,890,766	287,400	156,579	7.54	27.46
1938	9,568,248	5,695,293	271,727	183,278	9.22	34.13
1939	8,438,025	5,988,962	262,663	210,627	7.86	35.49
1940	7,993,519	6,109,078	242,117	213,099	6.92	31.96

Source: Mountain Fuel Supply Company, A Message of Vital Importance to Every User of Coal or Gas in Utah.

pany, it was well that the companies carried their arguments no further. The figures are accurate, but the impression they leave with the reader is far from realistic.

The general property tax on gas is more inclusive than the tax on coal. It includes a tax on the productive equipment at the well, on the transmission equipment, and on the entire distribution system. All of the property taxes incident to production and distribution of gas are added up, and the tax cost per equivalent ton of coal was 31.96 cents in 1940.

The data for coal are not so inclusive. It cannot be assumed that coal is transported tax free, because railroads pay heavy property taxes also, and these taxes come out of the rates charged for transporting coal and other products. One of the most important sources of railroad revenue is the coal traffic. It seems logical to conclude, therefore, that

the railroads add an important tax cost to the coal purchased by the consumers. Retail and wholesale agencies each pay heavy property taxes on their property and equipment. Theoretically, at least, distributors recoup these expenditures out of coal sales. The addition of transportation and distribution tax costs to the production tax costs would raise the total tax per ton of coal considerably above the 6.92 cents of 1940.

Unfortunately, we have no reliable information on the total tax cost of producing and marketing Utah coal. Calculations made by the Utah Coal Operators' Association for the year 1936 placed the total tax at \$2,035,000.¹⁸ This is an enormous increase in taxes over \$283,940 paid by the mines in 1936. But if we assume that the operators correctly calculated all the tax costs of 1936, we discover that the total cost for taxes per ton of coal amounted to approximately 31.90 cents per ton.¹⁹ This figure is more than five cents higher than the tax per equivalent ton of gas in 1936. However, no emphasis can be placed upon this analysis for two reasons: (1) the accuracy of the data has not been verified, and (2) data for a single year do not present any basis for generalizations. It does seem evident, though, that taxes on distribution would exceed in amount the taxes on mining equipment and land.

On this point, one other fact should be recognized: that is, 45 percent of the coal which Utah produces is sold in other

18 From the files of Senator George M. Miller of Carbon County.

19 \$1,035,000 divided by 3,246,565 tons.

states. The taxes on the distribution of Utah coal would not include those taxes paid on transportation and retailing outside the state of Utah. By spreading the distribution costs in Utah over only that percentage of Utah coal that is consumed in the state, the tax per ton is raised somewhat.

It must be said of gas, also, that the company in 1940 actually paid \$56,627.68 in property taxes in Colorado and Wyoming, and \$19,639.00 as royalties to the federal government.²⁰ These taxes have not been taken into consideration because nearly 230 million cubic feet of gas were sold to customers in Wyoming, and because we have not taken into account the royalties on Utah coal, which would be many times greater than the gas royalties. It may be that Wyoming consumers do not pay all of the tax which Colorado and Wyoming assessed against the gas company. In that case, some of these taxes are probably shifted to the Utah consumers. We are not prepared to answer this question.

If we compare the property tax in cents per dollar of gross income for 1938 and 1939 for tons of coal and the gas equivalent, we get the following relationship:

	1938	1939
Coal	4.00	3.15
Gas	6.91	7.24

These figures do not show any overtaxation of coal as compared with gas. However, they cover only a short period, and they do not take into consideration other taxes that are subsequently added to coal. But compared on a dollar of gross

²⁰ Mountain Fuel Supply Company, op. cit., pp. 9 and 11.

revenue basis, the other taxes should not seriously change the relationship, since the coal also increases in value as it moves nearer the market.

Deductions. In view of our analysis, which has by no means been complete or exhaustive, we present the following deductions:

(1) That gas is not a tax-free fuel even though no assessment is made directly against the product.

(2) That the property tax appears to be just as burdensome to the gas utility as it is to coal companies.

(3) That compensation and social security taxes rest more heavily on coal than on gas.

(4) That natural gas is sold for industrial purposes at a price which coal producers cannot meet.

(5) That natural gas has reduced employment in Utah, and possibly total employment.

(6) That the coal industry has suffered from loss of markets to gas.

(7) That the present plight of the Utah coal industry is not "mainly" due to the gas invasion.

(8) That the increased tax on gas, for which the coal industry has been clamoring, may be justified from the standpoint of regulation, but not on the basis of uniformity.

There is a need for a more complete analysis on this problem. Each industry pays many taxes in addition to the general property tax. These, also, should be studied carefully. Furthermore, it seems that very little attention has

been given to the problem determining the tax burden of a given product; and yet, to make intelligent comparisons between the tax burden of two competing products, such as gas and coal, it is important to know just how much is added to the tax cost of coal by each distributive agency. Otherwise, comparable data are not available to compare uniformity. Analyses, therefore, often merely conjecture and fail to solve problems.

CONCLUSIONS AND RECOMMENDATIONS

Although the Utah coal industry is in a distressed economic condition, there seems to be no justification for assuming that the property tax is at fault. The coal producers have not been singled out for a special tax burden. Their special formula of assessment has been flexible enough to be adjusted to the changed economic conditions which have threatened the industry. With the exception of a few depression years when the average tax per ton of coal mined almost doubled, the tax burden on coal mines has been reasonably uniform.

The fact that taxes on coal deposits and mining equipment have been adjustable is highly significant in view of the revolutionary changes which have taken place in the industry. The ad valorem procedure of taxing coal mines was formulated in 1919, one of the last years of a rising production trend. Carefully as the formula was worked out, it was still calculated largely in terms of a continuous prosperity for the coal industry. But the very opposite occurred. Production declined, leaving the mines tremendously overcapitalized. Had the tax procedure proved too rigid to be modified, disastrous effects might have resulted. The actual tax per ton of coal mined in 1940 was as low as for any year since 1921, although the economic changes which have upset the equilibrium of coal production undoubtedly have forced the companies to assume more of the incidence of their tax.

The taxing procedure has also had other good effects. Ad valorem taxes on natural resources are frequently criticized on the ground that they force production to offset the tax load, thus resulting in wasteful exploitation. Although this is a valid criticism (and we are unprepared to say how much practical effect this tendency has had in Utah), it does appear that certain regulatory aspects of the tax counteract over-production tendencies to a large extent.

There is much evidence to sustain the conclusion that tax-burden uniformity in Utah is more of an ideal than a reality, but still we can find no evidence to warrant the conclusion that coal operators are paying more in taxes than their competitors on leased lands pay in royalties. Furthermore, no obvious discrimination against coal in comparing the property tax on coal with that of gas was discoverable. While it is a fact that natural gas has reduced the demand for coal, displaced mine employees, reduced railroad revenue, and threatened the prosperity of many Utah communities, there seem to be no grounds for asserting that gas has made these gains because of preferential tax treatment.

To sum up: The plight of the coal industry appears to be a function of over-development and over-capitalization, although fuel efficiencies and displacement by other fuels has complicated the problem. Government insistence during the World War did result in some expansion, but with an expanding production trend and high coal prices it is doubtful that enterprisers needed much urging. In any case, the expansion in

mining facilities which continued right up to the depression can hardly be attributed to governmental insistence. Realistically speaking, the over-capacity is due mainly to unjustified optimism on the part of mining companies and the abundance of easily developed coal resources.

The problem of excess productive capacity is a disturbing factor. Four mines could easily produce all the coal that is necessary to supply the market for Utah coal. But, instead of only four mines, there are more than 90 mines equipped for operations in Utah. Such a set-up naturally leads to cut-throat competition with the result that the whole industry suffers. In correcting this menace, some headway is being made through trade associations and federal regulation. Theoretically, the solution to this problem would be to close down all the mines that are not profitable and allow only a few of the more efficient operators to supply the entire market. With a well-organized group of efficient producers, coal could meet the challenge of gas and other substitutes; and the competition between gas, oil, electricity, and coal would still protect the consumer against excessive prices. The present loose and inefficient organization of the coal companies, however, cannot hope to compete with the streamlined monopolistic organization of the gas company.

Reducing the coal industry to a compact group of efficient mines is impossible under a system of free competition. An individual has the constitutional right to engage in any occupation he desires so long as he does not infringe on the

property rights and lives of other people.

In view of the fact that the coal problem is national in scope, there is little possibility that any solution can be worked out for Utah alone. It is doubtful that any real solution will be forthcoming until new uses are discovered for the product. In the meantime the industry will have its scapegoats: excessive taxes, undertaxed competitors, and many others. At present, however, there seems to be no evidence of either an excessive tax burden or tax discrimination. The coal industry, freed from all taxes would still be hobbled by its over-capacity and inefficiency.

SUMMARY

1. It is difficult to fit mine taxation into any system of general business taxation. Therefore, most states with mineral wealth have adopted special procedures for taxing mining properties.

2. Utah adopted a special ad valorem assessment formula for taxing coal mines in 1919.

3. Assessing coal deposits in a technical process. Since coal is hidden from sight, it is difficult to measure its accessible tonnage and quality.

4. The value of coal in Utah is based on an extensive geological survey. More than 100 billion tons of Utah coal were measured and mapped before any assessment values were worked out.

5. Determining ton-values after the geological survey was completed also was a technical problem. Much economic data were assembled and weighted in ascertaining fair ton-values. Such problems as calculating the average tonnage that it would be practical to extract, determining deferred values, and equalizing tax burdens were exceedingly complicated.

6. Coal operators on leased land pay a ten-cent royalty to the federal government on each ton of extracted coal. It was originally intended that the tax on coal mines should be equally burdensome.

7. All coal lands in Utah were divided into 40-acre tracts and classified according to the theory that the most

accessible coal would be mined first. Those divisions which were being operated or were adjacent to an operating mine or railroad were assigned the highest ton-values.

8. The fact that the procedure would need to be adjusted and modified to meet unforeseen changes was recognized by those who formulated the plan.

9. In addition to an assessment on coal deposits, equipment and improvements are also assessed on an ad valorem basis. About 40 percent of coal mine taxes are based on this type of property.

10. The equilibrium of coal production was upset shortly after 1919. Industrial expansion outran actual demand. This factor, together with fuel efficiencies and loss of markets to competitive fuels, left the coal industry in a precarious economic condition.

11. Over-expansion was mainly due to over-optimism, the abundance of coal, the ease of development, seasonal demand, World War demand, and promotional schemes.

12. The coal industry now has many more mines and much more equipment than is ever used. Since coal deposits and equipment are assessable whether they are productive or idle, it is obvious that the tax cost per ton of coal mined is higher than it would be if mines and equipment were limited to that which is productive.

13. Utah mines are trying to meet competition through mechanizing the extraction and preparation processes, while

this program increases efficiency, it also enlarges the tax base.

14. The tax burden does not rest uniformly on all coal companies. Differences in burden are largely a result of the various policies of individual companies with respect to land reserves and capitalization.

15. More important than the variations in the tax burden, are the variations in the average burden of all coal mines in different years. While the former differentials are mainly a result of company policies, the latter are a function of the taxing procedure.

16. Most complaints against the method of taxing coal mines are based on company differences rather than on fundamental injustices.

17. In only five depression years has the average tax burden per ton of coal mined exceeded the royalty of ten cents per ton.

18. The fact that the direct burden of the tax has been held within reasonable bounds despite the decline in production to less than half that of 1920 can be attributed to a large extent to the reduction in assessment values in 1933 and 1936.

19. Even in the depression years it is doubtful that the ad valorem tax burden on coal mines was heavier than those borne by other classes of property that were assessed on the same basis.

20. Although economic changes have disrupted the industry, it seems that the ad valorem system has flexibility

enough to meet these changes.

21. The direct tax burden in 1940 was less per ton of coal mined than in any year since 1920. However, the demand for coal has become more elastic as a result of fuel efficiencies and fuel substitutes. Over-capitalization and continued mechanization have transformed coal production into a decreasing-cost industry. Since the capital is fixed and specialized, it is more immobile than the hand tools of the past. All of these factors have forced the industry to assume more of the incidence of their tax.

22. Ad valorem taxes on natural resources have been criticized on the ground that they force production to offset the tax load.

23. Requiring the highest rate of taxation on those 40-acre tracts which have an opening to the coal seam effectively prevents the opening of mines on all outcrops.

24. Conservation is also encouraged in that Utah taxes only 63 percent of the actual coal in each deposit. The 37 percent is considered a legitimate waste. This percentage has some practical effect in that companies mine clean in an effort to recover as much tax-free coal as possible. Production taxes provide no such incentive.

25. Monopolistic control of land is prevented in that coal deposits are taxed whether they are being mined or not. Since current production must carry the tax burden of reserve land as well as productive land, reserve land must be reasonable to prevent tax costs from becoming exorbitant.

26. Coal mine taxes have been easy to collect and are a dependable source of revenue.

27. While ad valorem assessments on all classes of property have been a stable source of revenue for the state, taxes based on net proceeds have fluctuated violently. This is one important example of unequal treatment.

28. The problem of equating taxes is important in view of the fact that inequalities may seriously handicap the industry that is being given discriminatory treatment, and may unwittingly sponsor the activities of a competitor.

29. Although there is definite evidence that the gas industry in Utah has displaced coal, labor, and railroad traffic, and thereby has seriously affected the economic condition of many Utah communities, these arguments are not prima facie evidence that gas is being given preferential tax treatment.

30. Comparisons of taxes per ton of coal and per equivalent ton of gas show no evidence of discrimination against coal.

31. Likewise, comparisons between gas and coal on the basis of tax cents per dollar of gross income reveal no serious inequalities.

32. Increased taxes on gas may be justified from the standpoint of regulation, but not on the basis of uniformity.

33. In view of this analysis, there is no evidence that coal taxes are either excessive or discriminatory.

34. The basic causes of the economic plight of the mines are not taxes, but over-capacity and inefficiency. These problems are common to the coal industries in all localities.

APPENDICES

Appendix A. Production and a five-year average of production in thousands of tons for Utah coal mines, 1900 to 1940

Year	Production	5-year total	5-year average
1900	1,234		
1901	1,382		
1902	1,641	7,602	1,520
1903	1,782	7,971	1,594
1904	1,563	8,428	1,686
1905	1,603	8,755	1,764
1906	1,839	8,818	1,751
1907	1,968	9,577	1,915
1908	1,845	10,500	2,100
1909	2,322	11,174	2,235
1910	2,526	12,014	2,403
1911	2,513	13,424	2,685
1912	2,808	14,205	2,841
1913	3,255	14,788	2,958
1914	3,103	15,842	3,168
1915	3,109	17,159	3,432
1916	3,567	19,041	3,808
1917	4,125	20,569	4,114
1918	5,137	23,465	4,693
1919	4,631	23,977	4,795
1920	6,005	24,844	4,969
1921	4,079	24,427	4,885
1922	4,992	22,969	4,594
1923	4,720	23,264	4,653
1924	4,488	23,053	4,611
1925	4,690	23,176	4,635
1926	4,374	23,849	4,770
1927	4,781	23,624	4,683
1928	4,843	23,417	4,479
1929	5,161	22,393	4,093
1930	4,258	20,464	3,659
1931	3,350	18,296	3,108
1932	2,851	15,541	2,846
1933	2,675	14,230	2,825
1934	2,406	14,127	3,017
1935	2,947	15,085	3,062
1936	3,247	15,318	3,250
1937	3,810	16,252	3,366
1938	2,908	16,829	
1939	3,340		
1940	3,524		

Source: Minerals Yearbooks 1934 to 1940

Appendix B. Average monthly production and monthly indices of production for Utah and the United States, 1935 to 1940

Month	Utah		United States	
	:Average output: :in thousands : of tons	:Index of :production:	:Average output: : in thousands : of tons	: Index of :production:
Average	263	100	37,378	100
January	385	145	41,438	111
February	380	143	42,661	114
March	261	98	48,935	131
April	168	63	32,213	86
May	137	52	30,271	81
June	124	47	31,988	86
July	128	48	32,184	86
August	183	69	34,187	91
September	278	105	39,428	105
October	358	135	41,110	110
November	372	140	36,699	98
December	401	151	37,417	100

*

Source: Minerals Yearbooks, 1936 to 1940

Appendix C. Excess capacity of Utah coal mines in thousands of tons and percent, 1915 to 1940

Year	*Total output	: Avg. number of mines operated	: Avg. daily output in thou- sands	: Fulltime capacity based on a 308-day year	: Capacity based on a 260-day year	: Percent of excess capacity	: Percent of Full day
1915	3,109	208	15.0	4,620	3,915	48.6	25.9
1916	3,567	228	15.7	4,836	4,082	35.6	14.4
1917	4,125	219	18.8	5,790	4,888	40.4	18.5
1918	5,137	258	19.9	6,129	5,174	19.3	.7
1919	4,631	247	18.8	5,790	4,888	25.0	5.5
1920	6,005	252	23.8	7,330	6,188	22.1	3.0
1921	4,079	151	27.0	8,316	7,020	103.9	72.1
1922	4,992	204	24.5	7,546	6,370	52.2	27.6
1923	4,720	160	29.5	9,086	7,670	92.5	62.5
1924	4,488	182	24.7	7,608	6,422	69.5	43.1
1925	4,690	179	26.2	8,070	6,812	72.1	45.2
1926	4,374	186	23.5	7,238	6,110	65.5	39.7
1927	4,781	209	22.9	7,053	5,954	47.5	24.5
1928	4,843	191	25.4	7,823	6,604	61.5	36.4
1929	5,161	211	24.5	7,546	6,370	46.2	23.4
1930	4,258	168	25.4	7,823	6,604	83.7	55.1
1931	3,350	148	22.6	6,961	5,876	106.9	75.4
1932	2,852	176	16.2	4,990	4,212	75.0	47.7
1933	2,675	176	15.2	4,682	3,952	75.0	47.7
1934	2,406	171	14.1	4,343	3,666	80.5	52.4
1935	2,947	188	15.7	4,836	4,192	64.1	42.2
1936	3,247	186	17.1	5,267	4,446	62.2	36.9
1937	3,810	189	20.2	6,222	5,252	63.4	37.8
1938	2,908	156	18.7	5,760	4,862	98.1	73.1
1939	3,340	167	20.0	6,160	5,200	84.4	55.7
1940	3,524	175	20.1	6,191	5,226	75.7	48.3
Total	104,019	4,985	545.5	168,016	141,955		
Avg.	4,001	192	21.0	6,462	5,460	64.3	39.0

*Source: Investigating Committee of Utah Governmental Units, An Economic Study of the Development of Utah's Coal Resources, appendix

Appendix D. Percentage of Btu equivalent contributed by the mineral fuels and water power in the United States, 1899 to 1940

Year	Anthracite	Bituminous	Oil	Gas	Water power
1899	20	72	4	2	2
1909	22	68	5	3	2
1913	16	70	8	3	3
1918	14	70	9	4	3
1921	12	69	11	4	4
1922	13	69	9	4	5
1923	8	60	22	5	5
1924	10	61	19	5	5
1925	11	57	21	5	6
1926	8	60	21	6	5
1927	9	60	20	6	5
1928	9	53	23	7	8
1929	8	53	24	8	7
1930	8	51	27	7	7
1931	8	49	25	9	9
1932	8	45	26	10	11
1933	7	45	29	9	10
1934	8	45	28	10	9
1935	7	45	29	9	10
1936	6	47	28	10	9
1937	5	46	30	10	9
1938	6	40	32	11	11
1939	6	42	31	11	10
1940	6	42	32	10	10

Source: Minerals Yearbooks, 1934 to 1940

Appendix E. Coal production, operating costs, and all mining costs of Utah mines for the months of April to December 1937, and the year 1936

	: Production :	: Produc- tion : index :	: Per ton : operat- : ing costs :	: Per ton : Operat- : ing cost: : index :	: All min- : ing costs : per ton :	: Mining : costs : index :
Average	: 226,286 :	: 100 :	: 1.33 :	: 100 :	: 2.18 :	: 100 :
April	: 131,597 :	: 57 :	: 1.47 :	: 111 :	: 2.71 :	: 124 :
May	: 111,862 :	: 49 :	: 1.60 :	: 120 :	: 2.90 :	: 133 :
June	: 145,641 :	: 64 :	: 1.47 :	: 111 :	: 2.58 :	: 118 :
July	: 178,634 :	: 79 :	: 1.40 :	: 105 :	: 2.39 :	: 110 :
August	: 235,543 :	: 104 :	: 1.33 :	: 100 :	: 2.16 :	: 99 :
September	: 330,061 :	: 141 :	: 1.26 :	: 95 :	: 1.98 :	: 91 :
October	: 375,768 :	: 163 :	: 1.28 :	: 96 :	: 1.98 :	: 91 :
November	: 338,752 :	: 149 :	: 1.29 :	: 97 :	: 2.04 :	: 94 :
December	: 388,702 :	: 172 :	: 1.23 :	: 92 :	: 2.02 :	: 93 :
Avg. 1936:	: 259,501 :	: 119 :	: 1.25 :	: 94 :	: 2.01 :	: 92 :

Source: Report of the National Bituminous Coal Commission

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