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## The Economic Interest Concept: A Historical and Policy Perspective

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# The Economic Interest Concept: A Historical and Policy Perspective

BY EDMUND D. FENTON, JR., DBA, CPA\*  
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## INTRODUCTION

The concept of economic interest is a very complex and crucial issue, the understanding of which is a prerequisite for proper planning in natural resource taxation.<sup>1</sup> The concept controls the allowance of the depletion deduction<sup>2</sup> and, in

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<sup>1</sup> See Sneed, *The Economic Interest - An Expanding Concept*, 35 TEX. L. REV. 309 (1957). The author states in pertinent part:

[T]hese are weary thoughts of one who has, with no little grimness, just completed the examination of many judicial and administrative pronouncements concerning the nature of the most ubiquitous concept in the income tax law of mineral interests - the economic interest. Their jaded tone should not mislead the reader. An understanding of this concept is the bedrock upon which any reasonably thorough appreciation of mineral tax law must be built. Grasp the economic-interest notion and many arcane aspects of this highly glamorous field will stand revealed.

*Id.* at 309.

<sup>2</sup> Treas. Reg. § 1.611-1(b)(1) (as amended in 1973) states: "Annual depletion deductions are allowed only to the owner of an economic interest in mineral deposits or standing timber." This regulation relates to both cost depletion and percentage depletion.

certain mineral transactions, determines whether a sale or a lease has occurred.<sup>3</sup> Additionally, for windfall profit tax purposes, any liability rests with the producer as a result of possessing an economic interest in the oil in place.<sup>4</sup>

While economic interest relates to several different areas of mineral tax law, its initial development began with the depletion allowance for oil and gas as introduced by the Supreme Court in the landmark decision of *Palmer v. Bender*.<sup>5</sup> Although *Palmer* is the foundation for any analysis of economic interest, the concept has undergone a continuing evolutionary process. Since the Internal Revenue Code (Code) and the related Treasury regulations encompassing this issue have provided very little guidance, developments have generally resulted from judicial decisions.<sup>6</sup> A review of the judicial development of economic interest is essential to its understanding and applicability to the multifarious transactions occurring in the mineral area.

This Article will examine the historical aspect of the economic interest concept beginning with the early statutory framework of the depletion allowance. Next, several significant Supreme Court cases will be discussed to illustrate both the evolution of the concept in tax law, and its illusory nature for which it is known.<sup>7</sup> The policy considerations relating to depletion and economic interest will be examined along with an analysis of the application of the policy by the Tax Court. Before the historical and policy considerations are presented,

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<sup>3</sup> See Treas. Reg. § 1.631-3(a) (as amended in 1980).

<sup>4</sup> I.R.C. § 4996(a)(1)(A) (West Supp. 1987); Treas. Reg. § 51.4996-1(b)(1) (as amended in 1986). To determine if a production payment qualifies as an economic interest, see I.R.C. § 636 (West Supp. 1987); Treas. Reg. § 1.636-1 (1973); Treas. Reg. § 1.636-2 (1973); Treas. Reg. § 1.636-3 (1973). Section 636 states that generally a retained production payment is not considered an economic interest unless: (1) the proceeds are pledged for the exploration or development of the mineral, or (2) the production payment was retained by the lessor in a leasing arrangement. I.R.C. § 636 (West Supp. 1987).

<sup>5</sup> 287 U.S. 551 (1933).

<sup>6</sup> See generally I.R.C. § 611(a) (West 1967); Treas. Reg. § 1.611-0 (1968); Treas. Reg. § 1.611-1 (as amended in 1973). Treas. Reg. § 1.611-1(b)(1) provides a general definition of economic interest that is difficult to apply to many natural resource transactions.

<sup>7</sup> See C. RUSSELL & R. BOWHAY, *INCOME TAXATION OF NATURAL RESOURCES* ¶ 2.09 (1987) (describing the economic interest concept as illusory).

the Article will present a detailed analysis of the treatment of the economic interest concept in the current Code<sup>8</sup> and Regulations.<sup>9</sup>

## I. ECONOMIC INTEREST IN CURRENT TAX LAW

Economic interest is a broad concept encompassing a variety of property interests.<sup>10</sup> The specific type of property interest present in a transaction depends on the division of the mineral rights for a particular tract of land containing the oil, gas, or solid minerals in place.<sup>11</sup> These different property interests make possible the various arrangements encountered in the natural resource area, the tax consequences of which are governed by the presence or absence of economic interest.

### A. Definition

The general definition of an economic interest is provided in the Treasury regulations:

An economic interest is possessed in every case in which the taxpayer has acquired by investment any interest in mineral in place or standing timber and secures, by any form of legal relationship, income derived from the extraction of the mineral or severance of the timber, to which he must look for a return of his capital.<sup>12</sup>

This definition contains two important factors: 1) investment and 2) income, both of which are necessary for establishing an economic interest.

To satisfy the first factor of the definition, the investment must be in the mineral before its removal. Investment merely

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<sup>8</sup> I.R.C. § 631(b) & (c) (West Supp. 1987).

<sup>9</sup> Treas. Reg. § 1.611-1 (as amended in 1973).

<sup>10</sup> See Russell & R. Bowhay, *supra* note 7.

<sup>11</sup> See *id.* at ¶¶ 2.02-2.08 (stating that the types of interests are: (1) mineral interest, (2) royalty interest, (3) working or operating interest, (4) overriding royalty, (5) net profits interest, (6) production payment, and (7) carried interest). For an excellent discussion of the operating interest, see Rigsby, *The Operating Interest: An Essential Element In Deducting Mining Exploration and Development Costs?*, 1 J. MIN. L. & POL'Y 21 (1985).

<sup>12</sup> Treas. Reg. § 1.611-1(b)(1) (as amended in 1973).

in producing equipment or immovable assets will not suffice.<sup>13</sup> However, whether an investment exists can sometimes be difficult to discern since the investment in the mineral does not have to be a monetary one,<sup>14</sup> but it must at least be a legal investment.<sup>15</sup> The main criterion for an appropriate investment apparently pertains to possessing a "value" which will decrease upon the extraction and sale of the mineral deposit.<sup>16</sup>

The income factor of the definition of economic interest focuses on how the proceeds are actually derived from the mineral sale. Generally, for economic interest to be present, the amounts to be realized must be contingent rather than involve a guaranteed lump sum paid without regard to the quantity of the mineral extracted.<sup>17</sup> For a taxpayer already owning an economic interest (e.g., owner of a mineral deposit), the proceeds may consist of a fixed amount per unit as long as it is tied to production quantity,<sup>18</sup> or it may be an amount connected to a share of the proceeds from production and mineral sale.<sup>19</sup> In both situations the total dollar amount of the proceeds is not guaranteed; thus, a contingency is present. For a taxpayer attempting to acquire an economic interest not already possessed (e.g., a contract miner), the proceeds should be tied to the market price, thereby establishing the contingency.<sup>20</sup> Therefore, having the correct type of income source, in addition to an appropriate investment, is necessary to distinguish a true economic interest from similar arrangements.<sup>21</sup>

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<sup>13</sup> *Helvering v. Bankline Oil Co.*, 303 U.S. 362, 368 (1938).

<sup>14</sup> See *Commissioner v. Southwest Exploration Co.*, 350 U.S. 308, 316 (1956); see *infra* note 148 and accompanying text.

<sup>15</sup> See *Harrington, Jr. v. Commissioner*, 404 F.2d 237, 239 (5th Cir. 1968).

<sup>16</sup> See G.C.M. 22,730, 1941-1 C.B. 214, 215-16.

<sup>17</sup> For cases involving lump sum payments, see, e.g., *Day v. Commissioner*, 54 T.C. 1417 (1970); *Rhodes v. United States*, 464 F.2d 1307 (5th Cir. 1972).

<sup>18</sup> This type of arrangement is a basic royalty interest.

<sup>19</sup> See *Kirby Petroleum Co. v. Commissioner*, 326 U.S. 599, 604 (1946); *Burton-Sutton Oil Co. v. Commissioner*, 328 U.S. 25 (1946). *But cf.* *Helvering v. Elbe Oil Land Dev. Co.*, 303 U.S. 372 (1938). Examples of these types of arrangements are net profits interests and production payments.

<sup>20</sup> *United States v. Swank*, 451 U.S. 571, 583 (1981).

<sup>21</sup> *Treas. Reg.* § 1.611-1(b)(1) (as amended in 1973) (A "person who has no capital investment in the mineral deposit . . . does not possess an economic interest merely because through a contractual relation he possesses a mere economic or pecuniary advantage derived from production.").

## *B. Depletion*

For depletion purposes, the Code allows a deduction based on a reasonable amount of the mineral's cost computed by taking into consideration the peculiar conditions in each case.<sup>22</sup> This deduction, however, can only be claimed by taxpayers owning an economic interest in the natural resource deposit.<sup>23</sup> The depletion deduction amount is computed under two alternative methods: cost depletion and percentage depletion. Cost depletion is based on the cost of acquiring the natural resource itself, or the cost of acquiring the rights to extract the resource.<sup>24</sup> Percentage depletion, with certain limitations, is generally computed by means of applying a specific percentage to the income derived from the resource.<sup>25</sup> The larger of the two amounts determined under the above alternatives is required to be used as the depletion deduction actually taken.<sup>26</sup> The possession of an economic interest is the key to securing an important tax deduction, made even more valuable when percentage depletion is in excess of cost depletion.<sup>27</sup>

## *C. Capital Gains*

In addition to controlling the depletion deduction, economic interest has been important in characterizing the nature of a transaction as a sale or a lease when disposing of natural

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<sup>22</sup> I.R.C. § 611(a) (West 1967).

<sup>23</sup> Treas. Reg. § 1.611-1(b)(1) (as amended in 1973).

<sup>24</sup> See I.R.C. § 612 (West 1967); Treas. Reg. § 1.612-1 (1960); Treas. Reg. § 1.612-2 (1960); Treas. Reg. § 1.612-3 (as amended in 1977); Treas. Reg. § 1.612-4 (1965); Treas. Reg. § 1.612-5 (1982).

<sup>25</sup> See I.R.C. § 613 (West Supp. 1987); I.R.C. § 613A (West Supp. 1987); Treas. Reg. § 1.613-1 (as amended in 1972); Treas. Reg. § 1.613-2 (as amended in 1977); Treas. Reg. § 1.613-3 (as amended in 1968); Treas. Reg. § 1.613-4 (1972); Treas. Reg. § 1.613-5 (as amended in 1972); Treas. Reg. § 1.613A-1 (1977).

<sup>26</sup> I.R.C. § 613(a) (West Supp. 1987).

<sup>27</sup> The Tax Reform Act of 1975 repealed the percentage depletion provisions for domestic and foreign oil and gas production with several exceptions. I.R.C. § 613A (West Supp. 1987) provides for a current 15% rate for regulated natural gas sold under a fixed contract, natural gas from geopressured brine, and independent producers and royalty owners up to 1,000 barrels of oil per day, or up to 6,000 cubic feet of natural gas per day.

resource property. Prior to the Tax Reform Act of 1986,<sup>28</sup> some taxpayers desired to have a transaction classified as an exchange of a capital asset due to the very preferential treatment afforded long-term capital gains.<sup>29</sup> To accomplish this result with transfers of most mineral properties, the economic interest could not be retained since to do so would cause the transaction to be characterized as a lease rather than a sale.<sup>30</sup> Transactions involving coal or domestic iron ore, however, are treated differently. If the economic interest is retained upon the transfer of those mineral properties, the property is categorized as a section 1231 asset resulting in capital gain potential.<sup>31</sup> Thus, identifying either the transfer or retention of economic interest is essential for proper structuring of the natural resource arrangements.

## II. HISTORICAL DEVELOPMENT OF PERCENTAGE DEPLETION

The economic interest concept was introduced by the Supreme Court in 1933 in *Palmer v. Bender*<sup>32</sup> while attempting to explain which taxpayers were allowed a depletion deduction in certain complex mineral transactions.<sup>33</sup> Since the deduction was not limited to the cost of the property interests, the depletion allowance had become quite attractive.<sup>34</sup> In the early revenue acts, however, the depletion allowance was not as generous.<sup>35</sup>

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<sup>28</sup> Tax Reform Act of 1986, Pub. L. No. 99-514, 100 Stat. 2085.

<sup>29</sup> The Tax Reform Act of 1986 repealed the sixty percent deduction available for long-term capital gains, which was previously granted by I.R.C. § 1202(a) (West 1967). Even after this change, taxpayers will still have an incentive to classify a gain as a long-term capital gain if large capital losses are present. I.R.C. § 1211(b)(1) (West Supp. 1987) has retained the \$3,000 per year net capital loss deduction limitation for individuals.

<sup>30</sup> See generally *United States v. White*, 401 F.2d 610 (10th Cir. 1968), *rev'g* 254 F. Supp. 894 (D. Colo. 1966); Rev. Rul. 69-466, 1969-2 C.B. 140; Rev. Rul. 82-221, 1982-2 C.B. 113. For most types of minerals, if an economic interest is retained upon transfer of the mineral rights, the resulting income is royalty income. Conversely, if the economic interest is transferred along with the mineral rights transfer, a capital asset sale occurs if the property was a capital asset in the hands of the taxpayer.

<sup>31</sup> See I.R.C. § 631(c) (West Supp. 1987); I.R.C. § 1231(b)(2) (West 1967); Treas. Reg. § 1.631-3 (as amended in 1980).

<sup>32</sup> 287 U.S. 551 (1933).

<sup>33</sup> *Id.* at 558.

<sup>34</sup> See *infra* note 53 and accompanying text.

<sup>35</sup> See *infra* notes 36-49 and accompanying text.



### A. Early Revenue Acts

In drafting the Tariff Act of 1909,<sup>36</sup> which contained the taxing of corporate income,<sup>37</sup> Congress did not include a provision for allowing a deduction based on the depletion of natural resources. A depreciation deduction for other assets was allowed,<sup>38</sup> however, and while it is not known whether Congress intentionally left out a depletion allowance, the Supreme Court applied the statutes literally and denied depletion in two tax cases arising under the Act.<sup>39</sup>

With the ratification of the sixteenth amendment,<sup>40</sup> the Tariff Act of 1913<sup>41</sup> introduced the initial depletion deduction.<sup>42</sup> From that point the allowance was regarded as a matter of legislative grace.<sup>43</sup> The deduction under this Act was to be a "reasonable allowance" for the exhaustion and wear and tear of the property, but the amount was limited to only five percent of the gross value of production.<sup>44</sup> Congress had recognized the special circumstances of the mining industry; the value of an investment in natural resource property declines as the mineral is removed, thus, an allowance for that decline is justified since taxable income would be recognized from the property. Notwithstanding the fact that depletion was allowed, it might have been added to the Act as an afterthought,<sup>45</sup> and it was possible that the modest limitation of five percent of

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<sup>36</sup> Tariff Act of 1909, Pub. L. No. 61-5, 36 Stat. 11.

<sup>37</sup> *Id.* § 38, 36 Stat. 11, 112.

<sup>38</sup> *Id.* § 38, 36 Stat. 11, 113.

<sup>39</sup> *Stratton's Independence v. Howbert*, 231 U.S. 399 (1913); *Von Baumbach v. Sargent Land Co.*, 242 U.S. 503 (1917).

<sup>40</sup> U.S. CONST. Amend. XVI. The Sixteenth Amendment provides that "[t]he Congress shall have the power to lay and collect taxes on incomes, from whatever source derived, without apportionment among the several States, and without regard to any census or enumeration." *Id.*

<sup>41</sup> Tariff Act of 1913, Pub. L. No. 63-16, 38 Stat. 114, 166.

<sup>42</sup> Several prior authors have indicated that the term "depletion" did not appear in the statutes until the Revenue Act of 1916, 39 Stat. 756. See Baker, *The Nature of Depletable Income*, 7 TAX L. REV. 267, 269 (1952); Disney, *The Depletion Allowance*, 16 TAX MAG. 262, 264 (1938). Actually, however, the term did appear in the Tariff Act of 1913.

<sup>43</sup> See Baker, *supra* note 42, at 269.

<sup>44</sup> Tariff Act of 1913, § II(B), 38 Stat. 114, 167 (applicable to individuals); *Id.* § II(G)(b), 38 Stat. 114, 172-73 (applicable to corporations).

<sup>45</sup> Baker, *supra* note 42, at 269 (referencing H.R. REP. NO. 86, 63d Cong. 1st Sess. 25 (1913)).

the value mined could have resulted in a total deduction of an amount less than the actual cost of the property in some circumstances.<sup>46</sup>

In considering the Revenue Act of 1916,<sup>47</sup> two observations about Congress are worthy of discussion. First, congressional understanding of the depletion allowance became more sophisticated and detailed as reflected within the wording of tax law. The statutes included references indicating which method producers should use in determining the depletion deduction.<sup>48</sup> Secondly, by specifically mentioning oil and gas, Congress was for the first time recognizing the emerging importance of those resources. The 1916 Act was also more generous in regard to the total depletion allowed for a particular mineral deposit. For property acquired after March 1, 1913, the total accumulated amount of the deduction could be the property's original cost. For property acquired before that date, the total amount allowed was the fair value on March 1, 1913.<sup>49</sup>

### *B. Discovery Depletion*

The Revenue Act of 1918<sup>50</sup> led to the discovery and development of essential natural resources; this became known as "discovery depletion." World War I had directed attention to the importance of certain strategic materials for national security, especially oil and gas.<sup>51</sup> Congress, using the new depletion provisions as an incentive tool, began to appreciate the fact that a "prospector for mines or oil and gas frequently

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<sup>46</sup> For example, assume a mineral property's cost was \$100,000 and the revenue generated from that property was \$1,000,000. If the depletion deduction was five percent of revenue, the total depletion deduction would be \$50,000 ( $\$1,000,000 \times 5\%$ ); only half of the original cost.

<sup>47</sup> Revenue Act of 1916, Pub. L. No. 64-271, 39 Stat. 756.

<sup>48</sup> *Id.* § 5, 39 Stat. 756, 759 (applicable to individuals); *Id.* § 12, 39 Stat. 756, 768 (applicable to corporations). Generally, those provisions stated that for oil and gas wells, the allowance was to be ascertained by the settled production or regular flow method, not the flush flow method. For mines, the allowance was just based on a reasonable amount not to exceed the market value of the year's production.

<sup>49</sup> Revenue Act of 1916, §§ 5(a), 12(a), 39 Stat. 756, 759, 768.

<sup>50</sup> Revenue Act of 1918, Pub. L. No. 65-253, 40 Stat. 1057.

<sup>51</sup> See Austin, *Percentage Depletion: Its Background and Legislative History*, 21 U. KAN. CITY L. REV. 22, 25 (1952).

expends many years and much money in fruitless search.”<sup>52</sup> To entice potential developers to brave the risks of exploration, the depletion allowance offered was based on the fair market value of the resource on the date of its discovery, and thus not limited to just the cost incurred.<sup>53</sup> This so called “discovery clause” created a new, more substantial allowance that could be claimed only by persons involved in finding mineral deposits not previously discovered.<sup>54</sup> New exploration was encouraged for the well-being and security of the country.

The discovery clause was vague.<sup>55</sup> Because it was vague, it discriminated to a large extent against the producers of minerals such as coal, clay, limestone, and to a lesser extent, against the prospectors of metallic ore deposits.<sup>56</sup> The difficulty involved with coal was that practically all of the coal beds were already located and mapped by geological surveys, and therefore, under the post World War I tax provisions, could not be “discovered” because they were already a “proven tract.”<sup>57</sup> In fact, it was noted that “[d]uring the period covered

<sup>52</sup> Revenue Bill of 1918, S. REP. No. 617, 65th Cong., 3d Sess. 6, *reprinted in* 1939-1 C.B. (pt. 2) 117, 120.

<sup>53</sup> *See infra* notes 56-59 and accompanying text.

<sup>54</sup> *See* Revenue Act of 1918, Pub. L. No. 65-253, § 214(a)(10), 40 Stat. 1057, 1067-68. Section 214(a)(10) provides:

In the case of mines, oil and gas wells, other natural deposits, and timber, a reasonable allowance for depletion and for depreciation of improvements, according to the peculiar conditions in each case, based upon cost including cost of development not otherwise deducted: *Provided*, That in the case of such properties acquired prior to March 1, 1913 the fair market value of the property (or the taxpayer's interest therein) on that date shall be taken in lieu of the cost up to that date: *Provided further*, That in the case of mines, oil and gas wells, discovered by the taxpayer, on or after March 1, 1913, and not acquired as the result of purchase of a proven tract or lease, where the fair market value of the property is materially disproportionate to the cost, the depletion allowance shall be based upon the fair market value of the property at the date of the discovery, or within thirty days thereafter. . . . In the case of leases the deductions allowed by this paragraph shall be equitably apportioned between the lessor and lessee. . . .

*Id.* (emphasis added). Similar wording can be found for corporations, see *Id.* at § 234(a)(9), 40 Stat. 1057, 1078-79.

<sup>55</sup> The discovery clause was vague as to what constitutes a “discovery.” For a more detailed discussion, see Fay *The Discovery Clause in Income Tax Laws, Its Inequities and Abuses*, 117 *ENGINEERING & MINING JOURNAL-PRESS* 243 (1924).

<sup>56</sup> *See id.*

<sup>57</sup> *Id.* at 243.

by the [discovery depletion] income tax laws, the Treasury Department did not allow a single coal 'discovery' valuation."<sup>58</sup> Most of the other non-metallic minerals faced similar difficulties. The metallic minerals fared somewhat better.<sup>59</sup>

During the eight-year existence of the discovery depletion allowance, two changes were introduced which limited the amount of the deduction a taxpayer could claim for a single year.<sup>60</sup> Due to the concern that taxpayers could, under the existing law, offset other non-mining income by the depletion deduction, Congress, in the Revenue Act of 1921, limited the deduction to the net income derived from the natural resource property.<sup>61</sup> Three years later, Congress felt that the first limitation was still not sufficient, and that fifty percent of operating profit would represent a fair limitation.<sup>62</sup> That restriction

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<sup>58</sup> *Id.*

<sup>59</sup> One of the main inequalities in the discovery clause related to the "same discovery" issue that benefited only oil and gas prospectors. For example, if a discovery of an iron-ore deposit was made on one person's property and the geological surveys demonstrated that all of the surrounding areas (owned by others) contained an extension of the same deposit, only one "discovery" value was permitted for the original discovery. The other properties could not then be developed and have a deduction based on discovery depletion. However, this was not the case for oil and gas pools. After a pool was discovered, a neighbor could also immediately drill a well (if for no other reason than to protect his own interest in the pool) and claim the discovery depletion allowance even if it was an extension of the original pool. "By a judicious handling of the various wells brought in, it is possible to blanket any pool or oil deposit with 'discovery' valuations, to the extent that 90 per cent of a pool covering many square miles may be reported as 'discovery' area for depletion deductions." *Id.* at 244. The regulations made this possible by stipulating that a discovery well "proved" an area of 160 acres in the form of a square, the center being the site of the well. Apparently, in some cases there was overlapping within the same 160 acres which was technically allowable under the wording of the law. Therefore, the frustration felt by the natural resource developers other than oil and gas can be understood. The tax laws were supposed to encourage exploration and development of all natural resources, but the interpretations were benefiting to a large extent only developers of oil and gas. To make matters even more unfair, the fortunate neighbor who saw a successful oil discovery on adjacent property could set up operations and claim discovery depletion essentially free of the risks that the discovery clause intended to reward. *See generally id.* at 234-44. *But cf. Tax Division Defends Discovery Depletion*, 11 MINING CONGRESS J. 597 (1925).

<sup>60</sup> *See infra* notes 61-63 and accompanying text.

<sup>61</sup> Revenue Act of 1921, Pub. L. No. 76-98, § 214(a)(10), 42 Stat. 227, 241 (applicable to individuals); *Id.* § 234(a)(9), 42 Stat. 227, 256 (applicable to corporations).

<sup>62</sup> STAFF OF SENATE COMM. ON FINANCE, 68TH CONG., 1ST SESS., CHANGES MADE

became law with the passage of the Revenue Act of 1924.<sup>63</sup>

### C. Percentage Depletion

Discovery valuation proved cumbersome to administer for oil and gas wells because a separate valuation had to be made for each well,<sup>64</sup> and those valuations were costly and difficult to prove.<sup>65</sup> Congress once again reconsidered the existing depletion statutes and introduced changes which accomplished two important goals. First, the changes simplified compliance with and administration of the law,<sup>66</sup> and second, they curbed some of the oil and gas developers' abuses of the law that other natural resource developers thought were unfair.<sup>67</sup> The percentage depletion provisions of the Revenue Act of 1926<sup>68</sup> achieved those goals.

The 1926 Act initiated the basic structure of the percentage depletion deduction for oil and gas, and the current tax law has retained this basic structure.<sup>69</sup> As a replacement for discovery depletion, percentage depletion continued to carry the possibility of allowing a deduction for more than original cost, and thus maintained an incentive for exploring and developing new oil and gas wells.

The original percentage amount allowed for depletion was twenty-seven and one-half percent of the production income,<sup>70</sup> limited by the same fifty percent ceiling provided for under

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IN THE REVENUE ACT OF 1921 BY H.R. 6715 AND THE REASONS THEREFORE, (Comm. Print 1924); see also Revenue Bill of 1924, H.R. REP. NO. 179, 68th Cong., 1st Sess. (1924), reprinted in 1939-1 C.B. (pt. 2) 241, 254.

<sup>63</sup> Revenue Act of 1924, Pub. L. No. 68-176, § 204(c), 43 Stat. 253, 260.

<sup>64</sup> Revenue Bill of 1926, H.R. REP. NO. 356, 69th Cong., 1st Sess. 31 (1926), reprinted in 1939-1 C.B. (pt. 2) 361, 362.

<sup>65</sup> Austin, *supra* note 51, at 26-27.

<sup>66</sup> Revenue Bill of 1926, *supra* note 64.

<sup>67</sup> See *supra* note 59 and accompanying text.

<sup>68</sup> Revenue Act of 1926, Pub. L. No. 69-20, 44 Stat. 9.

<sup>69</sup> The Revenue Act of 1926 included the following provision:

In the case of oil and gas wells the allowance for depletion shall be 27 1/2 per centum of the gross income from the property during the taxable year. Such allowance shall not exceed 50 per centum of the net income of the taxpayer (computed without allowance for depletion) from the property, except that in no case shall the depletion allowance be less than it would if computed without reference to this paragraph.

*Id.* at § 204(c)(2), 44 Stat. 9, 16.

<sup>70</sup> *Id.*

the 1924 Act.<sup>71</sup> The twenty-seven and one-half figure was actually a compromise between the House of Representatives and the Senate, derived from a congressionally supervised study on discovery value amounts.<sup>72</sup> The House committee recommended an allowance of twenty-five percent while the Senate recommended thirty percent.<sup>73</sup> The final result was a straight average between the two. Initially, this percentage depletion allowance pertained only to oil and gas resources, however, the Revenue Act of 1932 extended the allowance to coal, metal mines, and sulfur.<sup>74</sup>

Several depletion tax cases were decided by the Supreme Court during the 1910's and 1920's. Each covered a specific topic which reflected both the taxpayers' and the government's uncertainty in dealing with a new tax system.<sup>75</sup> For example, one case involved the issue of whether a lessee of hard minerals was entitled to a depletion deduction.<sup>76</sup> At the time the case was decided, the general understanding was that only a hard mineral fee owner was entitled to depletion, even though it had been an accepted fact that an oil and gas lessee could claim the deduction.<sup>77</sup> This distinction was premised on the assumption that hard mineral interests were different from oil and gas interests.

In 1925, the Court recognized for the first time that an interest acquired by a lessee to exclusively remove the resource, thereby reducing it to ownership, represented depletable

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<sup>71</sup> Cf. Revenue Act of 1924, § 204(c), 43 Stat. 253, 260.

<sup>72</sup> See Baker, *supra* note 42, at 271; see also Austin, *supra* note 51, at 27.

<sup>73</sup> See Revenue Bill of 1926, H.R. REP. No. 356, 69th Cong., 1st Sess. pt. 1 at 31 (1926), reprinted in 1939-1 C.B. (pt. 2) 361, 362-63; Internal Revenue Bill of 1926, S. REP. No. 52, 69th Cong., 1st Sess. 18 (1926), reprinted in 1939-1 C.B. (pt. 2) 332, 345-46.

<sup>74</sup> Revenue Act of 1932, § 114(b)(4), 47 Stat. 169, 203. Section 114(b)(4) stated that the rates for depletion were: coal, 5%; metal mines, 15%; and, sulfur, 23%. *Id.*

<sup>75</sup> See Mahin, *Legal Problems in Connection With Percentage Depletion*, 21 U. KAN. CITY L. REV. 31 (1952) (providing a discussion of Stratton's Independence v. Howbert, 231 U.S. 399 (1913)); Von Baumbach v. Sargent Land Co., 242 U.S. 503 (1917); U.S. v. Ludey, 274 U.S. 295 (1927); Stanton v. Baltic Mining Co., 240 U.S. 103 (1916); Lynch v. Alworth-Stephens Co., 267 U.S. 364 (1925); Murphy Oil Co. v. Burnet, 287 U.S. 299 (1932); Burnet v. Thompson Oil & Gas Co., 283 U.S. 301 (1931).

<sup>76</sup> Lynch v. Alworth-Stephens Co., 267 U.S. 364, 368 (1925).

<sup>77</sup> See Baker, *supra* note 42, at 278.

“property.”<sup>78</sup> The Court noted that the term “property” as used in the statutes did not appear to be limited to a legal title ownership.<sup>79</sup> A depletion interest, the value of which decreases as the mineral is removed, was the salient issue addressed by the Court.<sup>80</sup> Previous opinions were limited to discussions of fee interests.

### III. ESTABLISHMENT OF THE ECONOMIC INTEREST CONCEPT

The equitable apportionment of the depletion allowance between a lessor and a lessee had been supported by the Supreme Court<sup>81</sup> and included in the Revenue Act of 1918.<sup>82</sup> Subsequently, the issue became how the depletion allowance would be apportioned between sublessors and sublessees, because the Internal Revenue Service (Service) had disapproved of the depletion deduction to a sublessor who retained an overriding royalty interest.<sup>83</sup> This ruling demonstrated that the statutes, at that time, had not specifically addressed the question of depletion in every conceivable type of transaction. Thus, guidance was necessary to establish the requisite conditions for the depletion deduction apportionment.

#### A. *Palmer v. Bender*<sup>84</sup>

In 1933, the Supreme Court introduced the concept of economic interest which had the effect of broadening the availability of the depletion deduction. The Court, in *Palmer v. Bender*,<sup>85</sup> stated:

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<sup>78</sup> *Lynch v. Alworth-Stephens Co.*, 267 U.S. 364, 369-71 (1925). *Lynch* arose under the Revenue Act of 1916 which made no provision for apportioning the depletion deduction between the lessor and lessee. *Id.*

<sup>79</sup> *Id.*

<sup>80</sup> G.C.M. 2270, 6-2 C.B. 216, 217-218 (1927).

<sup>81</sup> *See Lynch*, 267 U.S. 364.

<sup>82</sup> Revenue Act of 1918, Pub. L. No. 65-253, 40 Stat. 1057.

<sup>83</sup> G.C.M. 8650, 9-2 C.B. 214, 221 (1930), *repealed by* G.C.M. 11,822, 12-1 C.B. 229 (1933).

<sup>84</sup> 287 U.S. 551 (1933).

<sup>85</sup> *Id.*

[t]he language of the statute is broad enough to provide, at least, for every case in which the taxpayer has acquired, by investment, any interest in the oil in place, and secures, by any form of legal relationship, income derived from the extraction of the oil, to which he must look for a return of his capital.<sup>86</sup>

Thus, if there is a natural resource investment which by its nature can only be recovered through extraction and sale, depletion should be allowed. The investment, or "value," is depleted as the resource is removed. Even though technical ownership of the mineral might not be acquired before severance, a valuable, legal interest may be obtained.<sup>87</sup>

In *Palmer*, the taxpayer was a member of two partnerships which acquired unproven oil and gas leases. Subsequent drilling led to the discovery of oil, and the properties were then transferred to other parties in exchange for both immediate cash bonuses and future payments out of the oil production revenues.<sup>88</sup> Taking the position that the transfer was a sublease, the taxpayer deducted depletion based on the discovery value from his bonus and royalty shares.<sup>89</sup> The government's position was based on the theory that a sale of the mineral interest had occurred, and therefore the depletion allowance, which was much higher than the cost of the leases, should not be permitted.<sup>90</sup> The Court decided in favor of the taxpayer, and *Palmer* was considered to be a sublessor who had neither held a fee ownership in the land nor performed the extraction operation.<sup>91</sup> Although the taxpayer's only activity was receiving royalties from the operators and paying royalties to the land owners, this did not prevent him, as a sublessor, from possessing a depletable interest. As more oil was extracted, the value of the interest decreased. "Economic interest" was there-

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<sup>86</sup> *Id.* at 557. This quote has generally been incorporated into the Treasury regulations. See *supra* note 12 and accompanying text.

<sup>87</sup> *Palmer*, 287 U.S. at 558.

<sup>88</sup> *Id.* at 553.

<sup>89</sup> *Id.* at 555. *Palmer* arose under the discovery depletion provisions of the Revenue Act of 1921.

<sup>90</sup> *Id.* at 553-54.

<sup>91</sup> *Id.* at 558-59.



fore established as a very broad concept which contained the feature of encouraging taxpayers to explore and develop natural resource property.<sup>92</sup>

*B. Thomas v. Perkins*<sup>93</sup>

With the issue of a lessee's entitlement to depletion having been settled earlier in *Lynch v. Alworth-Stephens Co.*,<sup>94</sup> a new aspect arose concerning a lessee's reportable gross income. The taxpayer in *Thomas v. Perkins*<sup>95</sup> was an assignee who paid a sum of money to the assignors out of the oil produced. The main question before the Court was whether the amounts paid to the assignors should be included in the taxpayer's gross income (subject to depletion).<sup>96</sup> The Court found that the income at issue belonged to the assignors due to their retention of an economic interest, and therefore should not be included in the assignee's gross income.<sup>97</sup>

*Thomas* resolved the reverse side of the issue addressed in *Palmer v. Bender*.<sup>98</sup> The taxpayer in *Palmer* was in effect an assignor retaining an oil payment in addition to a cash bonus and a royalty interest. Since that assignor was found to possess an economic interest, depletion was allowed against the taxable income.<sup>99</sup> In *Thomas*, the Court reasoned that if such income was considered depletable gross income to an assignor, then such income, for depletion purposes, should not be linked to the assignee.<sup>100</sup>

*C. Helvering v. Bankline Oil Co.*<sup>101</sup>

*Palmer v. Bender*<sup>102</sup> established the two main factors used to determine economic interest; however, many questions sur-

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<sup>92</sup> *Id.* The encouragement stems from the fact that income tax liability may be reduced significantly when a deduction is allowed which is greater than the original cost.

<sup>93</sup> 301 U.S. 655 (1937).

<sup>94</sup> 267 U.S. 364 (1925).

<sup>95</sup> 301 U.S. 655 (1937).

<sup>96</sup> *Id.* at 658.

<sup>97</sup> *Id.* at 663.

<sup>98</sup> 287 U.S. 551 (1933).

<sup>99</sup> *Id.* at 558.

<sup>100</sup> *Thomas*, 301 U.S. at 663.

<sup>101</sup> 303 U.S. 362 (1938).

<sup>102</sup> 287 U.S. 551 (1933).

rounding these factors began to arise. Considering the first factor, what exactly did the Court mean by an "investment"? Since the investment does not have to result in actual ownership in the mineral before extraction, the possibility existed that any related interest of the producing property could be considered an investment. However, in *Helvering v. Bankline Oil Co.*,<sup>103</sup> the Court did not construe the investment factor to have such a liberal application. The Court stated:

[t]he phrase 'economic interest' is not to be taken as embracing a mere economic advantage derived from production, through a contractual relation to the owner, by one who has no capital investment in the mineral deposit.<sup>104</sup>

In *Bankline Oil*, the taxpayer was a processor of natural gas but was not involved in the actual well production.<sup>105</sup> The taxpayer did, however, install and maintain pipelines directly connected to the wells through which the producers agreed to deliver wet gas produced at the well.<sup>106</sup> The taxpayer processed the wet gas by separating the gasoline from the dry gas.<sup>107</sup> Upon sale of the gasoline, the taxpayer remitted thirty-three and one-third percent of the gross proceeds to the well producers.<sup>108</sup> The income involved here came solely from, and was dependent on, the natural resource.<sup>109</sup> If production declined, the taxpayer's income also declined.

The taxpayer made an investment in equipment related directly to the well and looked solely to the well's production for income. The Court, however, found that the requisite investment "in the mineral in place" was not met.<sup>110</sup> The taxpayer's investment was in equipment, not the mineral.<sup>111</sup> There was no control over the mineral before or during the extraction process.<sup>112</sup> The gas was received for processing only

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<sup>103</sup> 303 U.S. 362 (1938).

<sup>104</sup> *Bankline Oil*, 303 U.S. at 367.

<sup>105</sup> *Id.*

<sup>106</sup> *Id.* at 365.

<sup>107</sup> *Id.*

<sup>108</sup> *Id.*

<sup>109</sup> *Id.* at 368.

<sup>110</sup> *Bankline Oil*, 303 U.S. at 368.

<sup>111</sup> *Id.*

<sup>112</sup> *Id.*

after production.<sup>113</sup> Thus, an economic advantage was obtained through the contractual relationship, but such a relationship was not sufficient to establish an economic interest because there was no in-place mineral interest prior to extraction.<sup>114</sup>

*D. Helvering v. Elbe Oil Land Development Co.*<sup>115</sup>

The Court's first direct decision on a net profits interest issue resulted in a very confusing outcome. In *Helvering v. Elbe Oil Land Development Co.*,<sup>116</sup> the taxpayer transferred oil and gas properties in exchange for an immediate lump sum cash payment, other stated payments for four years, and an additional payment equal to one-third of the profits after the transferee was reimbursed for all operating expenditures.<sup>117</sup> The transferor seemed to have retained a net profits interest coupled with advanced royalties, giving him a retained economic interest.<sup>118</sup> The Court, however, stated that the additional payments received out of the net profits were proceeds of a "personal covenant" of the transferee, causing a sale rather than a lease by the taxpayer.<sup>119</sup> The correctness and continued validity of the *Elbe Oil* case has been questioned.<sup>120</sup>

*E. Anderson v. Helvering*<sup>121</sup>

*Anderson v. Helvering*<sup>122</sup> demonstrates the importance of the requirement that income come only from extraction and production. Income from extraction and production comprises the second factor in the economic interest definition. In *Anderson*, the vendee acquired certain royalty interests, fee inter-

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<sup>113</sup> *Id.*

<sup>114</sup> *Id.*

<sup>115</sup> 303 U.S. 372 (1938).

<sup>116</sup> *Id.*

<sup>117</sup> *Id.* at 374.

<sup>118</sup> *Id.* at 376.

<sup>119</sup> *Id.* at 375.

<sup>120</sup> See Baker, *supra* note 42. Baker states: "to the extent that the Court regarded the assignee's net profits agreement in the *Elbe* cases to be simply a personal covenant rather than an economic interest in the oil in place retained by the assignor, the case is wrong and no longer good law." *Id.* at 292.

<sup>121</sup> 310 U.S. 404 (1940).

<sup>122</sup> *Id.*

ests, and deferred oil payments.<sup>123</sup> Consideration received included specific cash payments payable to the vendor out of one-half of the gas production.<sup>124</sup> The consideration could have been payable out of proceeds from the sale of the fee title of the property if actually sold. This alternative method of remunerating the vendor established a potential source of income other than production, leading the Court to find that the vendor did not receive depletable income.<sup>125</sup> The case, therefore, turned on the reservation of the additional type of security and meant that the income could not be considered as derived "solely" from production.<sup>126</sup> The vendee was then required to include the payments made to the vendor in gross income. Apparently, the Court felt that no other potential source of income should be available because the risk of production, which percentage depletion was to reward, would then be minimized.<sup>127</sup>

#### *F. General Council Memorandum 22730*

The Service took the opportunity to present an historical outline of the economic interest concept. In General Council Memorandum 22730,<sup>128</sup> the Service discussed the major economic interest cases to date, along with the Supreme Court's reasoning behind the decisions and how they were used to develop the tax application of depletion allowances. In the memorandum, the Service recognized that in *Palmer v. Bender*<sup>129</sup> the Court refused to distinguish between sublessors and assignors of interests who retain an interest in the mineral production.<sup>130</sup> As long as the interest was tied to the mineral in place and the return was not guaranteed until production, the risk was still shared. In addressing advance bonus payments, General Council Memorandum 22730 stated that if future pay-

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<sup>123</sup> *Id.* at 404.

<sup>124</sup> *Id.* at 405.

<sup>125</sup> *Id.* at 412.

<sup>126</sup> *Id.*

<sup>127</sup> *Anderson*, 310 U.S. at 413.

<sup>128</sup> G.C.M. 22,730, 1941-1 C.B. 214.

<sup>129</sup> 287 U.S. 551 (1933).

<sup>130</sup> G.C.M. 22,730, 1941-1 C.B. 214, 215.

ments out of mineral proceeds were present, the bonus was nothing more than an advance royalty and not a capital asset sale.<sup>131</sup> Depletion, therefore, was allowable.<sup>132</sup>

*G. Kirby Petroleum Co. v. Commissioner*<sup>133</sup>

In *Kirby Petroleum Co. v. Commissioner*,<sup>134</sup> the Court found an economic interest present in a share of the net profits realized from production which was accompanied by royalty payments.<sup>135</sup> The taxpayer owned a fee simple title to land and leased it to developers.<sup>136</sup> The Service recognized the right of depletion as applicable to bonuses and royalties based on gross proceeds but denied depletion on revenue from a net profits sharing agreement.<sup>137</sup> This position was based on the reasoning that a net profits interest is not the same as an in-place mineral investment interest.<sup>138</sup> The Court concluded that a net profits interest and a royalty based on gross proceeds were one in the same, and depletion could be taken.<sup>139</sup>

*H. Burton-Sutton Oil Co. v. Commissioner*<sup>140</sup>

The next related concept addressed by the Court concerned a net profits interest without an accompanying royalty interest. The taxpayer in *Burton-Sutton Oil Co. v. Commissioner*<sup>141</sup> acquired a lease for consideration of only a fifty percent net profits interest from operations.<sup>142</sup> Notwithstanding the outcome of *Helvering v. Elbe Oil Development Co.*,<sup>143</sup> the Court ruled that an economic interest was retained by the grantor

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<sup>131</sup> *Id.* at 217.

<sup>132</sup> *Id.*

<sup>133</sup> 326 U.S. 599 (1946).

<sup>134</sup> *Id.*

<sup>135</sup> *Id.* at 607.

<sup>136</sup> *Id.* at 601.

<sup>137</sup> *Id.* at 602.

<sup>138</sup> *Id.* at 606.

<sup>139</sup> *Kirby Petroleum*, 326 U.S. at 607.

<sup>140</sup> 328 U.S. 25 (1946).

<sup>141</sup> *Id.*

<sup>142</sup> *Id.* at 26.

<sup>143</sup> 303 U.S. 372 (1938).

and payments made under the agreement were not to be included in the grantee taxpayer's income.<sup>144</sup> The fine line drawn between *Burton-Sutton* and *Elbe Oil* was due to the grantors' retained control over the operations.<sup>145</sup>

Since the term "economic interest" was introduced and defined by the Supreme Court in *Palmer v. Bender*,<sup>146</sup> the only guidance regarding economic interest being given in this area was from the judicial system. Unfortunately, the guidance always resulted from a conflict between a taxpayer and the Service, a conflict which might otherwise have been avoided with a more comprehensive tax. With the decision in *Burton-Sutton*, the income factor in the economic interest definition was made more certain and, generally, more favorable to the taxpayer. The issues of gross income, bonuses, royalties, and net profits interest were settled by the Supreme Court.

The main issues then turned to the definition's other factor: investment. Although the Court had already addressed the investment issue,<sup>147</sup> the following cases demonstrate the continued uncertainty surrounding the economic interest concept. These cases demonstrate the Court's emphasis that both sides of the definition are required to establish an economic interest, and that *Palmer* has remained applicable in the various natural resource arrangements.

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<sup>144</sup> *Burton-Sutton*, 328 U.S. at 36.

<sup>145</sup> *See id.* at 38. Justice Frankfurter wrote:

[n]othing better illustrates the gossamer lines that have been drawn by this Court in tax cases than the distinction made in the Court's opinion between *Helvering v. Elbe Oil Land Co.*, 303 U.S. 372, and this case. To draw such distinctions, which hardly can be held in the mind longer than it takes to state them, does not achieve the attainable certainty that is such a desideratum in tax matters, nor does it make generally for respect of law. Perhaps it is inherent in the scheme which Congress has provided for review of tax litigation that we have such an unsatisfactory series of decisions as those which are sought to be reconciled by the present opinion. If so, then the call for legislation voiced in responsible quarters to reform the situation may well be heeded.

*Id.* (Frankfurter, J., concurring).

<sup>146</sup> 287 U.S. 551, 557 (1933).

<sup>147</sup> *See Helvering v. Bankline Oil Co.*, 303 U.S. 362 (1938).

I. *Commissioner v. Southwest Exploration Co.*<sup>148</sup>

In a unique case, the investment factor seemingly became more liberal. In *Commissioner v. Southwest Exploration Co.*,<sup>149</sup> economic interest was found to be present even though there was neither investment in the land containing the mineral nor ownership of a leasehold granting any mineral interest.<sup>150</sup>

Under California law at the time of the case, certain offshore oil could only be extracted by slant drilling from adjacent upland sites.<sup>151</sup> Southwest agreed to pay the upland owners twenty-four and one-half percent of the net profits for the use of their land as drilling sites.<sup>152</sup> The upland owners did not make a cash investment in, nor have any right to drill for, offshore oil, both of which were possessed by Southwest upon acquisition of the lease through the bidding process.<sup>153</sup> The upland owners were not involved in the drilling operations and therefore were not subject to any of the risk. In fact, their only contribution was to allow the use of their land for the whipstock drilling.<sup>154</sup>

The Supreme Court allowed the owners percentage depletion based on royalties paid to them by Southwest, the oil developer. The Court found that under the circumstances, the upland owners possessed the requisite economic interest.<sup>155</sup> In applying the definition's factors, the Court recognized that for the first time it was considering a case in which a fee owner of adjoining lands was claiming a depletion allowance.<sup>156</sup> In prior cases, the taxpayer at some point in time had at least a fee or leasehold interest in the producing property.<sup>157</sup> Nevertheless, absence of ownership, plus absence of the right to drill, did not constitute lack of investment for economic inter-

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<sup>148</sup> 350 U.S. 308 (1956).

<sup>149</sup> *Id.*

<sup>150</sup> *Id.* at 316.

<sup>151</sup> *Id.* at 310.

<sup>152</sup> *Id.*

<sup>153</sup> *Id.*

<sup>154</sup> *Southwest Exploration*, 350 U.S. at 310.

<sup>155</sup> *Id.* at 317.

<sup>156</sup> *Id.* at 315.

<sup>157</sup> *Id.* at 314-15.

est purposes. The Court reasoned that "the tax law deals in economic realities, not legal abstractions, and upon closer analysis it becomes clear that these factors do not preclude an economic interest in the upland owners."<sup>158</sup> Since the state required drilling from shore, the upland owners were placed in a "controlling" position.<sup>159</sup> The contribution of the use of their land in exchange for a percentage of net profits "was an investment in the oil in place sufficient to establish their economic interest."<sup>160</sup> The Court's rationale in *Southwest Exploration* has been applied to surface owners receiving royalties for the use of their land overlying severed mineral estates.<sup>161</sup>

*J. Parsons v. Smith*<sup>162</sup>

Another landmark decision concerning economic interest was given by the Court in *Parsons v. Smith*.<sup>163</sup> This case involved a contract miner under an oral agreement to strip mine coal and deliver it to the landowner in exchange for a per-ton fee.<sup>164</sup> The contract was not written because the taxpayer did not wish to be bound to removing coal for a very long period.<sup>165</sup> The taxpayer's main business activity was road

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<sup>158</sup> *Id.* at 315.

<sup>159</sup> *Id.* at 310 and 316.

<sup>160</sup> *Southwest Exploration*, 350 U.S. at 316.

<sup>161</sup> See *Newton v. United States*, 584 F. Supp. 116 (N.D. Ala. 1984). In *Newton*, the taxpayer owned surface rights and attempted to treat income from royalties as § 631(c) income, thus taxed as a capital gain. *Id.* at 117. The court, however, found that the taxpayer did not possess an economic interest prior to entering the lease which provided royalties for the use of the surface. *Id.* at 117-18. The court made reference to, but did not rule on, the fact that the Commissioner allowed percentage depletion on the royalty income and, therefore, economic interest was acquired when the taxpayer entered into the lease agreement. *Id.* at 118. The important distinction in *Newton* is that a surface owner may not possess an economic interest until a royalty agreement is contracted, and thus an economic interest is not retained to meet the provisions of § 631(c) to afford capital gains treatment. With the capital gain changes introduced in the Tax Reform Act of 1986, however, § 631(c) may not be beneficial to taxpayers in the future. New § 631(c) does allow percentage depletion for any § 631(c) income which is taxed at ordinary rates. See I.R.C. § 631(c) (West Supp. 1987). See also *Omer v. United States*, 329 F.2d 393 (6th Cir. 1964). In *Omer*, the facts were similar as those in *Newton*, and the court reached the same outcome for the taxpayer.

<sup>162</sup> 359 U.S. 215 (1959).

<sup>163</sup> *Id.*

<sup>164</sup> *Id.* at 217.

<sup>165</sup> *Id.* at 216.



building, which was slack at that time.<sup>166</sup> The taxpayer wished to discontinue contract mining when road building contracts became viable again.<sup>167</sup> The agreed upon reimbursement per ton was raised from time to time to help the contract miner offset higher wage and material costs. None of the coal could be delivered or sold to any other party except the landowner.<sup>168</sup> An additional point which proved to be a very important issue subsequent to this case was that the contract was voidable on a very short (ten-day) notice.<sup>169</sup>

The taxpayer took the position that because of his contracts to mine the coal, and the contribution of equipment, organization, and skill needed to mine the coal, he had made a capital investment in, and thus acquired an economic interest in, the mineral in place.<sup>170</sup> The Court, taking a different view, listed seven factors which denied economic interest:

(1) The investments were in equipment, all of which was movable—not in the coal in place; (2) The investments in equipment were recoverable through depreciation—not depletion; (3) The contracts were completely terminable on short notice; (4) The landowners did not agree to surrender and did not actually surrender to petitioners any capital interest in the coal in place; (5) The coal at all times, even after it was mined, belonged entirely to the landowners, and petitioners could not sell or keep any of it, but were required to deliver all that they mined to the landowners; (6) The petitioners were not to have any part of the proceeds of the sale of the coal, but were to be paid a fixed sum for each ton mined and delivered; (7) The petitioners agreed to look only to the landowners for all sums to become due them under the contracts.<sup>171</sup>

Even though it provided a set of factors to be used to evaluate the possession of economic interest, the Court missed a crucial opportunity to weigh each factor's importance for

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<sup>166</sup> *Id.*

<sup>167</sup> *Id.*

<sup>168</sup> *Parsons*, 359 U.S. at 217.

<sup>169</sup> *Id.* The short-notice terminability issue led to the decision in *United States v. Swank*, 451 U.S. 571 (1981). See *infra* notes 176-80 and accompanying text.

<sup>170</sup> *Parsons*, 359 U.S. at 223-24.

<sup>171</sup> *Id.* at 225.

contract miners. Questions remained as to whether any of the factors outweigh the others, or if a majority, i.e., four out of seven, being present, dictates economic interest.

*K. Paragon Jewel Coal Co. v. Commissioner*<sup>172</sup>

The Court passed up a second opportunity to indicate what importance or weight to assign to the *Parsons* factors in *Paragon Jewel Coal Co. v. Commissioner*.<sup>173</sup> The Court denied contract miners percentage depletion because, in its reasoning, the same seven factors of *Parsons* were present.<sup>174</sup> Even though the miners here were involved in deep underground mines and had to cut shafts, build a railroad spur, open ventilation tunnels, etc., the short-notice terminability factor helped cause the necessary "investment" not to be found. It seemed as though the Court was saying that at a minimum the right to mine to exhaustion must be present, or economic interest is not present. This position was adopted by the Service and incorporated into several Revenue Rulings.<sup>175</sup>

*L. United States v. Swank*<sup>176</sup>

One of the most recent Supreme Court cases to directly address the economic interest issue demonstrates that the Court did not actually intend to attach such importance to short-notice terminability as the Service and the Tax Court had assumed. In *United States v. Swank*,<sup>177</sup> the terminability factor alone could no longer be used to negate the possession of economic interest.<sup>178</sup> The Court acknowledged that neither the controlling statute nor the regulations make reference to a

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<sup>172</sup> 380 U.S. 624 (1965).

<sup>173</sup> *Id.*

<sup>174</sup> *Id.* at 634-35.

<sup>175</sup> See Rev. Rul. 72-477, 1972-2 C.B. 310; Rev. Rul. 73-32, 1973-1 C.B. 301; Rev. Rul. 74-506, 1974-2 C.B. 178; Rev. Rul. 74-507, 1974-2 C.B. 170; Rev. Rul. 77-341, 1977-2 C.B. 204; Rev. Rul. 77-481, 1977-2 C.B. 205. Rev. Rul. 83-160, 1983-2 C.B. 99 (modified Rev. Ruls 72-477 & 73-32); (revoked Rev. Rul. 74-506, 74-507, 77-341, & 77-481).

<sup>176</sup> 451 U.S. 571 (1981).

<sup>177</sup> *Id.*

<sup>178</sup> *Id.* at 585.

minimum time period.<sup>179</sup> Therefore, that factor by itself would not have caused a different outcome in *Parsons* or *Paragon Jewel Coal Co.* because all of the facts surrounding a particular case must be examined.<sup>180</sup>

The *Swank* decision was considered so important in this area of taxation that its full text was reprinted in the Internal Revenue Service's Cumulative Bulletin,<sup>181</sup> and it also led to the modification and revocation of several prior Revenue Rulings.<sup>182</sup> Even after the decision that terminability is not the determining factor, the application of the economic interest concept within the contract miner issue is still evolving.<sup>183</sup> Two recent Revenue Rulings demonstrate this unsettled aspect.<sup>184</sup>

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<sup>179</sup> *Id.* at 579.

<sup>180</sup> *Id.* at 583-85.

<sup>181</sup> Ct. D. 2006, 1981-1 C.B. 373.

<sup>182</sup> See Rev. Rul. 83-160, 1983-2 C.B. 99 (modifying Rev. Rul. 72-477, 1972-2 C.B. 310 and Rev. Rul. 73-32, 1973-1 C.B. 301); (revoking Rev. Rul. 74-506, 1974-2 C.B. 178, Rev. Rul. 74-507, 1974-2 C.B. 179, Rev. Rul. 77-341, 1977-2 C.B. 204, and Rev. Rul. 77-481, 1977-2 C.B. 205).

<sup>183</sup> For a detailed discussion of the contract miner issue, see McMahon, *Licensees and Economic Interest in Minerals After Swank and Revenue Ruling 83-160*, 72 Ky. L.J. 787 (1984).

<sup>184</sup> In Revenue Ruling 84-88, 1984-1 C.B. 141, the Service held that a taxpayer would possess an economic interest although the contract to mine coal provided that the coal was to be delivered only to the owner of the coal properties. The taxpayer and a property owner entered into an agreement that granted the taxpayer the right to mine the coal until its exhaustion. Under the agreement, all of the coal was to be delivered to the property owner who then sold the coal to others. The taxpayer's reimbursement was based on seventy percent of the sale proceeds, with a stipulated minimum amount per ton to be received. This minimum amount per ton applied only to a certain number of tons and was to be paid only if it was greater than seventy percent of the proceeds on the sales to others, but the minimum amount could not exceed the actual proceeds. The taxpayer's position was that of a contract miner who did not at any time, before or after extraction, have ownership of the coal. Under the factors provided in *Parsons v. Smith*, 359 U.S. 215 (1959), the ownership issue would tend to impair a contract miner's possession of an economic interest. The taxpayer in Revenue Ruling 84-88 acquired rights both to mine the coal to exhaustion and look to its sale for an investment return; thus, an economic interest was present. The taxpayer's income was dependent upon the market price, and hence a sharing of the risks was retained.

The facts of Revenue Ruling 86-81, 1986-1 C.B. 249 involved a lessor of coal properties (owner-lessor) who entered into a contract with a coal operator (operator-lessee) to extract coal for a specified number of years. The operator-lessee was required to follow plans, maps, and projections provided by the owner-lessor's engineers in an attempt not to render unextractable an unnecessarily large portion of the coal. The coal extracted was to be delivered to the owner-lessor in exchange for proceeds at the

*M. Commissioner v. Engle*<sup>185</sup>

The decision of the last Supreme Court case to be discussed was effectively overturned by Congress in the Tax Reform Act of 1986. In *Commissioner v. Engle*,<sup>186</sup> the Court ruled that advanced royalties or bonuses received for oil and gas leases are subject to depletion regardless of whether there was actual production of the mineral or not during the year of receipt.<sup>187</sup> This position had been an accepted interpretation of tax law for at least fifty years.<sup>188</sup> In arguing its cases, however, the Service took the position that the Tax Reduction Act of 1975<sup>189</sup> dictated that percentage depletion should not be allowed if there was no production during the year.<sup>190</sup> The Court found that Congress' original intent behind the provisions had not changed,<sup>191</sup> and it allowed depletion.<sup>192</sup>

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prevailing market rate. If the owner-lessor did not want the coal, then he could sell it to others. Regardless of the disposition of the mineral, the owner-lessor was to receive two royalty amounts—both based on a percentage of proceeds that the operator-lessee received for the coal. One royalty was for the production of the coal, and the other was an engineering royalty. The royalties were compensation for the above plans, maps, and projections. The Service stated that the operator-lessee possessed an economic interest and held that the owner-lessor retained an economic interest in the royalty payments, which were subject to I.R.C. § 631(c). The owner-lessor did not, however, possess an economic interest in the coal purchased from the operator-lessee. Therefore, the depletion was not available from the proceeds upon the sale of the coal.

<sup>185</sup> 464 U.S. 206 (1984).

<sup>186</sup> *Id.*

<sup>187</sup> *Id.* at 227-28.

<sup>188</sup> See *Herring v. Commissioner*, 293 U.S. 322 (1934).

<sup>189</sup> Tax Reduction Act of 1975, Pub. L. No. 94-12, 89 Stat. 26.

<sup>190</sup> *Engle*, 464 U.S. at 215.

<sup>191</sup> See generally White, *Congressional Intent as a Basis for Decision in Commissioner v. Engle*, 11 OHIO N.U.L. REV. 289 (1984).

<sup>192</sup> *Engle*, 464 U.S. at 210. The advanced royalty or bonus was to be connected to production at some point. The *Engle* Court stated:

Even under pre-1975 law, however, depletion deductions eventually had to be attributable to actual production. Lessors receiving bonus or advanced royalty income without oil or gas being produced during the life of the lease have been required to recapture their depletion deductions and restore the previously deducted amounts to income. See *Douglas v. Commissioner*, 322 U.S. 275, 285 (1944). Furthermore, since only one percentage depletion allowance is statutorily authorized for each dollar of oil and gas income, lessees have always been required to reduce their allowances by any bonuses or advanced royalties paid to lessors. See *Helvering v. Twin Bell Oil Syndicate*, 293 U.S. 312 (1934). Thus, prior to 1975, those who held

Congress, in the 1986 Act, apparently reconsidered its position on that matter for oil, gas, and geothermal deposits.<sup>193</sup> For any lease bonus, advance royalty, or other amounts paid without regard to production of the property, percentage depletion is no longer allowable.<sup>194</sup> For future lease arrangements, lessors should require at least a minimum amount of production activity to secure the percentage depletion deduction. However, cost depletion may still be available.<sup>195</sup>

Over the years, the economic interest concept has usually been interpreted quite liberally in favor of the taxpayer. As long as the taxpayer can establish an investment which has a value that declines with extraction, and the only income source is based on production and is somehow contingent, economic interest will be present.

#### IV. POLICY IMPLICATIONS

##### A. Early Policy Developments

The early discovery depletion provisions embodied policy considerations adopted by Congress for national security reasons. As discussed previously, the main purpose of the provisions was to encourage the exploration and development of important natural resources.<sup>196</sup> The discovery provisions, however, were difficult to administer and were replaced by the percentage depletion provisions which have remained basically the same.<sup>197</sup> Percentage depletion carried with it the same incentive for the natural resource industry.<sup>198</sup> Those provisions based the depletion allowance on an amount unrelated to the

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economic interests in mineral deposits, large or small, were entitled to a single percentage depletion deduction for *all* income from the property, including lease bonus and advanced royalty income, so long as oil or gas was eventually extracted from the land.

*Id.*

<sup>193</sup> See Tax Reform Act of 1986, Pub. L. No. 99-514, § 412(a), 100 Stat. 2085.

<sup>194</sup> I.R.C. §§ 613(e)(4), 613A(d)(5) (West Supp. 1987).

<sup>195</sup> See Treas. Reg. § 1.612-3 (as amended in 1977).

<sup>196</sup> See *supra* notes 50-54 and accompanying text.

<sup>197</sup> See *supra* notes 64-69 and accompanying text.

<sup>198</sup> See *supra* note 69 and accompanying text.

property's cost, thereby establishing it as more than just a capital recovery technique.<sup>199</sup>

Economic interest as a concept was introduced as the standard a taxpayer must reach in order to take advantage of the preferential treatment afforded the risk takers. The Congressional policy was followed by the Supreme Court decisions which addressed the issue as it arose in various types of transactions and arrangements.

### *B. Recent Policy in Tax Reform*

Even though the percentage depletion provisions and the economic interest concept were not altered greatly by the Tax Reform Act of 1986, additional insight into governmental natural resource taxation policy is contained in some of the tax reform proposals presented prior to the 1986 Act. Two of those proposals sought to completely eliminate the percentage depletion allowance or, at the very least, severely limit its applicability.

A Treasury Department report<sup>200</sup> released in 1984 recommended repealing the percentage depletion provisions entirely.<sup>201</sup> The main reason given for the proposed change was that the present percentage depletion statutes encourage excessive development of existing properties instead of encouraging exploration for new natural resources.<sup>202</sup> The "excessive devel-

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<sup>199</sup> See McMahon, *Defining the "Economic Interest" in Minerals After United States v. Swank*, 70 Ky. L.J. 23, 28, 84-87 (1981-82).

<sup>200</sup> *Tax Reform For Fairness, Simplicity, and Economic Growth*, The Treasury Department Report to the President, Vol. 2 (General Explanation of the Treasury Department Proposals) (November 1984).

<sup>201</sup> *Id.* at 230.

<sup>202</sup> The reasons given by the Treasury Department for the proposed change were stated as follows:

Since percentage depletion may continue to be claimed after all the taxpayer's costs have been recovered, percentage depletion is best viewed as a production subsidy, rather than as a method of capital recovery. As a production subsidy, however, percentage depletion is inefficient. Because of the relatively lengthy interval between the acquisition of a property and initial production (if, in fact, the property is ever productive) percentage depletion encourages excessive development of existing properties, rather than the exploration new deposits. Moreover, because the allowance is

opment'' term stems from the fact that some operations continue after the cost of the property has been recovered because percentage depletion allows a continuing deduction based on revenue. Allowing the continued deduction, however, parallels the purpose of percentage depletion; it is not a capital recovery provision; rather, it is a development incentive tool. Continued development, therefore, is to be encouraged.

Following the Treasury Department's proposal, the Reagan Administration proposed similar changes with some slight modifications.<sup>203</sup> The Administration's proposal recognized that a total repeal of percentage depletion could possibly have a significant adverse effect on a part of the domestic oil and gas industry.<sup>204</sup> Percentage depletion, under this proposal, would have been retained for the so-called "stripper wells" which produce less than ten barrels a day each but comprise about fifteen percent of the domestic oil production.<sup>205</sup> If these wells were shut down, this country's dependence on foreign energy

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limited to 50 percent of the net income from the property, tax benefits are cut back for developers of marginal properties. Instead, the greatest benefits are provided to the developers of the most prolific or highly concentrated deposits, which would most likely be developed even in the absence of these benefits.

Even if percentage depletion allowances were limited to capital invested, this method would not be an acceptable capital recovery method. Such a method would still provide faster capital recovery for owners of deposits that can be produced more rapidly (even if such production might represent a smaller fraction of total reserves) than for owners of less productive properties. Percentage depletion also would provide faster capital recovery when mineral prices rise, and less rapid recovery when prices fall. Since the discovery of a particularly prolific deposit or a change in product prices may be entirely fortuitous, a capital recovery allowance based on such factors is both capricious and inequitable. Tax simplification would also be enhanced if taxpayers did not have to determine the percentage depletion allowed and the associated tax preference.

Most importantly, cost depletion computed by reference to the taxpayer's adjusted basis in the property, indexed for inflation, is the equivalent of economic depreciation. Use of this method by the extractive industries would place them on a recovery allowance system similar to that employed by other industries.

*Tax Reform For Fairness, Simplicity, and Economic Growth, supra* note 200, at 230.

<sup>203</sup> *The President's Tax Proposals to the Congress for Fairness, Growth, and Simplicity*, [May 1985], *Oil & Gas Taxes Nat. Res.*, (P-H) Bull. 5 (June 5, 1985).

<sup>204</sup> *Id.* at 229.

<sup>205</sup> *Id.*

would increase, thereby adding to the increasing problem of the trade deficit.<sup>206</sup> "Stripper wells" were the only exception provided by the proposed repeal of the percentage depletion after a five-year phase-out period.<sup>207</sup>

The reasons for the proposed changes and the concerns of what their impact might be are very interesting. If the present tax law encourages the so called "excessive development" of existing properties, then the initial purpose for having a depletion deduction greater than cost seems to have been met.<sup>208</sup> If important materials are needed for the well-being of the country, the domestic producing properties should be developed to the fullest extent before moving to a "new" deposit. Operators might abandon the property before total resource recovery. Properties containing abandoned deposits might, in future years, become more valuable if the demand for domestic production increases, thus leading to the resumption of production from those deposits and re-disturbance of reclaimed lands. This means that the overall efficiency of natural resource development would suffer because the deposits could have been fully developed. The percentage depletion provisions continue to promote exploration in addition to full development once a deposit is located.

## V. A QUANTITATIVE ANALYSIS OF ECONOMIC INTEREST

There are several alternative methods available to analyze a specific tax issue, each with its own strengths and limitations. One method is to assess the status of the issue by examining and discussing the statutory guidance and the judicial interpretations' application of the statutes to specific taxpayer situations over time. This is the most common method used in the tax literature, and was applied in this article. An alternative

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<sup>206</sup> *Id.*

<sup>207</sup> *Id.*

<sup>208</sup> Whether the percentage depletion provisions are actually accomplishing the intended results is open to question. See generally Landis, *The Impact of the Income Tax Laws on the Energy Crisis: Oil and Congress Don't Mix*, 64 CALIF. L. REV. 1040, 1062 (1976); Williams, *Some Ingredients of a National Oil and Gas Policy*, 27 STAN. L. REV. 969, 975 (1975); Lichtenberg & Norgaard, *Energy Policy and the Taxation of Oil and Gas*, 14 NAT. RESOURCES J. 501, 514-15 (1974).



method of analysis includes a quantitative assessment of the particular issue by identifying and evaluating the factors or variables associated with the issue's outcome. The following discussion describes a quantitative technique used to analyze the economic interest concept.

### A. Methodology

The use of quantitative techniques is not unknown to the judicial system.<sup>209</sup> The various methods of quantitative analysis have been applied to many different types of cases.<sup>210</sup> Most of those applications have been used as supporting evidence in court proceedings.<sup>211</sup> Other researchers, however, have been successful in identifying variables during their analysis which lead to high prediction probabilities of the cases' outcomes.<sup>212</sup> A similar quantitative assessment is presented here to define the relevant significant variables concerning the economic interest concept.

This analysis involves an examination of all of the Tax Court and Board of Tax Appeals cases during the time period

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<sup>209</sup> For an overview of quantitative analysis, see Barnes, *A Common Sense Approach to Understanding Statistical Evidence*, 21 SAN DIEGO L. REV. 809 (1984).

<sup>210</sup> See generally Fisher, *Multiple Regression in Legal Proceedings*, 80 COLUM. L. REV. 702 (1980); Barnes, *The Significance of Quantitative Evidence in Federal Trade Commission Deceptive Advertising Cases*, 46 LAW & CONTEMP. PROBS. 25 (1983); Rubinfeld and Steiner, *Quantitative Methods in Antitrust Litigation*, 46 LAW & CONTEMP. PROBS. 69 (1983); Finkelstein and Levenbach, *Regression Estimates of Damages in Price-Fixing Cases*, 46 LAW & CONTEMP. PROBS. 145 (1983); Shoben, *The Use of Statistics to Prove Intentional Employment Discrimination*, 46 LAW & CONTEMP. PROBS. 221 (1983).

<sup>211</sup> See *supra* note 210.

<sup>212</sup> See Kort, *Predicting Supreme Court Decisions Mathematically: A Quantitative Analysis of the Right to Counsel Cases*, 51 AM. POL. SCI. REV. 1 (1957). Kort studied the predictability of Supreme Court cases involving the right to counsel issue. A simple regression model was constructed using fourteen cases as the source group, which then was applied to a separate set of fourteen cases comprising the test group (hold-out sample). All cases in the test group were classified correctly, thus leading Kort to the conclusion that important factors can be identified from judicial decisions which appear to have been influential on the judges who were deciding such cases. The information learned in similar types of court decision analyses could be applied to future cases by the parties involved, thus providing additional insight on the probabilities of potential outcomes. See also Nagel, *Political Party Affiliation and Judges' Decisions*, 55 AM. POL. SCI. REV. 843 (1961). Nagel utilized mathematical analysis to determine if judges' political party affiliations appeared to have a relationship to judicial decision-making. The results supported the conclusions that a judge's party membership tends to influence a decision in certain areas of the law.

from 1933 through 1984, in which the possession of an economic interest was the main issue. The initial year for the study was selected, based on the year in which the *Palmer v. Bender*<sup>213</sup> decision introduced the economic interest concept.<sup>214</sup> Out of 259 potentially related Tax Court cases identified, 140 relevant observations were found.<sup>215</sup> These cases are listed in Appendix 4.

As the Tax Court cases were analyzed, three distinct types of economic interest issues were detected which call for separate models. Defining distinct types of cases provides more meaningful information. For example, a taxpayer concerned with obtaining percentage depletion from oil and gas transactions needs information related to that activity, not information for structuring transactions to obtain capital gains treatment when selling hard minerals from owned land. Further, some of the cases involving percentage depletion for hard mineral transactions dealt with contract miner issues which were not present in any of the oil and gas cases. The four groups, including three separate types of cases for which additional separate logit models were developed are:

Model I - All cases reviewed.

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<sup>213</sup> 287 U.S. 551 (1933).

<sup>214</sup> As a first step in identifying the potential cases, the LEXIS retrieval system from Meade Data Central, Inc., Dayton, Ohio, was used. The cases identified were read to identify additional cases and insure that they contained the appropriate main issue. The cases were traced through a citator to identify potential cases and find the final decision of the cases on appeal.

If an unacceptable portion of the cases possessed a final decision at the Court of Appeals or Supreme Court level which had reversed a decision of the Tax Court, the validity of this study's results could be questioned. In all, eleven cases were located which contained such a final disposition. Since this number was relatively small, those cases were removed from the study to avoid any contamination of the data used to identify the significant variables. Thus, only Tax Court cases that were not appealed, or decisions that were appealed but affirmed upon final appeal, were incorporated into this study.

<sup>215</sup> Some of cases used had decisions where the Tax Court judge addressed the economic interest issue more than once. These cases involved taxpayers who were connected with more than just one natural resource transaction arrangement (e.g., more than one lease agreement), and the court ruled on these arrangements separately. Therefore, if the presence of economic interest was decided individually, then each arrangement was treated as a separate observation—giving more observation than cases to this study. The total number of usable Tax Court cases were 126, which contained a total of 140 observations.

Model II - Taxpayers attempting to obtain percentage depletion in oil and gas transactions.

Model III - Taxpayers attempting to obtain percentage depletion in hard mineral transactions.

Model IV - Taxpayers attempting to obtain capital gain status upon natural resource dispositions.

As a final step in this quantitative analysis study, the economic interest cases were grouped according to the decade in which they were decided. The cases contained in a specific decade (i.e., 1930s, 1940s, etc.) were then used to identify the significant variables present during those periods. Comparing the results between decades and finding differences could possibly mean that the factors have changed in importance over time, or that the types of economic interest cases have changed.

The statistical analysis incorporated in this study was a type of log-linear model termed logit analysis, which builds a model around a dependent variable and any number of independent variables. Logit analysis is an accepted methodology which has been used in the social sciences.<sup>216</sup> In this study, the presence or absence of economic interest is the dependent variable, with the independent variables being the factors which intuitively impact the possession of economic interest.<sup>217</sup> The model contained in the results includes only the variables which have a statistically significant effect on the economic interest decision.<sup>218</sup> Therefore, the presence of a variable indicates that

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<sup>216</sup> D. KNOKE & P. BURKE, LOG-LINEAR MODELS 5-7 (1980).

<sup>217</sup> Factors that are considered as the independent variables in this study were selected from several sources. I.R.C. §§ 611(a) (West 1967) and 631(b)&(c) (West Supp. 1987) were the starting point for the selection, but it did not prove helpful because no definition or discussion of economic interest was found. Treas. Reg. § 1.611-1, which contains the definition, did not provide any specific factors, but it did give investment and income as factors of classification. A third type of category was established for factors that did not fall under either investment or income.

The related Supreme Court cases previously discussed furnished the initial factors used as the independent variables. Other sources included the literature in this area and the actual Tax Court cases used in the analysis. In total, twelve variables were identified as being potentially salient with respect to the presence or absence of economic interest. These variables are indicated and discussed in APPENDIX 3.

<sup>218</sup> The finding whether there is presence of economic interest does not necessarily determine whether the decision was favorable to the taxpayer. A cursory review might lead to the conclusion that any taxpayer in a natural resource transaction would definitely

the variable possibly had an impact on the decision rendered by the court. An in-depth discussion of the statistical methods used in the logit analysis technique is presented in Appendix 5.

### *B. Results*

Using logit analysis on all of the Tax Court observations together provides the results shown in Model I in Appendix 1. Having the taxpayer's income tied to the market price (REVMKT) was found to be the most significant variable present among the studied cases. This variable should intuitively be one of the most important because it relates to the second factor of the economic interest definition (income), and demonstrates the necessary contingency which appeared to be so prevalent. The significance of the four other variables is indicated by the order in which they are listed. Therefore, being the actual miner (ACTMIN) and being a fee owner of the land (OWNER) were the next most important variables.

The results for cases involving only percentage depletion for oil and gas are shown in Model II. Only two variables were found to be significant. Having the revenue tied to the market price (REVMKT) was again the most important variable. Examination of the hard mineral percentage depletion case results in Model III demonstrates that a new variable relating to the term of a contract enters as the second variable. The significance of this factor is probably associated with the contract miner terminability issue that was finally resolved in the *Swank* decision.<sup>219</sup> For Model IV, which encompassed the capital gains cases, the first variable listed pertained to an advance payment before production (ADVANCE), followed by the market price variable (REVMKT). Where there was an advance

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desire to possess economic interest to have percentage depletion available. Many times, however, a taxpayer wished to avoid the presence of economic interest and, thus, percentage depletion. This was the situation where capital gains were desired outside of I.R.C. § 631(c) (West 1967). In other situations taxpayers might desire not to possess economic interest because they do not want the income taxable to them, or they want it treated as a return of capital. So, the success of the taxpayer is not always parallel to presence of economic interest.

<sup>219</sup> See *supra* notes 176-78 and accompanying text.

payment, the tendency was to find that economic interest was not possessed by the taxpayer because the income was less contingent.

Appendix 2 reveals the results for cases according to the decade in which they were decided, and, as can be seen, the variables included in the models differed substantially from period to period. The only variable consistently appearing in the models was the most important one discussed above, the market price (REVMKT). That variable's prominence demonstrates that it has been consistently applied by Tax Court judges over a long period of time and a wide range of cases. During the 1960s, however, the most significant variable (TERM) related to the term of the natural resource arrangements at issue in those cases. The decisions in that decade followed the *Parsons* decision which indicated that the terminability factor was influential in the finding of an economic interest.<sup>220</sup> During that time period, the Tax Court had agreed with the Service that a short-term contract could, by itself, negate possession of an economic interest. That position, of course, is no longer correct.<sup>221</sup>

In view of the differences among the variables examined over the time periods, a conclusion might be reached that the Tax Court was not consistent in applying the variables. Examination of the types of economic interest cases heard by the court indicates, however, that another more probable reason exists. Also, Appendix 2 provides a breakdown of the cases by type for each decade. This breakdown shows that most of the oil and gas percentage depletion cases were decided early, while the hard mineral and capital gains cases arose in the later years. Apparently, the oil and gas issues on economic interest generally became a settled area after the first two decades, with the other types of cases starting to appear at a later date.

One possible reason for such a pattern of cases is that the discovery depletion provisions were not utilized much by the hard mineral developers, who did not obtain the benefit of

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<sup>220</sup> See *supra* note 175 and accompanying text.

<sup>221</sup> See *supra* notes 176, 181-82 and accompanying text.

percentage depletion until 1932.<sup>222</sup> The oil and gas developers, on the other hand, took advantage of the generous allowances starting in earlier years.

The results of the quantitative analysis support the conclusion that the Tax Court has generally applied factors in such a way as to promote the policy established by Congress in the early revenue acts.<sup>223</sup> The market price variable appeared as the most dominant of all, demonstrating the importance of the income factor of the economic interest definition. The investment factor, however, is also required and its variables were also included as significant. By observing the change in the types of cases over the period involved in this study, it can be seen that some areas are more settled, and, therefore, more certain for planning purposes than others.

#### CONCLUSION

In deciding the issue of whether an economic interest is present, Congress indicated that the risk incurred by the producer was to be rewarded as a means to encourage the exploration and development of new resources. That encouragement, introduced as discovery depletion, was initially offered as natural resources became identified as essential for the country's well-being. Since the discovery depletion provisions were difficult to administer, percentage depletion followed as a substitute. Further, because the deduction could exceed the actual cost incurred, the policy feature was retained.

The evolution of economic interest has not changed the policy of encouraging the exploration and development of new resources, rather it has evolved as a means to apply that policy to the complicated transactions contracted to by taxpayers. The Supreme Court has, almost without exception, rendered decisions to keep the encouragement available to those taxpayers who indeed incur the risk. As future tax reform proposals emerge, Congress will have to decide if past policy is still relevant to the demands of natural resources.

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<sup>222</sup> See *supra* note 74 and accompanying text.

<sup>223</sup> See *supra* notes 50, 68 and accompanying text.

## APPENDIX I

SUMMARY OF RESULTS  
Summary of Stepwise Results  
for All Tax Court Cases  
(Model I)

Step* No.	Term Entered	Improvement		Goodness-of-fit	
		Chi-Square	P-Value	L	P-Value
0	—	—	—	122.139	0.000
1	REVMKT	35.264	0.000	86.874	0.016
2	ACTMIN	11.970	0.001	74.905	0.093
3	OWNER	4.323	0.038	70.582	0.144
4	ADVANCE	2.883	0.090	67.698	0.180
5	INVEST	2.812	0.094	64.886	0.221

R<sup>2</sup> analog: 46.9%

Classification accuracy: 80.0%\*\*

\*The order of the listed variables indicates each variable's level of significance as it relates to the presence or absence of economic interest.

\*\*The classification accuracy is found by using the combination of the variables given for a model to classify the Tax Court cases used to find the significant variables.

Summary of Stepwise Results for Percentage Depletion  
Oil & Gas Observations  
(Model II)

Step No.	Term Entered	Improvement		Goodness-of-fit	
		Chi-Square	P-Value	L2	P-Value
0	—	—	—	53.111	0.001
1	REVMKT	37.108	0.000	16.003	0.855
2	INVEST	6.096	0.014	9.908	0.992

R<sup>2</sup> analog: 81.3%

Classification accuracy: 90.9%

Summary of Stepwise Results for Percentage  
Depletion Hard Mineral Observations  
(Model III)

Step No.	Term Entered	Improvement		Goodness-of-fit	
		Chi-Square	P-Value	L2	P-Value
0	—	—	—	38.187	0.024
1	REVMKT	9.680	0.002	28.507	0.159
2	TERM	4.295	0.038	24.212	0.283
3	OWNER	2.932	0.087	21.280	0.442
4	ACTMIN	3.669	0.055	17.611	0.673

R<sup>2</sup> analog: 53.9%

Classification accuracy: 79.5%

Summary of Stepwise Results for Capital Gain Observations  
(Model IV)

Step No.	Term Entered	Improvement		Goodness-of-fit	
		Chi-Square	P-Value	L-2	P-Value
0				27.811	0.087
1	ADVANCE	4.212	0.040	23.600	0.169
2	REVMKT	3.953	0.047	19.646	0.293

R<sup>2</sup> analog: 29.4%

Classification accuracy: 75.0%



## APPENDIX 2

ANALYSIS OVER TIME  
Variables Entered by Decade

Order of Variable Entered	Decade				
	1930s	1940s	1950s	1960s	1970s*
1	REVMKT	REVMKT	REVMKT	TERM	MINOWN
2	INVEST	BUSACT	GUARSLACTMIN		
3		OWNER MI-	AD-		
4		NOWN VANCE	BUSACT		
Total Cases	17	37	22	34	30

\*Includes cases in the 1980s.

## Summary of Results by Decade

Measure	1930s	1940s	1950s	1960s	1970s
Goodness-of-fit					
L <sup>2</sup>	.988	1.000	1.000	.391	.363
R <sup>2</sup> analog:	95.0%	92.3%	100.0%	51.1%	14.2%
Classification					
Accuracy:	94.1%	94.6%	100.0%	79.4%	66.7%

## Types of Cases by Decade

Type of Case	Decade				
	1930s	1940s	1950s	1960s	1970s**
Percentage De- pletion Oil & Gas	17	30	2	4	2
Percentage De- pletion Hard Materials	0	3	8	17	11
Capital Gains	0	3	9	12	16
Other	0	1	3	1	1
Totals	17	37	22	34	30

\*\*Includes cases in the 1980s.

## APPENDIX 3

## INDEPENDENT VARIABLES

*Variable 1.* OWNER - Taxpayer was fee owner of the land containing the natural resource.

In *Commissioner v. Southwest Exploration Co.*,<sup>224</sup> the Supreme Court stated that it was considering for the first time a situation where an owner of adjoining land, not even possessing a leasehold in the natural resource, was allowed an economic interest.<sup>225</sup> That case was not representative of most other cases. It did, however, stress that ownership or a right to the mineral is an important, though not necessary, criterion.<sup>226</sup> If a taxpayer at some point in time was a fee owner of the land containing the natural resource, then this fact would be beneficial in establishing an in-place mineral investment.

*Variable 2.* TERM - The length of the arrangement was greater than, or less than, one year.

During the time period between *Parsons v. Smith*<sup>227</sup> and *United States v. Swank*<sup>228</sup> the Tax Court treated the short-notice clause as very important in establishing an investment. Even though the *Swank* decision declared that such importance should not be attached to terminability, this variable was in fact used for a period of time, even possibly preceding *Parsons*. Terminability, therefore, is included as a variable to determine its significance as a factor in the history of economic interest cases.

Upon examination of some of the cases, the Tax Court appeared to carefully scrutinize the short-notice clause in cases which included an arrangement with the term under one year. The main concern of the court was that the miner should have sufficient time to extract substantially all of the resource. Given this concern, the one-year mark will be the cutoff for the terminability factor.

*Variable 3.* INVEST - Investment in roads, immovable equipment, or structures was made by the taxpayer.

Depletion for tax purposes is a deduction allowed for the decline in value of an in-place mineral investment. To establish what the investment consists of, the cost of the resource and the cost of preparing the property for development is considered. If a cost was subject to depreciation, depletion would not be available for that cost as a means of capital recovery.

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<sup>224</sup> 350 U.S. 308 (1956).

<sup>225</sup> *Id.* at 315.

<sup>226</sup> *Id.*

<sup>227</sup> 359 U.S. 215 (1959).

<sup>228</sup> 451 U.S. 571 (1981).

The Court in *Parsons v. Smith*<sup>229</sup> identified cost recovery as a factor to be considered through depreciation rather than depletion.<sup>230</sup> In that case, the contract miners' investment was solely in moveable equipment recoverable through depreciation.<sup>231</sup> In other types of cases, investments in roads, immovable equipment, and structures relating to only one mine location would be considered an additional investment in the mineral in place due to the nature of the expenditure. Therefore, since this factor has been identified by the Supreme Court, it will be treated as an independent variable.

*Variable 4. OWNEXT - Ownership of the mineral at time of extraction.*

When trying to evaluate the investment factor of the economic interest definition, the courts look for an element of control over the resource. That control may be control over the mineral immediately upon extraction. Ownership of the mineral before it is sold demonstrates a taxpayer's investment to be recovered from the mineral sale.

The *Parsons* Court made reference to the fact that the contract miners did not own the mineral after extraction. Ownership of the mineral at all times remained in the landowners, who later sold the coal. The miners' investment in labor and other expenses, therefore, did not lead to their ownership.

Ownership of the coal after extraction is not considered as mandatory for the presence of economic interest. The type of arrangement involved must be examined. For example, a taxpayer who transfers a working interest while retaining an overriding royalty or a net profits interest, will not own the mineral upon extraction. That taxpayer, providing the other necessary requirements are met, possesses an economic interest. Nevertheless, the existence of ownership of the mineral upon extraction would help support an economic interest.

*Variable 5. GUARSL - Guaranteed quantity the taxpayer must sell.*

The income factor of the economic interest definition provides that the income must transpire from mineral extraction and sale. This requisite has been an obstacle for many taxpayers who wish not to possess an economic interest. If a taxpayer owning land containing a natural resource, which is a capital asset, enters into an agreement to sell the mineral, then capital gain treatment would presumably be the objective. The arrangement must specify the quantity or the taxpayer is deemed to be a lessor; thus, he retains economic interest because the quantity was measured in connection with the extraction process. This factor was initially noticed in *O'Connor*<sup>232</sup> and was detected in many other cases involving capital gains.

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<sup>229</sup> 359 U.S. 215.

<sup>230</sup> *Id.* at 255.

<sup>231</sup> *Id.* at 217.

<sup>232</sup> *O'Connor v. Commissioner*, 78 T.C. 1 (1982).

*Variable 6. MINOWN* - Mineral Goes to the original land or lease owner.

In all cases, the courts made reference to the final disposition of the mineral.<sup>233</sup> If the mineral was returned to the original owner of the land containing the resource, or to the owner of a lease with interest in the mineral, then close scrutiny of the income side of the definition was applied. This factor is included in this study to determine if the final disposition of the mineral was significant.

*Variable 7. MINPMT* - Minimum received guaranteed payment.

One part of the policy goals behind percentage depletion is to reward the risky nature of the exploration and development of the mineral. If that risk is somehow offset within the structure of the arrangement, then the presence of economic interest is questioned.<sup>234</sup> A guaranteed payment to the taxpayer would have such an effect.

The information for this variable is traced to the actual contract, if any, which establishes the amount of revenue the taxpayer receives. If a certain dollar amount is guaranteed to be paid to the taxpayer, regardless of production, then this variable will be considered to be present. This factor is not the same as a production payment which states that a certain dollar amount is payable out of future production. A production payment is not guaranteed—it relies on the actual production. Therefore, this factor looks at an amount to be paid in the future without regard to production.

*Variable 8. ADVANCE* - Advance payment before production.

Many contracts in the natural resource taxation area stipulate an immediate cash payment in addition to other future consideration.<sup>235</sup> This immediate pre-production payment would contribute to the reduction of risk; thus, the taxpayer might be presumed to have not looked to extraction for a source of income. Given other facts present in such cases entailing advance payments, such payments are sometimes classified as advance royalties, and other times as proceeds from a sale.

*Variable 9. REVSING* - Single source of revenue.

Another factor which relates to the inherent nature of risk within the second factor of the economic interest definition is the source of the taxpayer's revenue. The taxpayer is supposed to look to the sale of the mineral for the revenue and, accordingly, the source of that revenue is presumably important.

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<sup>233</sup> See, e.g., *Parsons v. Smith*, 359 U.S. 215 (1959); *United States v. Swank*, 451 U.S. 571 (1981).

<sup>234</sup> See *supra* note 119 and accompanying text.

<sup>235</sup> See *Helvering v. Elbe Oil Land Development Co.*, 303 U.S. 372 (1938).

Having revenue received from only one party instead of several would point towards a reduction of risk.<sup>236</sup> If an arrangement provided that all of the taxpayer's mineral be sold to one party, then the courts might surmise that the evidence suggests the presence of guaranteed income. Consequently, the existence of economic interest would also be in doubt.

*Variable 10. REVMKT - Revenue tied to the market price.*

For a taxpayer whose revenue is tied directly to the price of the mineral on the market, such uncertainty indeed establishes a high degree of risk. The taxpayer is at the mercy of uncontrollable economic influences whereby there is no guarantee for recouping his investments. Therefore, presence of this variable helps support the possession of economic interest.

The forms of arrangements which are tied to the market price are varied. Lessors may receive revenue based on a market price per ton, reserve a fractional royalty based on gross sales, or retain a net profits interest. Lessees who have control of the mineral after extraction can sell on the market or to a single purchaser at rates contingent on market prices. Other combinations are also possible. In the cases analyzed, if the revenue of the taxpayer was tied directly to the market price of the mineral, then presence of this factor was indicated.

*Variable 11. BUSACT - Main business activity.*

The Tax Court might consider other types of factors when deciding whether or not economic interest is present. The court is to look at the substance of the arrangement to apply the intent of Congress regarding both capital recovery and exploration and development encouragement. In doing so, the main business activity of a taxpayer may be a key factor in a case which has a high degree of uncertainty as to its outcome. In this situation, the court might consider that a taxpayer whose livelihood depends almost entirely on natural resource production deserves the benefit of the doubt and should be rewarded for the risk involved. On the other hand, a taxpayer whose natural resource connection is merely a sideline business, or possibly a tax shelter, might not receive the same disposition from the court. In *Parsons v. Smith*,<sup>237</sup> the taxpayer trying to claim the presence of economic interest was a road builder by trade, and the contract mining was temporary. In *United States v. Swank*,<sup>238</sup> the taxpayer was in business as a mine operator.<sup>239</sup>

*Variable 12. ACTMIN - Taxpayer was the actual miner.*

Whether the taxpayer was the actual miner might have some influence over the decision with reasons similar to those of the preceding variable. While

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<sup>236</sup> See *supra* note 171 and accompanying text.

<sup>237</sup> 359 U.S. 215 (1959).

<sup>238</sup> 451 U.S. 571 (1981).

<sup>239</sup> *Id.* at 572.

at first glance variables 11 and 12 look similar, they are in fact not the same in many of the observed cases. For example, an oil company owning many leases might sublease some of them to others who perform the actual drilling and operating. In addition, situations occur where taxpayers who are not in the business of extracting natural resources use heavy equipment to strip mine coal in periods of slack activity. This was the case in *Parsons v. Smith*,<sup>240</sup> where the taxpayer was in the business of road building. Because of these types of cases, variables 11 and 12 are not one and the same.

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<sup>240</sup> 359 U.S. 215 (1959).

## APPENDIX 4

## ECONOMIC INTEREST TAX COURT CASES

The following cases were used in the economic interest analysis:

Adkins, 51 T.C. 957 (1969); Albritton, 24 T.C. 903 (1955); Badger Oil Co., 42 B.T.A. 521 (1940); Bankers Mortgage Co., 1 T.C. 1258 (1943); Bankline Oil Co., 33 B.T.A. 910 (1936); Barry, Par. 55,012 P-H Memo TC (1955); Beach Petroleum Corp., Ltd., par. 46,192 P-H Memo TC (1946); Blake, 20 T.C. 721 (1953); Bolling, 37 T.C. 754 (1962); Burke, 5 T.C. 1167 (1945); Caldwell Oil Corp., 47 B.T.A. 707 (1942); Carl Maier Syndicate, Par. 46,226 P-H Memo TC (1946); Clifton, Par. 58,065 P-H Memo TC (1958); Cline, 67 T.C. 889 (1977); Collins, 56 T.C. 1074 (1971); Cook Drilling Co., 38 B.T.A. 291 (1938); Cooper, 39 T.C. 253 (1962); Costantino, Par. 70,043 P-H Memo TC (1970); Crawford, Par. 44,098 P-H Memo TC (1944); Cullen, 41 B.T.A. 1054 (1940); Dann, 30 T.C. 499 (1958); Day, 54 T.C. 1417 (1970); Dearing, et. al., 36 B.T.A. 843 (1937); Desrosiers, Par. 62,047 P-H Memo TC (1962); Donnell, 48 T.C. 552 (1967); Elbe Oil Land Development Co., 34 B.T.A. 333 (1936); Esperson, Par. 41,086 P-H Memo TC (1941); F. & G. Sand and Gravel Co., Inc., Par. 76,360 P-H Memo TC (1976); Felix Oil Company, Par. 42,662 P-H Memo TC (1942); Fink, 29 T.C. 1119 (1958); Fleming, Par. 72,155 P-H Memo TC (1972); Fleming, 43 B.T.A. 229 (1941); Gap Anthracite Co., Par. 72,189 P-H Memo TC (1972); Glenn, 39 T.C. 427 (1962); Godbold, 82 T.C. 73 (1984); Godshall, 13 T.C. 681 (1949); Gray, 13 T.C. 265 (1949); Green, 35 T.C. 1065 (1961); Hair, Par. 67,022 P-H Memo TC (1967); Hamme, Par. 53,100 P-H Memo TC (1953); Hammonds, 38 B.T.A. 4 (1938); Hansen, Par. 75,343 P-H Memo TC (1975); Hardesty, 43 B.T.A. 245 (1941); Harrington, 48 T.C. 939 (1967); Herndon Drilling Co., 6 T.C. 628 (1946); Holbrook, 65 T.C. 415 (1975); Holloway, 10 T.C. 1045 (1948); Hudson, 11 T.C. 1045 (1945); Hugh Hodges Drilling Co., 43 B.T.A. 1045 (1941); Ima Mines Corp., 32 T.C. 1360 (1959); Iske, Par. 80,061 P-H Memo TC (1980); Island Creek Coal Co., 30 T.C. 70 (1958); Ison, Par. 63,308 P-H Memo TC (1963); Jahn, 58 T.C. 452 (1972); Jantzer, 32 T.C. 161 (1959); Japhet, 3 T.C. 86 (1944); Johnson, Par. 63,321 P-H Memo TC (1963); Jones, 31 B.T.A. 55 (1934); Kasey, 33 T.C. 656 (1960); Kennedy Mining & Milling Co., 43 B.T.A. 617 (1941); Kiesau Petroleum Corp., 42 B.T.A. 69 (1940); Kirby Petroleum Co., 2 T.C. 1258 (1943); Kittle, 21 T.C. 79 (1953); Laird, 35 B.T.A. 75 (1936); Landreth, 50 T.C. 803 (1968); Langenfelder, 69 T.C. 378 (1977); Lawson, Par. 63,179 P-H Memo TC (1963); Lawton, 33 T.C. 47 (1959); Lee, 42 B.T.A. 1217 (1940); Legg, 39 T.C. 30 (1962); Leshner, 73 T.C. 340 (1979); Louisiana Land and Development Co., 6 T.C. 172 (1946); Majestic Oil Corp., 42 B.T.A. 659 (1940); Matagorda, 29 T.C. 1060 (1958); McCall, 37 T.C. 674 (1962); McCall, 27 T.C. 133 (1956); McLean, 41 B.T.A. 565 (1940); Mellen, Par. 63,089 P-H Memo TC (1963); Merritt, 39 T.C. 257 (1962); Missouri River Sand Co., 83 T.C. 193 (1984); Mullins, 48 T.C. 571 (1967); Murchison, 28 B.T.A. 257 (1933); Murphy, 6 T.C. 294 (1946); North Range Mining Co., 46 B.T.A. 296 (1942); O'Connor, 78 T.C. 1 (1982); Olinger, 27 T.C. 93 (1956); Pacific Cement & Aggregates, Inc., 31 T.C. 36 (1958); Pearl Oil Co., 40 B.T.A. 147 (1939); Pleasanton Gravel Co., 64 T.C. 510 (1975); Pockrandt, Par. 62,260 P-H Memo

TC (1962); Porter Royalty Pool, Inc., 7 T.C. 685 (1946); Procter & Gamble Mfg. Co., Par. 46,041 P-H Memo TC (1946); Puckett, Par. 64,040 P-H Memo TC (1964); Ramey, 47 T.C. 363 (1967); Rawco, Inc., Ltd., 37 B.T.A. 128 (1938); Reagon, Par. 73,266 P-H Memo TC (1973); Reid, Par. 72,205 P-H Memo TC (1972); Remer, 28 T.C. 85 (1957); Richards, Par. 59,205 P-H Memo TC (1959); Ridley, 58 T.C. 439 (1972); Roeser & Pendleton, Inc., 15 T.C. 966 (1950); Romano, Par. 67,071 P-H Memo TC (1967); Rose, 56 T.C. 185 (1971); Royalton Stone Corp., Par. 66,109 P-H Memo TC (1966); Ruston, 19 T.C. 284 (1952); Sager, Par. 62,121 P-H Memo TC (1962); Schermerhorn Oil Corp., 46 B.T.A. 151 (1942); Simms, 28 B.T.A. 1050 (1933); Sparkman, Par. 72,201 P-H Memo TC (1972); Standard Oil Co., 54 T.C. 1099 (1970); Stone, 50 T.C. 113 (1968); Strutzel, 60 T.C. 969 (1973); Sutton, 35 B.T.A. 348 (1937); The Oil City Sand and Gravel Co., 32 T.C. 31 (1959); Trembley, Par. 48,270 P-H Memo TC (1948); Utah Alloy Ores, Inc., 33 T.C. 917 (1960); Victory Sand and Concrete, Inc., 61 T.C. 407 (1974); Walker, 55 T.C. 522 (1970); Washburn, 44 T.C. 217 (1965); Weaver, 72 T.C. 594 (1979); Weeks, 31 B.T.A. 623 (1934); West, 3 T.C. 431 (1944); West Production Co., 41 B.T.A. 1043 (1940); Wilson, 26 T.C. 474 (1956); Wineberg, Par. 61,336 P-H Memo TC (1961); Wood, Par. 68,178 P-H Memo TC (1968)



## APPENDIX 5

## DESCRIPTION OF LOGIT ANALYSIS

Logit analysis is just one type of model within the vast area of log-linear analysis. Log-linear analysis is similar to ordinary regression in several ways, with both building predictive models. If the dependent variable is coded as dichotomous rather than on an interval scale, then ordinary regression shows how the probability of the occurrence of a response is affected by variations in the independent variable.<sup>241</sup> Log-linear analysis, on the other hand, differs in that changes in the independent variables do not affect the probability, but changes do affect conditional odds of the dependent variable.<sup>242</sup>

Conditional odds involves the chance that a particular item will fall into one category, given prior knowledge of its group membership. The following is a table created to demonstrate the concept of conditional odds:

	Education		Total
	College Graduate	Non-College Graduate	
Voted	485	626	1,111
Not Voted	239	701	940
Total	724	1,327	2,051

The frequency that an individual drawn at random would fall in one category as opposed to the other is called the basic marginal odds. It is found by dividing the total voted by the total not voted, or  $1,111/940 = 1.18$  (just over one-to-one). Conditional odds are calculated with the prior knowledge of group membership; therefore, given that an individual is a college graduate, the odds of having voted relative to not voted would be  $485/239 = 2.03$ , or about two-to-one. The conditional odds for individuals without a college degree would be  $626/701 = .89$ , or less than one-to-one. In log-linear analysis, the two conditional odds would then be compared to arrive at a single summary statistic called the "odds ratio," which is the workhorse of log-linear models.<sup>243</sup> For the above example, the odds ratio is found by dividing the first conditional odds by the second; thus  $2.03/.89 = 2.28$ . This is interpreted as saying that the odds on voting are 2.28 times greater among individuals with college degrees than among individuals without college degrees.

The odds ratio indicates whether relationships exist between variables, having a lower limit of 0 with no upper limit. An odds ratio of 1 indicates that no relationship is present between the variables. A ratio of less than 1 indicates a negative relationship, and a ratio of greater than 1 signifies a direct covariation.

<sup>241</sup> KNOKE & BURKE, *supra* note 216, at 7.

<sup>242</sup> *Id.* at 7-8.

<sup>243</sup> *Id.* at 10.

The general log-linear model does not distinguish variables into independent and dependent categories because it attempts to find relationships among all of the variables present. Logit analysis, on the other hand, builds a model around a dependent variable and any number of independent variables. A parsimonious logit model will, however, not include all of the independent variables, and therefore, will not attempt to explain all of the effects on the dependent variable. A model which does attempt to explain all of the effects is referred to as "saturated," and would most likely be too cumbersome for interpretational purposes. The procedure to be used here has the logit model initially containing no independent variables, with variables then added only if their inclusion significantly enhances the model's predictability. The variables are added in the order of the most significant ones first. This is a forward stepwise selection process. A backward elimination process can also be used, but is more time-consuming and inefficient since a saturated model is initially established, and the result would be that variables which do not contribute to the model's goodness-of-fit are eliminated.

The logit model is based on the cumulative logistic probability function:

$$P_i = \frac{1}{1 + e^{-(\alpha + \beta X_i)}}$$

where,

$P_i$  is the probability that a decision-maker will make a certain choice, given prior knowledge of  $X_i$

$X_i$  is the value of the independent variable for the  $i$ th variable;

$e$  is the base of natural logarithm (approximately 2.718);

$\alpha$  is the constant;

$\beta$  is the coefficient of the independent variable  $X_i$ <sup>244</sup>.

Within the terminology of this research study,  $P_i$  will be the probability that economic interest is not present given the knowledge of only the significant independent variables included in the model. The probability that economic interest is present can be calculated as:  $1 - P_i$ .

#### A. Testing for Goodness-of-Fit

After the logit model has been identified, an assessment must be made as to how well the model fits the data. For this

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<sup>244</sup> R. PINDYCK & D. RUBINFELD, *ECONOMETRIC MODELS AND ECONOMETRIC FORECASTS* 247 (1976).

evaluation a likelihood-ratio statistic is used, with the equation being:

$$L^2 = 2 * O * \ln(O/E)$$

where,

$L^2$  is the likelihood-ratio statistic;

O is the observed cell frequencies;

E is the expected cell frequencies.

$L^2$  compares the estimated expected cell frequencies to the observed, and follows the chi-square distribution with the degrees of freedom equal to the number of parameters set to have no effect on the dependent variable.<sup>245</sup> The larger the  $L^2$  is in relation to the degrees of freedom, the more the expected cell frequencies differ from the actual cell frequencies. Conversely, the smaller the  $L^2$  relative to the degrees of freedom, the better the expected cell frequencies fit the observed frequencies.

The interpretation of  $L^2$  is opposite of that for the traditional chi-square tests of independence. The null hypothesis is usually sought to be rejected when using the chi-square test. With  $L^2$ , however, the model which has been established is desired to be accepted; thus, the reason a small  $L^2$  relative to degrees of freedom is preferred.

One limitation of logit analysis is that it does not produce an  $R^2$  value which is used in multiple regression to measure the extent to which an independent variable accounts for the variation in the dependent variable. To overcome this limitation an  $R^2$  analog has been used as an alternate, but similar, measure. An  $L^2$  for the "baseline" model is established as a standard for which improvements will be measured. The baseline  $L^2$  is computed for the initial step of the forward stepwise procedure when none of the independent variables are considered to affect the dependent variable. The amount of variance in the cell frequencies not explained by any of the independent variables is indicated by the baseline  $L^2$ . Subsequently, an  $L^2$  is computed for the model which includes all of the significant independent variables (alternative model). Using the two  $L^2$  values the  $R^2$  analog is:

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<sup>245</sup> KNOKE & BURKE, *supra* note 216, at 30.

baseline  $L^2$  - alternate  $L^2$

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baseline  $L^2$

Thus, the proportion of the baseline  $L^2$  that is accounted for by the alternative  $L^2$  is found. If a high proportion of the baseline  $L^2$  is accounted for, then a satisfactory fit to the data may be implied.<sup>246</sup>

### B. Computer Program

In this study, the stepwise Logistic Regression (LR) program of the BMDP statistical software package was utilized.<sup>247</sup> The output consists of the  $L^2$  at each step of the selection process to evaluate goodness-of-fit and compute the  $R^2$  analog. Also, for each combination of the independent variables, the predicted probabilities are provided so that the classification accuracy of the observations can be easily computed.

Another very helpful statistic is furnished in the output at each step. An improvement chi-square with degrees of freedom is used to test the hypothesis that the term entered at that step significantly improves prediction.<sup>248</sup> The formula for this chi-square is:

$$\text{Improvement } X^2 = 2 * (\ln(\text{MLR}))$$

where,

$\ln(\text{MLR})$  is the natural logarithm of the maximum likelihood ratio which is found by subtracting the current log likelihood from the log likelihood for the previous step.<sup>249</sup>

The improvement chi-square follows the interpretation of the traditional chi-square tests and, therefore, a small p-value indicates a significant improvement over the previous step. There-

<sup>246</sup> *Id.* at 40.

<sup>247</sup> BMDP Statistical Software Revised Printing (1983).

<sup>248</sup> *Id.* at 333.

<sup>249</sup> *Id.*

fore, for this study a maximum p-value of .10 is used so that only the significant variables are included.