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A FINANCIAL EVALUATION OF CARRIAGE CONTRACTS IN THE U.S. INTERSTATE NATURAL GAS MARKET

by

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ABSTRACT

Since 1979, interstate natural gas pipelines switched from primarily buying, transporting, and selling their own gas to providing carriage services, transporting for a fee gas owned by others. This thesis tests two hypotheses. Pipelines earn lower rates of return and profit margins from carriage services than from natural gas sales. Nonetheless, the carriage volume share of throughput is getting larger.

Data for this thesis are taken from financial and operating statements provided by pipelines to the Federal Energy Regulatory Commission (FERC). To evaluate carriage contracts, gas utility accounts are allocated into natural gas sales and carriage components. Profit margins and rates of return are calculated separately. Division of common costs and assets is based on physical units of gas delivered. Dollar amounts are used only to allocate certain current assets.

Results derived from account allocations support the two main hypotheses. From 1979-1988 carriage services reported positive profits in only four years, three of which were 1986-1988. Sharp rises in carriage profits are seen in two instances, in 1983 when pipelines increased carriage volumes through Special Marketing Programs (SMPs) and in 1986 when many pipelines became open access transporters. During the

same time period, the volume of gas transported by carriage contracts increased from 22% of throughput in 1979 to 71% in 1988.

Possible reasons for lower carriage profits include the following. First, before 1983, most carriage volumes were pipelines transporting gas for other pipelines. If equal volumes were exchanged, price and profits were irrelevant. Second, pipelines provide fewer services with carriage contracts. With gas sales, pipelines obtain, aggregate, and broker supplies. Third, pipelines reduce their financial risk with carriage contracts by not taking title to the commodity. Fourth, rates are authorized by federal regulators. Fifth, pipelines lose their monopsonistic/monopolistic market power with carriage contracts. After 1986, gas sales profits declined while carriage profits were relatively constant. Remaining pipeline market power associated with gas sales may be declining because of increased competition.

Given that pipeline profits are lower for carriage services, consumers and producers can benefit by dealing directly with each other. Much of the recent increases in carriage gas volumes are due to available customer supply choices associated with open access.

TABLE OF CONTENTS

Page

APPENDIXES

LIST OF FIGURES

LIST OF TABLES

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Chapter 1

INTRODUCTION

The structure of the U. S. interstate natural gas market experienced a multifaceted shift during the past decade. Three major changes can be identified: after 35 years of strict federal regulation, controls on wellhead gas prices were steadily phased out beginning in 1978 (Schlesinger 1990) and will be completely gone by 1993 (John S. Herold 1989a), spot purchases of gas, previously nonexistent, steadily rose to dominate the market (figure 1), and pipelines switched

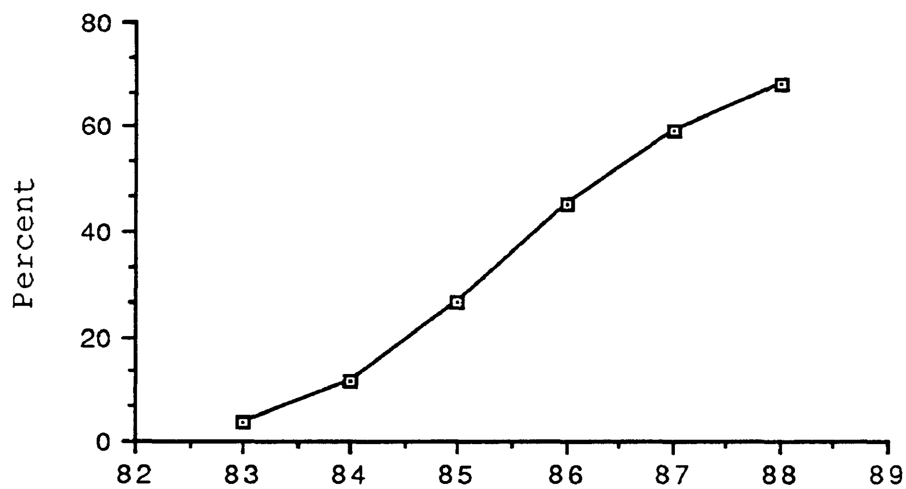


Figure 1. Spot Purchases of Natural Gas as a Percentage of U. S. Gas Consumption, 1982-1988

Source: Graph based on data in Schlesinger, B. 1990. "Natural Gas Trading in Physicals and Futures." Energy in the News. (New York Mercantile Exchange) (Winter): 3.

from primarily transporting and selling their own gas to providing carriage services, transporting gas owned by others for a fee. This thesis examines the last change, evaluating the carriage contracts provided by interstate pipelines between 1979-1988.

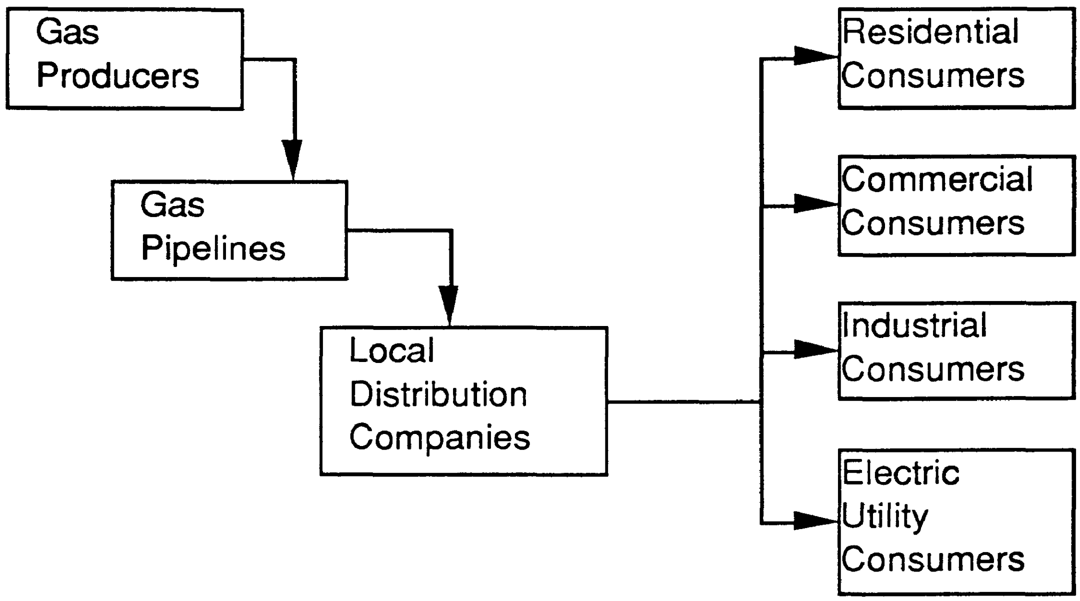
Traditionally pipelines operated as private carriers, purchasing gas from producers and reselling it to local distribution companies (LDCs). Local distribution companies in turn resold the gas to the ultimate consumer (figure 2).

Although the physical movement of gas through pipelines remains the same, new alternative methods of buying and selling are now available. Consumers can directly contract with suppliers. Marketing companies match producers to end users or buy and sell natural gas outright. In these arrangements, pipelines and sometimes LDCs are contracted for carriage only. They are not, as in the traditional market, both transporter and merchant (Schneier 1990).

Natural gas transported by carriage contract is termed transportation gas and may be be owned by a producer, local distribution company, natural gas marketer, a large consumer, or another pipeline. In contrast, resale gas is gas owned by the transmitting pipeline (Williams and Meyers 1987).

Although pipeline resale gas is still sold, it is increasingly being replaced by transportation gas. Purchases

Traditional Gas Markets



Current Gas Markets

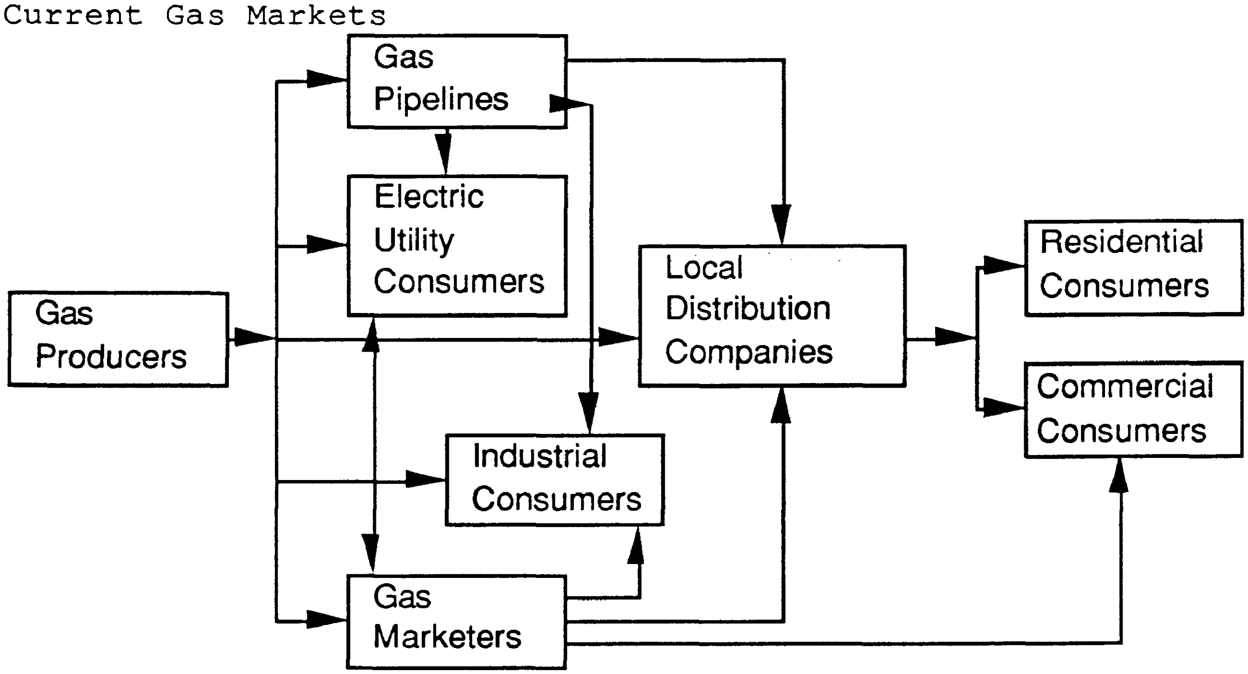


Figure 2. Traditional and Current Natural Gas Market Structure

Source: Schneier, L.W. 1990 "Hedging with Natural Gas Futures" Energy in the News. (New York Mercantile Exchange) (Winter): 6

of nonpipeline gas, once uncommon are now prevalent in all areas of the continental United States except the extreme northeast.

One of the major questions facing pipeline operators is to what extent should they continue as merchant rather than only providers of transportation? As merchants, pipeline operators provide a bundle of services. They transport the gas, acquire and aggregate supplies, broker the commodity, provide storage, and most important, offer peak demand security. Nearly all interstate pipelines provide both resale and transportation services (EIA 1989). Each segment must be looked at separately to determine benefits to the company.

The objective of the thesis is to test two hypotheses. Interstate natural gas pipelines earn lower rates of return and profit margins from carriage services than from gas sales. Nonetheless carriage volumes share of throughput is getting larger.

Possible reasons for lower carriage profits include the following. First, a large portion of carriage volumes are pipelines transporting gas for other pipelines. If equal amounts of services are exchanged, prices and profits are irrelevant. Second, pipelines provide fewer services with carriage contracts. With gas sales pipelines obtain, aggregate, and broker supplies. Third, pipelines increase their financial risk with gas sales. Pipelines take on additional risk by guaranteeing supplies and prices in contracts. Fourth, rates are authorized by federal regulators. It is politically easier to justify more profits when selling a higher priced good. Fifth, pipelines lose their monopsonistic/monopolistic power. Gains associated with pipeline market power are not realized without holding title to the commodity.

Federal regulators, more specifically, the Federal Energy Regulatory Commission (FERC), have a statutory interest in the operations of interstate pipelines. Among the FERC's responsibilities is ensuring that all natural gas pipeline rates and practices be just and reasonable (section 4 [a], the Natural Gas Act [NGA]). Such rates and practices must not be unduly discriminatory, or preferential (FERC 1985, 1987). Therefore, one class of customers, for example those buying resale gas, should not bear more costs than those buying only transportation services. However, if rates are truly "just and reasonable," resale profits could reflect additional services and greater pipeline financial risk. Greater profitability could also signify a certain amount of "monopolistic rent" protected by regulation.

Chapter 2

INDUSTRY BACKGROUND

The first long-distance all-welded pipeline was laid by the Magnolia Gas Company of Dallas, Texas in 1925. It stretched 217 miles between northern Louisiana and Beaumont, Texas. Previously gas was only used locally and often manufactured from coal (Peebles 1980). By the late 1920s, mid-continent gas had limited access to the markets of St. Louis, Omaha, Chicago, and Minneapolis-St. Paul. The metropolitan and industrial areas of the East Coast and New England were exclusively served by the declining supplies in Appalachia.

Much inducement for the federal regulation of interstate natural gas was the separation of the two markets. Appalachian production was declining while mid-continent gas, mostly a byproduct of oil exploration, was being shut in. Pipeline capacity was not yet available to transport gas to the East Coast.

Adjustment to declining Appalachian production was distorted by state regulatory intervention. States often held down prices in attempts to save indigenous industries. States did not, however, have the power to regulate the sale for resale (gas bought by local utilities to be resold, not consumed) of gas that crossed their borders (EIA 1989). The interstate market was free of any regulation. The result was an increase in gas transported out of producing states to obtain higher prices even though there were local shortages. Intrastate markets could not clear because of state regulated prices.

At the same time, many natural gas users believed that pipeline profits for interstate gas were too high and that pipelines were taking advantage of their natural monopsonistic/monopolistic market power. This led producing-state and consumer interests to seek federal regulation of the interstate market (Carpenter and others 1987).

Public Utility Holding Company Act

The first federal regulation affecting the natural gas industry was the Public Utility Holding Company Act of 1935 (PUCHA). More then 80% of the gas transmission firms were owned by larger holding companies. The PUCHA gave the Security and Exchange Commission the authority to investigate utility companies' finances. More notably, Title III of the originally proposed act made interstate natural gas pipelines common carriers (John S. Herold 1989b).

Oil pipelines had been common carriers since the Hepburn Act of 1906 (Peebles 1980). The Interstate Commerce Act of 1887 required most federally regulated transportation to be common carriers, but it excluded natural gas pipelines.

Common carrier status for the natural gas industry would have taken away the pipeline's control over capacity rights. Common carriers legally must offer capacity without discrimination and therefore could not favor their own gas. Most pipelines started as town distribution firms and have long owned the gas that flowed through their systems. Interstate pipeline operators strongly opposed replacing their resale gas with common carriage.

Technical arguments were also used against common carriage. Without owning the gas transported, opponents argued, pipelines could not handle demand fluctuations. Quick coordination of supplies could only be achieved through intracompany decisions (Carpenter and others 1987).

Natural Gas Act

Consequently, Title III of the PUCHA was removed during congressional debate (John S. Herold 1989b). Three years later it was redrafted and introduced as the Natural Gas Act of 1938 (NGA). The NGA assigned the responsibility of pipeline regulation to the Federal Power Commission (FPC). Essential features included certification of facilities, establishment of transportation rates, and obligations to serve. To obtain certification, pipelines had to demonstrate "public necessity and convenience." This was done by entering into long-term, often 15 to 20 years, sales and supply contracts. The act was designed primarily to protect the interests of consumers (Peebles 1980).

The portion of Title III mandating common carriage was eliminated in the NGA. Pipelines became private carriers transporting, for the most part, only their own gas. This market structure lasted until the early 1980s. The NGA did allow pipelines to sell transportation only services. However separate certification also showing "public necessity and convenience" was needed. (Carpenter and others 1987)

Following the NGA, the natural gas industry expanded consistently until the mid-1970s. Short-run demand was limited only by the existing pipeline networks and the stock of gas-using equipment. The growth in demand was so strong that unlike other energy sources, the industry never experienced fluctuating volumes during downturns of the economy.

Interfuel competition was relatively unimportant. Natural gas had a considerable price advantage over fuel oil, its main competitor. Gas supply was also readily available to the pipelines. Excess reserves were often shut-in waiting for markets to be developed.

1954 Phillips Decision

Before 1954, natural gas prices at the wellhead were unregulated. The NGA mandated federal regulation of pipeline-owned production but was ambiguous on the regulation of production from independent producers. The FPC's interpretation was that field prices were not under their jurisdiction (Carpenter and others 1987). In 1950 the congress tried to clarify the situation by passing the Kerr Bill which specifically exempted gas wellhead prices from FPC control. The bill was vetoed by President Truman (Peebles 1980).

Determining whether producer sales could be regulated became an issue when the Phillips Petroleum Company raised gas prices charged to the city of Milwaukee from 3¢ to 4¢ per mcf. Milwaukee, through the Wisconsin Public Service Commission, asked the FPC to fix the price at 3¢ per mcf (John S. Herold 1989b). In keeping with its 16-year-old policy that it had no regulatory authority over independent producers, the FPC ruled in favor of Phillips (Peebles 1980). Wisconsin, which received 90% of its gas supplies from Phillips, appealed. On 7 June 1954 the U.S. Supreme ruled against Phillips, mandating that the FPC regulate all wellhead prices of natural gas entering the interstate market (Sanders 1981).

The Phillips decision had many repercussions. It created two distinct markets for natural gas--a regulated interstate market and a nonregulated intrastate market (John S. Herold. 1989b). The price ceilings created a substantial boost for demand while at the same time reduced incentives for exploration and reserve replacement. Proven natural gas reserves declined after 1968. By the 1970s, federal price ceilings created shortages of flowing gas (Sanders 1981).

When natural gas consumption peaked in 1972, it was due less to a leveling off of demand than to a shortage of supply (Sawhill 1987). In attempts to remedy the worsening shortages, the FPC raised regulated price ceilings in 1971 and 1974. Unregulated intrastate market prices rose even faster. Very few new reserves were dedicated to the interstate market in favor of higher intrastate prices. In 1976 the average price for intrastate gas was more than twice the interstate price. To guarantee sources of supply, high gas-using industries moved to producing states such as Texas and Louisiana (Carpenter and others 1987).

Although transportation programs were to become an important feature of the gas surplus markets in the 1980s, the threat of gas curtailments in the mid-1970s created the initial incentive for the creation of carriage as a separate service. Early transportation programs, beginning with FPC Order 533, authorized interstate pipelines to transport customer-owned gas for high priority end users. "High priority" was defined by regulators to include only process, industrial feedstock, and commercial users of natural gas. FERC Order 27 later expanded the programs to include certain agricultural users, schools and hospitals (EIA 1989). Regulatory policy encouraged end users to switch to alternative fuels away from natural gas.

During the winter of 1976-1977, gas curtailments caused the temporary unemployment of more then a million workers in natural-gas-consuming industries. In an attempt to eliminate future shortages, the Carter administration proposed legislation to change the fundamental nature of natural gas market regulation. These shortages increased pressure on congress to pass the Natural Gas Policy Act of 1978 (NGPA), the first comprehensive natural gas bill in 40 years (Sawhill 1987).

Natural Gas Policy Act of 1978

Many groups argued for complete and immediate deregulation of natural gas wellhead prices and consumer interests resisted removing any price controls. After 18 months of debate, the Natural Gas Policy Act of 1978 (NGPA) was passed as a compromise (Carpenter and others 1987). The NGPA classified natural gas into 22 different categories based on age of field, depth of producing formation, and location. The most important distinction was age. So called "new" gas prices were to be raised to market clearing levels by 1985 and subsequently decontrolled. "Old" gas prices were to remain below market levels with increases for inflation only. The price of "deep" gas from wells deeper than 15,000 feet was deregulated immediately (Banks 1987). This was an attempt to reward increases of new supply without transferring rents to existing producers (Peebles 1980). To offset market differences, the NGPA extended federal price ceilings to include intrastate field markets (Carpenter and others 1987).

Deregulation took place at a time when the prices of alternative fuels were rising rapidly. Other petroleum markets were responding to uncertainty following the Iranian Revolution (Sawhill 1987). The FERC in May 1979 issued Order 30 encouraging fuel-switchable industries to burn gas purchased through carriage contracts. The immediate rise of fuel oil prices was considered more important than long-term gas supplies. The gas was transported under Section 311 of the NGPA which allowed interstate pipelines to transport gas on behalf of other pipelines and local distribution companies (LDCs). In issuing Order 30, FERC expanded Section 311 transportation to additional customer groups. Reversing previous policy, this program was the first transportation program aimed at increasing natural gas consumption.

The NGPA partial price deregulations created incentives to produce gas with high or no price ceilings. Gas in these categories were the most expensive to produce. Even though the gas was bought above market prices, pipelines could offset these purchases with their supplies of old gas.

Pipeline rates charged to customers are based on the weighted average cost of gas. In 1981 commonly held gas contract portfolios for pipelines had prices ranging from $1 to $11 per mcf. The national average price was only around $3 per mcf (Carpenter and others 1987). As a consequence, gas purchased at $11 per mcf was being sold at $3 per mcf.

Motivated by contractual service obligations to customers, pipeline operators rushed to sign up new reserves. Gas was often purchased at the maximum in the regulated gas categories. To compete for suppliers where price ceilings bound, other contract terms given to producers were sweetened. Clauses such as indefinite price escalators and high take-or-pay requirements were introduced. A take-or-pay provision in a contract is a promise to pay for a portion of the gas whether the gas is taken or not. Liability percentages jumped to the 80s and 90s during this period. Traditionally, take-or-pay percentages were in the 50 to 60 range. The intense competition for reserves made it difficult to obtain flexible terms in new contracts. Most of these contract provisions proved ill-suited to different market conditions (Carpenter and others 1987).

The "Gas Bubble"

In 1981 the world economy went into the most severe recession since the 1930s. Demand for oil and other energy products fell. Prices soon followed. Demand for natural gas also fell sharply. Gas supplies acquired by pipelines in long-term contracts were no longer needed. Producers who drilled wells in anticipation of higher prices could not find buyers. This was the beginning of the so-called "gas bubble" of excess deliverability (Banks 1987).

For the first time, gas faced head-to-head price competition with coal, electricity, and especially oil (Sawhill 1987). Instead of natural gas prices declining to be more competitive with substitutes, they began to rise. This was caused by inflexible pricing mechanisms and large pipeline take-or-pay obligations.

Pipelines facing declining sales stopped taking "old" gas with lower take-or-pay percentages and prices. High cost new gas with tough take-or-pay provisions was still taken since payment had to be made anyway. The loss of old gas from pipeline portfolios increased the weighted average cost of gas pipelines charged their customers. Higher prices further reduced demand (Carpenter and others 1987).

The long-term inflexible contracts and regulated pricing mechanism created an economic surplus. Prices and volumes could not change to meet new market conditions. Producers had shut in gas they wanted to sell at prevailing or even lower prices, but pipelines were restricted from selling it competitively. Pipelines at the same time had unutilized capacity.

This situation induced regulators, producers, and pipelines to change the fundamental structure of the natural gas industry. Pipelines aggressively expanded previous transportation programs established during the shortages of the 1970s. To retain existing customers, pipelines offered brokerage packages that became known as Special Marketing Programs (SMPs). The intent of SMPs was to keep fuel-switchable gas consumers from switching away from gas by offering them less expensive spot supplies. SMPs varied between pipelines and offered both resale and carriage services. The common feature was that nonfuel switchable customers were not eligible to participate in them. FERC justified this price discrimination on the grounds that these programs were aimed at retaining load. By increasing capacity utilization, fixed costs were spread out between more customers and led to lower rates even for captive core customers (EIA 1989).

By 1983 pipelines had exploited all the available legal options to abrogate high-cost supply contracts. Further attempts sought to cancel contracts on force majeure grounds. Pipelines cited unforeseen market forces as reasons to seek abrogation or renegotiation. In some SMPs, transportation of spot producer gas was contingent on delivered volumes being credited against the pipelines' take-or-pay obligations. Regardless of the SMP, transportation programs allowed pipelines to retain load, and thereby improve overall earnings. The existence of take-or-pay problems often contributed to the degree in which companies adopted transportation programs. Although in recent years, companies with no major liabilities have also expanded carriage services. Reasons other than take-or-pay liabilities must have contributed to their development (EIA 1989).

Most programs aimed at managing gas surpluses came from the private sector. FERC's role was mainly reactive (Carpenter and others 1987). In response to industry initiatives, FERC issued Orders 234-B and 319 to streamline transactions. Before August 1983 all transportation agreements still had to receive formal and often lengthy certification. FERC Orders 234-B for fuel switchable consumers, and 319 for "high priority" natural gas users allowed pipelines to use blanket certificates. Each carriage contract did not need separate authorization. More importantly transactions under Order 234-B of fewer than 120 days did not need prior FERC notification. This order essentially created the spot market. FERC was informed after, not before delivery of the gas (EIA 1989).

In May 1985, federal courts in Maryland held that SMPs and blanket certificates illegally discriminated among customers. The court concluded that the minor savings from spreading fixed costs over a larger customer base were insignificant compared to the extra costs captive customers paid by being denied access to market priced gas. In effect the rulings outlawed any spot market and transportation program not open to all buyers (John S. Herold 1989b).

In response to the Maryland court cases, the FERC issued Order 436 allowing pipelines to become open access transporters on a voluntary basis. Pipelines were not pleased with some of the provisions. In addition to nondiscriminatory access, the order allowed pipeline sales customers, mainly LDCs, to convert their contract demand volumes to firm transportation. Most carriers thought this would only aggravate their take-or-pay problems. Producers could replace pipeline sales to LDCs and at the same time receive payment from pipeline contracts (EIA 1989).

Consequently very few pipelines applied for certification. To urge pipelines to use 436 transportation, FERC denied extensions to SMPs. Order 436 meanwhile faced immediate legal challenges. It was ultimately remanded in 1987 in Associated Gas Distributors vs. FERC. The D. C. Circuit Court of Appeals affirmed open-access transportation and rate conditions. They remanded contract demand/firm transportation conversions and nondiscriminatory access provisions on the grounds they increased pipeline take-or-pay liabilities (John S. Herold 1989b). Two months later FERC issued Order 500 keeping the key provisions of Order 436 with modifications in response to the court's ruling.

The major developments and federal rulings leading to the separation of pipeline merchant and transportation functions are summarized in table 1.

Current Natural Gas Market

Currently most major and many smaller interstate pipelines are Order 500 transporters. Order 500 authorizes blanket certificates for transportation services, allows pipelines to selectively discount rates, allows pipelines to recover "prudent" take-or-pay buyout/buydown costs, and allows pipeline customers to convert contract demand volumes to firm transportation. Access is denied to producers if they do not credit transportation gas against pipeline take-or-pay liabilities.

Most pipelines that were set up originally as common carriers did not change to Order 500 transportation. They still transport gas under section 311 of the NGPA. Most of these pipelines feed directly into larger interstate pipelines. Many offshore pipelines operate in this manner.

Table 1
Developments Leading to Unbundled Transportation Services by Interstate Natural Gas Pipelines

Event	Date	Description
FPC Order 533	8/75	Permitted transportation of gas bought by high priority (process, commercial, feedstock) users to avoid curtailments.
FERC Order 2	2/78	Extended Order 533.
FERC Order 46	12/78	Authorized transportation by interstate pipelines for intrastate pipelines and vice versa.
FERC Order 27	4/79	Allowed agricultural, schools and hospitals to purchase transportation.
FERC Order 30	5/79	Allowed transportation services to fuel switchable industrial users to reduce oil shortage.
Off System Sales	11/79	Allowed direct pipeline sales to end users not normally served if pipelines could avoid take-or-pay liabilities
Special Marketing Programs (SMPs)	83-85	Variety of producer and pipeline programs aimed at fuel switchable end users. Captive customers were not eligible
FERC Order 319	8/83	Allowed blanket certificates to transport gas to high priority (process, feedstock, commercial, agricultural, schools, and hospitals) end users.
FERC Order 234-B	8/83	Allowed blanket certificates to transport gas to non priority end users eligible for Order 30. Notification needed after not before delivery for all transactions less than 120 days. Essentially created spot market.
SMP's Extension	9/84	Extended current SMP's one more year. Allowed SMP gas to serve 10% of captive customer market.

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Table 1 (continued)

Event	Date	Description
Maryland's People Counsel vs. FERC	5/85	Ruled that SMP's and current blanket transportation certificates discriminatory. In effect outlawed any spot market not opened to all buyers.
FERC Order 436	10/85	Allowed for pipelines to become "open access" transporters of gas on a voluntary basis.
Tenneco vs. FERC	10/85	FERC denied requests to extend current SMP's. Urged pipelines to use Order 436.
Associated Gas vs. FERC	6/87	U.S. court of Appeals remanded Order 436 on the grounds that portions relating to nondiscriminatory access and contract demand conversions aggravated pipelines take-or-pay problems. Left intact open access and rate conditions of Order.
FERC Order 500	8/87	Modified Order 436. Producers must offer credit gas for gas transported to take-or-pay liabilities. Pipelines may recover costs from past liabilities. Pipelines may design future supply charges to prevent additional take-or-pay problems.
FERC Order 490	5/88	Allowed for the abandonment of purchase contracts where the contract has either expired or been terminated under mutual agreement of all parties. Encouraged open access by making Order 436/500 certificates prerequisites to abandon purchases unilaterally.

Source: Energy Information Administration. 1989. Growth in Unbundled Natural Gas Transportation Services: 1982-1987. Washington, D.C.: GPO. p.8.

All pipelines have the option of transporting gas under individual certificates covered by section 7(c) of the Natural Gas Act (EIA 1989).

Major pipelines continue to purchase and resell gas, but the volume and percentage of throughput are declining. The amount of transportation gas on a given Order 500 carrier is mainly determined by the amount of contract demand/firm transportation conversion. The amount of conversion is determined by customers, not the pipeline. The remaining capacity is allocated on a first-come first-served basis.

Rates charged by interstate pipelines vary between companies. Pipelines design their own tariff schedules but are subject to FERC approval. When authorizing rates, FERC takes into consideration capital costs and anticipated throughput. Generally, tariffs are designed to recover acquisitions costs of capital plus a fair rate of return.

Different rates are charged depending on the class of customer and type of service. The two major services of pipelines are resale sales and carriage services. Rates also vary depending on whether the service is firm or interruptible. Firm service includes certain guarantees of delivery. Firm customers have specified rights to pipeline capacity. Interruptible customers do not have guarantees for delivery. Gas is delivered on a "best efforts" basis only when excess capacity is available.

Rates can be designed in two ways: a fixed demand charge or a variable commodity charge. Demand charges are based on the maximum quantity of gas the customer can request per day. Commodity charges vary depending on the actual quantity of gas delivered. Use of demand charges guarantees the pipeline will recover its costs fully. Commodity charges may recover more or less costs depending on the difference between actual and anticipated throughput.

In reality, rates are a combination of the two. Demand charges are based on the amount and priority of rights on pipeline capacity. Interruptible customers often have no demand charge since they have no capacity rights. The FERC can encourage or discourage natural gas consumption by authorizing the mix between commodity and demand charges. With higher commodity charges, marginal costs of gas are higher and less gas is consumed. More costs are shared between firm and interruptible customers. A higher proportion of demand charges encourages consumption because of lower marginal costs.

The minimum rate that can legally be charged to any customer is the average variable cost of moving the gas. This insures that one customer class is not subsidizing another.

Pipelines still have great flexibility to price discriminate because pipelines have some discretion in allocating their large fixed costs. Any selective discounting must show justification to avoid legal challenges (EIA 1989).

More recent gas industry developments include the passage of the Natural Gas Decontrol Act of 1989. The act removes all existing natural gas price controls by 1993 (John S. Herold 1989a). This should have little or no effect on prices since most gas is sold well below federal price ceilings (John S. Herold 1989b). Although there are still wells shut in, there is no economic gas surplus. Markets seemed to have cleared because of large volumes traded on the spot market and lack of binding federal price ceilings. Natural gas futures began trading at the New York Mercantile Exchange in early 1990. This creates possible price discovery mechanisms for contracts and opportunities for hedging strategies (Schneier 1990).

The major distinction between resale and transportation gas is who bears the risk to guarantee supplies. Pipeline gas is often bought during times of peak demand. In these cases, pipelines can insure supplies by drawing gas out of storage near consuming areas. If customers own or lease their own storage, they can purchase the lowest priced gas during off peak periods and draw on their own supplies during high peak times. This difference is less important during summer months of low demand. If natural gas prices rise or become uncertain, resale gas may become more attractive.

Currently transportation gas dominates the market. In 1988 it accounted for 71% of gas throughput for major interstate pipelines. Open access allows customers to choose from several suppliers. Producers now have more options than just selling to the nearest pipeline.

Resale gas is still bought by customers without the knowledge or sophistication to seek supplies directly from producers. These consumers would rather have the pipeline employ resources to obtain and aggregate sufficient supplies.

Most commonly, pipeline customers obtain a mix of transportation and resale gas. Transportation gas can be further diversified by buying from several producers and marketers. Resale gas can be diversified only if the customer is physically connected to more than one pipeline. The mix depends on the demand fluctuations of the customer, amount of customer-owned storage, and the customer risk profile. State utility commissions heavily influence local distribution supply decisions.

Chapter 3
METHODOLOGY

The majority of data used in this analysis are taken from Statistics of Interstate Natural Gas Pipeline Companies compiled by the Energy Information Administration (EIA). The EIA report annually summarizes financial and operating data contained in individual company's FERC Form 2s. Form 2s must be filed by all major interstate natural gas pipelines in compliance with Federal Power Commission (FPC) Order No. 63.

The data are taken from industry-wide composite statements. Composite financial and operating statements are the summations of all accounts as reported by the individual companies to the FERC. Data presented is not consolidated and thus includes intercompany transfers. Gas transported between two pipelines is counted twice.

Composite statements contain only data from major pipeline companies. Nonmajor companies are not required to file FERC form 2s and are therefore excluded from the evaluation. A major natural gas pipeline company is defined as any company whose combined gas sold for resale and gas transported or stored for a fee exceeded 50 billion cubic feet in each of the three previous calender years. Even though the list of major pipelines can change as companies merge or when companies are reclassified, proportional numbers such as revenues per mcf gas sold, revenues per mcf gas transported, or net income per dollar of sales are exact industry averages for major interstate pipelines.

Evaluation of carriage contracts is achieved by allocating the gas utility accounts. Pipeline financial data reported to the FERC is already classified into gas utility and non-gas utility components. All assets, revenues, and expenses in this thesis are further separated based on whether they relate to company-owned or customer-owned gas. Then profit margins and rates of return on assets are calculated separately for carriage services and gas sales. Calculations are done on a before-tax basis ignoring interest.

Division of common costs and assets is based on physical units of gas. The attempt is made to match assets and expenses to revenues. Since revenues are based on deliveries, allocation is determined by the volume of gas delivered, not on gas received.

Dollar amounts are used only to allocate certain current assets. Higher proportions of current assets are needed for resale transactions because the value of the commodity is included. The proportional use between transport and resale of an account such as accounts receivables should be in proportion to the dollar value of the goods and services, not the amount of gas delivered. Percentage of sale revenue is always substantially higher for resale operations even when transportation volumes exceed sales (figure 3).

Throughout the analysis, resale and transportation gas are treated as coproducts. Each are allocated fixed and common costs based on gas deliveries. Transportation volumes surpassed resale volumes only in 1986. If deliveries of pipeline gas by others is included, transportation volumes surpassed resale volumes in 1987 (see appendix B). Different cost allocation schemes must be used if transportation gas is designated a byproduct. This designation would not be valid in recent years.

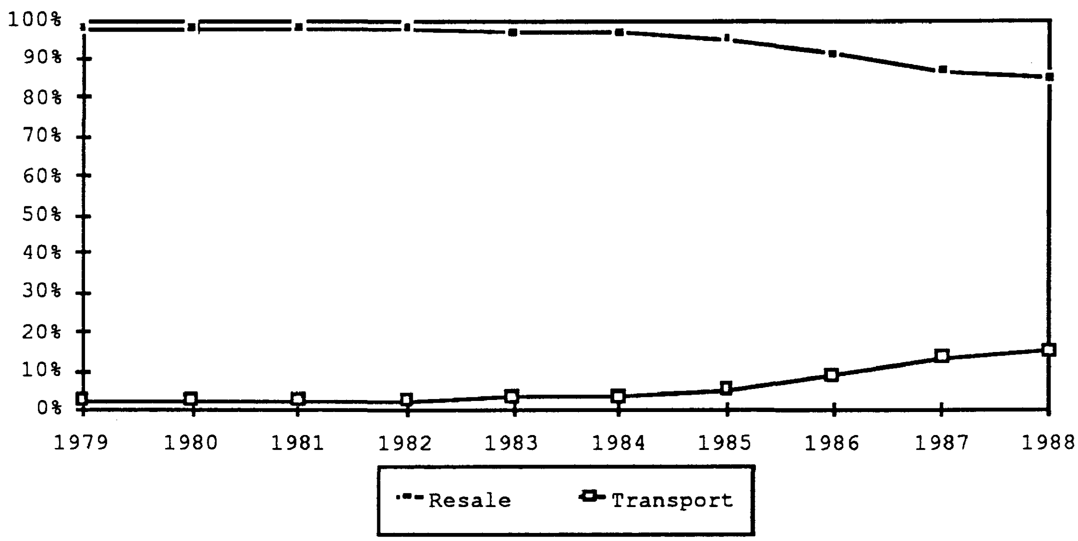


Figure 3. Major Interstate Natural Gas Pipelines: Percentage of Operating Revenues, 1979-1988

Source: Graph based on data in EIA. Statistics of Interstate Natural Gas Pipeline Companies 1988. Washington, D.C.: GPO.

All assets are recorded at historical cost. No attempt is made to modify the accounts for inflation. This will bias results relating to rates of return and to profit trends. An attempt to modify each capital investment to constant dollars is beyond the scope of this evaluation. Consequently, it is assummed that all pipeline assets are equally affected by inflation. For simplicity, only the asset side of the balance sheet is split between resale and transportation. It is assumed by definition, that the equity and liability side would balance if a similar division could be justified.

Pipeline storage facilities are used to store both pipeline and third-party-owned gas. However, data determining the percentage split is not available. Pipeline-owned storage near end-use markets ensures peak demand supply. This is a major justification for premiums paid for resale gas. Since storage is a separate service from transportation and a division between resale and transportation is hard to justify without adequate information, all storage accounts are assigned to resale. This includes payments for storing gas owned by others. Evaluation of carriage contracts should not be affected.

Detailed account-by-account allocations of all statements are found in Appendixes A through D. Ratios used in account allocations are summarized in Table 2.

Table 2
Criteria Used in the Division of Natural Gas Utility Accounts

Ratio	Based on	Description
Transport	-	The account relates only to carriage contracts. 100% allocated to transportation services.
Resale		The account relates to only pipeline owned gas. 100% allocated to resale operations.
Throughput	Volume of Gas	Percentage division of account is based on the volume of pipeline-owned and nonpipeline-owned gas that is delivered by the pipeline.
Deliveries	Volume of Gas	Percentage division of account is based on the total volume of pipeline-owned and nonpipeline-owned gas that is delivered. Includes pipeline volumes delivered by others for a fee.
Asset	Acquisition Value in Dollars	Percentage division of account is based on the historical value of capital plant utility assets used. Asset use is determined by gas throughput and deliveries.
New Assets	Acquisition Value in Dollars	Percentage division of account is based on the acquisition value of capital plant utility assets used. Same allocation method used as Asset ratio.
Sale $	Dollars	Percentage division based on sale revenue.
Expenses	Dollars	Percentage division based on operating expenses.

Chapter 4

CONCLUSIONS

Carriage services are an important feature of the interstate natural gas market. The extent to which a pipeline remains a merchant of gas rather then only a provider of transportation is an important business decision. Results derived from account allocations support the two main hypothesis: Carriage contracts have lower profit margins (table 3, figure 4) and rates of return (figure 5) compared with pipeline gas sales. Transportation volumes share of throughput has increased.

In the ten years after the passage of the NGPA, carriage-only services reported negative or zero profits for all years before 1985 except one. In all years after FERC's 1985 open access initiative, transportation services reported positive profits. Nonetheless, the return an assets from gas sales has always been 3 to 4 times greater.

Before Special Marketing Programs began in 1983, the average interstate pipeline delivered the same volume of transportation gas as it paid others to deliver their own gas. The difference between volumes is less than 3% of throughput (figure 6). This suggests that a large portion of carriage contracts before 1983 were interstate pipelines

Table 3
Return on Assets and Profit per Mcf Gas Delivered
for Major Interstate Natural Gas Pipelines, 1979-1988

Return on Assets

Percent	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Carriage	-3.8	-5.9	-7.2	-5.9	2.8	-.3	-.4	3.2	3.0	2.1
Sales	13.5	13.6	13.1	12.5	13.2	15.3	12.9	13.4	10.0	6.3
Utility	12.3	12.3	11.3	10.8	12.1	13.2	10.6	10.7	7.8	4.8

Profits per Mcf Delivered

Dollars / Mcf	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Carriage	-.02	-.03.	-.04	-.05	.03	.00	.00	.03	.03	.02
Sales	.15	.15	.16	.20	.27	.28	.25	.30	.25	.15
Utility	.12	.13	.12	.15	.21	.21	.17	.18	.12	.07

Note: Data taken from Appendix D, Table D-2

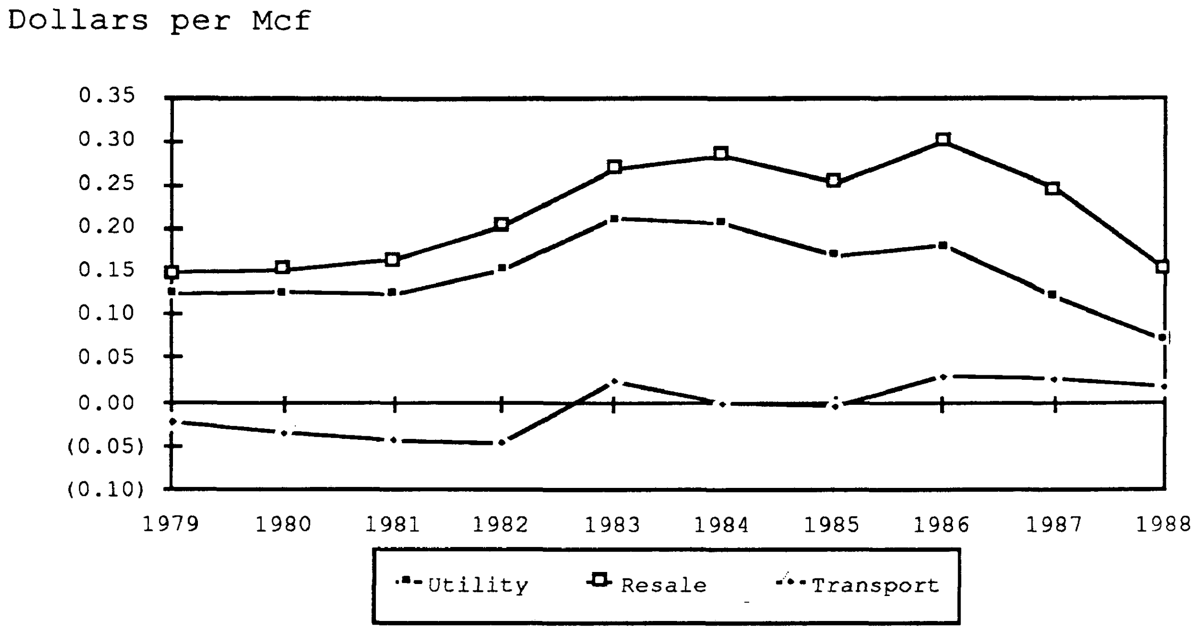


Figure 4. Major Interstate Natural Gas Pipelines: Profit per Mcf Delivered, 1979-1988

Source: Graph based on data in EIA. Statistics of Interstate Natural Gas Pipeline Companies 1988. Washington, D.C.: GPO.

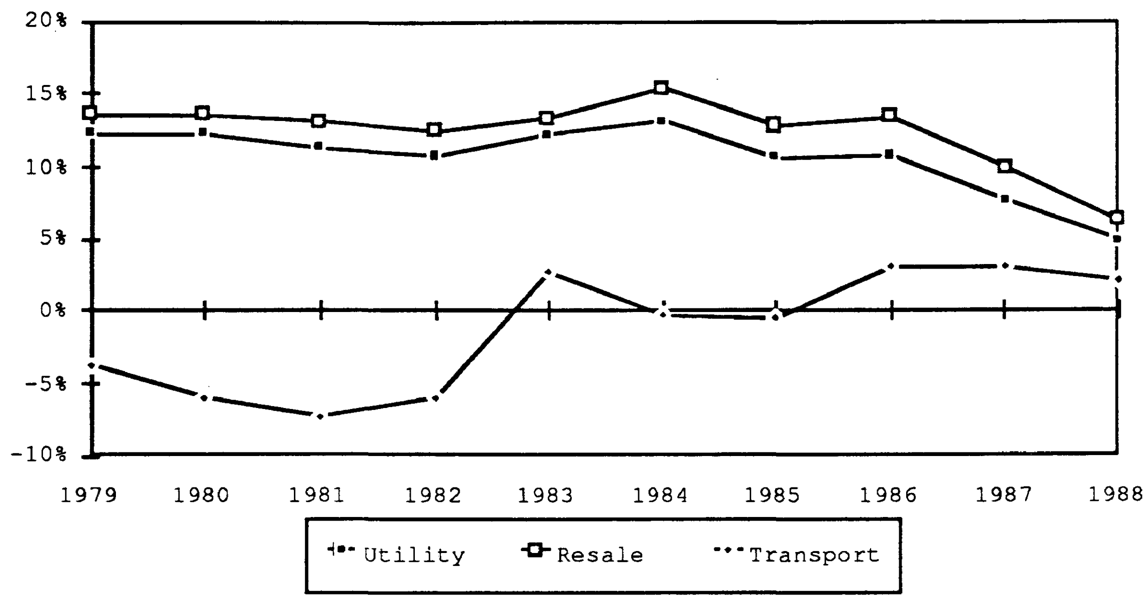
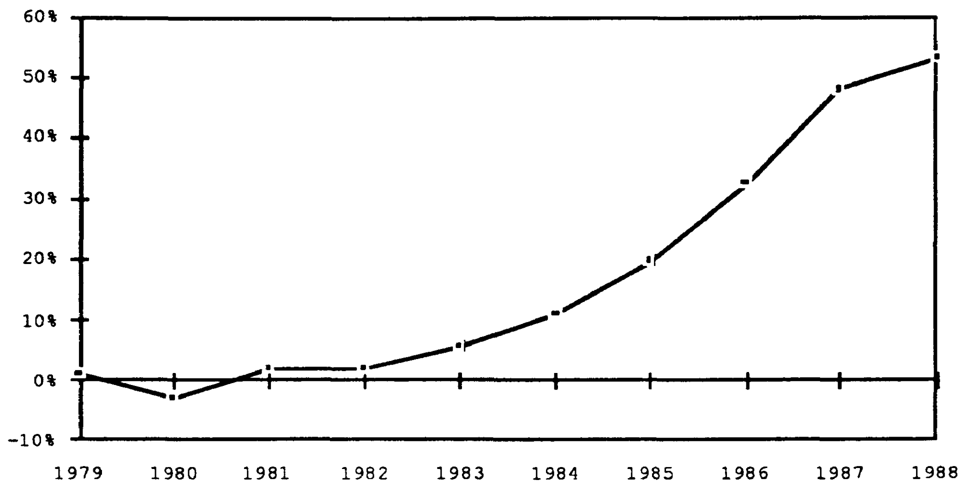


Figure 5. Major Interstate Natural Gas Pipelines: Return on Assets, 1979-1988

Source: Graph based on data in EIA. Statistics of Interstate Natural Gas Pipeline Companies 1988. Washington, D.C.: GPO.



Proxy = (Volume Gas Transported for Others) - (Volume of Respondents Gas Transported by Others) * 100%
Volume of Total Throughput

Figure 6. Proxy for Nonpipeline Deliveries as Percentage of Throughput, 1979-1988

Source: Graph based on data in EIA. Statistics of Interstate Natural Gas Pipeline Companies 1988. Washington, D.C.: GPO.

transporting gas for other interstate pipelines. If tariffs were comparable between pipelines, prices and profitability of the service were irrelevant. Money received would equal money paid.

After 1983 all nonpipeline transportation gas rose. Carriage for other pipelines declined (figure 7). Both profit margin per mcf and return on assets show sharp breaks upward in 1983. Pipeline carriage rates must have changed in response to larger volumes of customer owned gas being transported.

Lower profits for transportation services can be partly

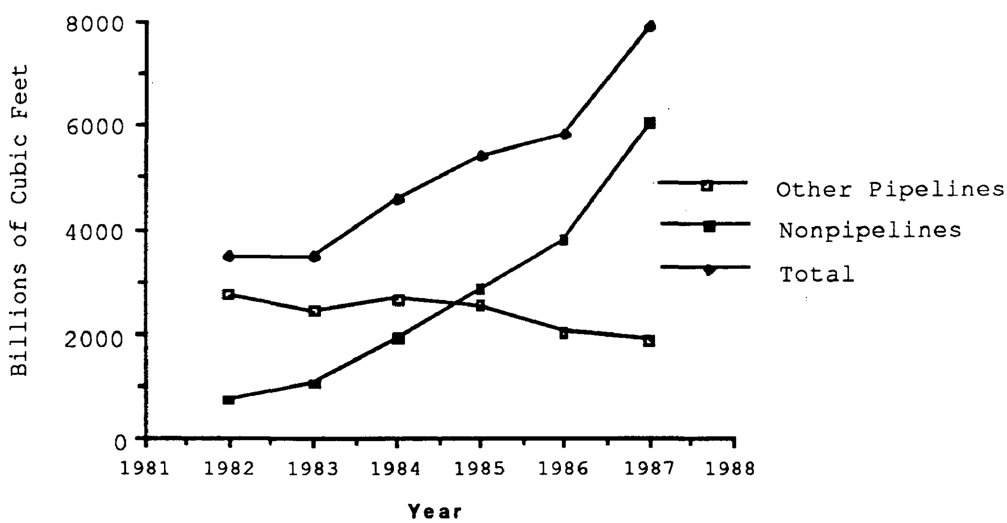


Figure 7. Transportation Volumes by Customer Type for 20 Major Pipeline Companies, 1982-1987

Source: Graph based on data in EIA. Growth in Unbundled Natural Gas Transportation Services: 1982-1987. Washington, D.C.: GPO.

attributable to fewer services being provided by the pipelines. With carriage contracts pipelines do not obtain contracts with producers, aggregate supplies, provide storage or guarantee gas for peak demand. In addition, a large portion of the spot market is transported via carriage contracts. When the gas is transported on an interruptible or "best efforts" basis, pipelines do not guarantee pipeline capacity (EIA 1989).

A transportation only contract contains less risk to pipelines. Fewer pipeline resources are required to move the same amount of gas to the customer. Working capital is not needed to purchase gas within the pipeline system. Both pipeline supply risk, the risk of being unable to obtain supplies for contracted demand, and demand risk, the risk of being unable to sell contracted supplies, are removed. These risks are transferred to the producer and consumer. When pipelines were the sole supplier of gas, price risk was passed on to the consumer through regulated cost-based pricing. With competition, pipelines now face the risk of having to sell resale gas at lower than anticipated prices (Legato 1987).

From 1979 to 1988 gross profits (revenues in excess of variable costs) were positive for both transportation services and resale operations (figure 8). Therefore gas

Dollars per Mcf

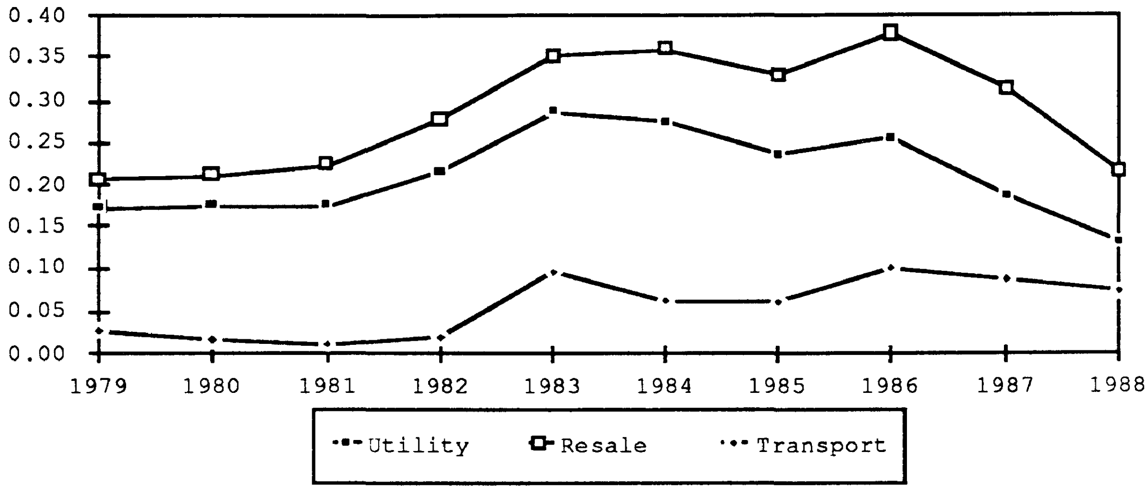


Figure 8. Major Interstate Pipeline Companies: Revenues in Excess of Variable Costs, 1979-1988

Source: Graph based on data in EIA. Statistics of Interstate Natural Gas Pipeline Companies 1988. Washington, D.C.: GPO.

transported was above the minimum legal rate. Excess revenues from transportation services were always available to recover some of the fixed costs and contribute to utility profits. Any arguments for one customer class subsidizing another must focus on the allocation of fixed costs. Resale customers may be more willing and able to bear a higher proportion of the fixed costs for the additional services.

Lower carriage profits could be a result of the political process of approving rate schedules. Although profit margin per mcf for resale gas is much higher than transportation gas, this is not the case when considering profit margins per dollar of sales (figure 9). After open

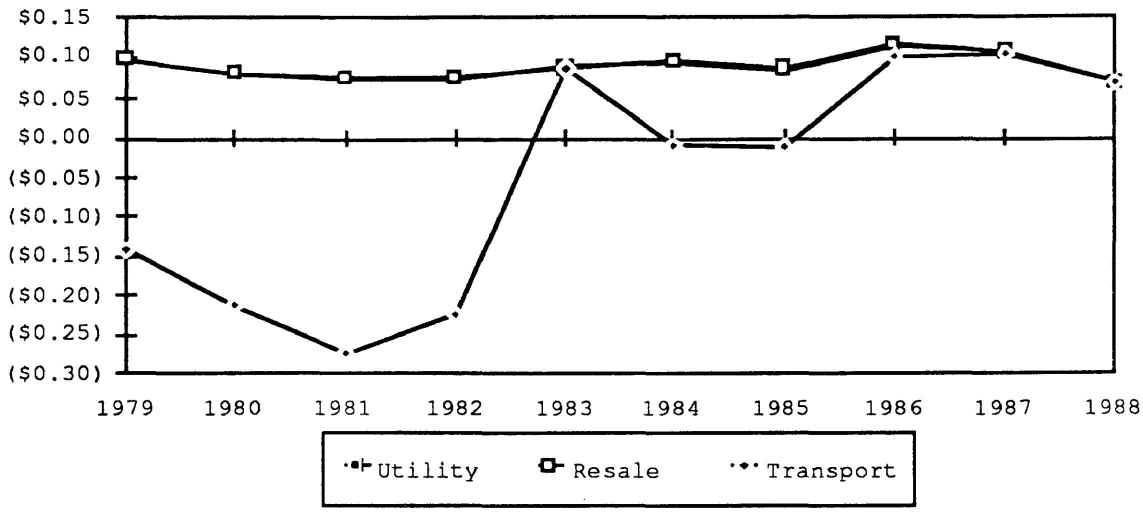


Figure 9. Major Interstate Natural Gas Pipelines: Profit per Dollar of Sales, 1979-1988

Source: Graph based on data in EIA. Statistics of Interstate Natural Gas Pipeline Companies 1988. Washington, D.C.: GPO.

access, profit margins per dollar are identical. A 15¢/mcf profit on a $2.20 gas sale may appear more "acceptable" than a similar profit on a 25¢ carriage contract (1988 data) even when the major difference is that pipelines take temporary title to the commodity. By keeping profits as a percentage of sales constant, rates may face less legal challenges.

With the advent of open access, pipelines lost monopsony/monopoly power. Producers now can sell to more than one buyer. Customers can choose between more than one supplier. After 1986 profit margins and returns of investment for resale and transportation tend to converge. Resale return on assets were 4 times greater than transportation services in

1986 and only 3 times greater in 1988. This could indicate eroding of pipeline market power as customers become more knowledgeable and have the ability to obtain gas from different suppliers. When providing carriage only, pipelines do not profit at all from any remaining market power. The fact that gas sales profits were not compensated by increases in carriage profits supports that much of the monopsonistic/ monopolistic power was protected by regulation.

Carriage volumes have increased from 22% of throughput in 1979 to 71% in 1988 (figure 10). Early growth of transportation volumes can be attributed to pipelines seeking credit for take-or-pay liabilities. As take-or-pay contracts were renegotiated and paid off, the added "hidden" value of transportation gas declined. There is now less incentive for pipelines to transport gas owned by others.

Much of the recent increases of transportation throughput are due to customer supply choices. Since pipeline profits per mcf are lower for carriage services, producers and consumers can capture benefits by bypassing the pipeline's merchant role. As the market became freer with open access, customers sought the lowest priced supplies, often in the spot market. The added services and guarantees of supply for pipeline resale gas could not justify the price

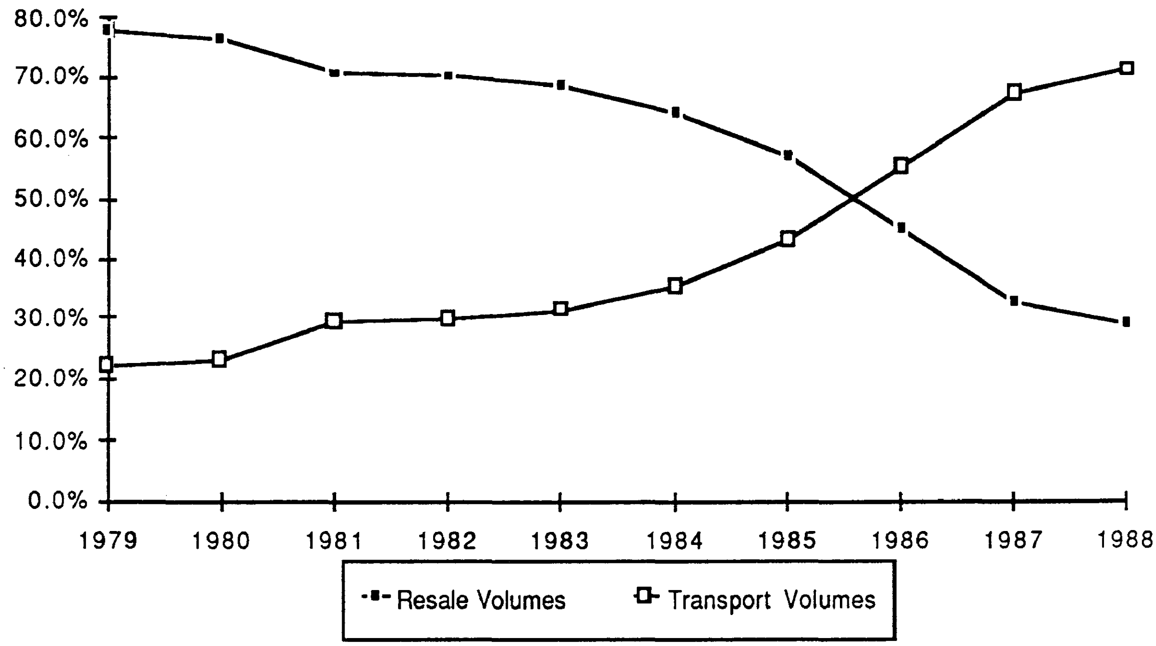


Figure 10. Major Interstate Natural Gas Pipelines: Resale and Transportation Gas Volumes as a Percentage of Throughput, 1979-1988

Source: Graph based on data in EIA. Statistics of Interstate Natural Gas Pipeline Companies 1988. Washington, D.C.: GPO.

differentials. This trend could change if gas supplies tighten and prices become uncertain in the future.

Chapter 5

SUGGESTIONS FOR FURTHER RESEARCH

There are many additional areas of interest relating to pipeline carriage services that can be considered or expanded upon. Any participant in the natural gas industry should take into account all of the following topics.

Taxation

All profit and return calculations in this evaluation have been on a before-tax basis. Income tax must be taken into account to determine absolute benefits to any pipeline. Since both carriage services and gas sales generate income to the same companies, taxes will affect both services equally. The conclusions of this evaluation will not change even though specific values calculated will.

Risk and Leverage

When pipeline operators act as merchants they take on added risk. This will affect the cost of acquiring new debt and the value of company stock. The objective of any company is to increase the wealth of its shareholders. All calculations in this evaluation were for return on assets, not return on equity. If pipelines engage in lower risk carriage services they may achieve large returns on equity by being highly leveraged. The exact relationships among risk, leverage, and return on equity should be examined before making any business decisions concerning carriage.

Given a pipeline company's risk preferences and local market conditions, it may be possible to estimate optimal mixes of resale and transportation gas.

Economic Analysis

Profits quoted in this study are accounting profits, not economic profits. Opportunity costs are not explicitly calculated. Although viable options with natural gas pipelines are very limited due to large sunk costs and and the specific use of the equipment, there is one important opportunity benefit with carriage that was not taken into account. The take-or-pay credits pipelines received for transporting producer gas was not incorporated into the profit calculations. This would be more of a historical interest since most take-or-pay disputes have been settled.

Detailed Account Allocations

Some accounts in this evaluation are the summation of many different sources. A good example would be accumulated depreciation, depletion and amortization. Without detailed information, many multisource accounts were allocated between resale and transportation with only one ratio. Much more detailed data can be obtained from individual company FERC Form 2s. All Form 2s are a matter of public record.

Regional Markets

Local conditions have large effects on natural gas markets. Natural gas transportation is limited. Pipelines are the exclusive means of transport in the United States. There are long lead times for construction of new facilities. Therefore local markets may take time to react to changes in demand or supply. Production locations are determined by geology, not demand. The distances between supply and consumption must be considered. Local markets must be studied before making any conclusions or decisions about any one pipeline.

Customer Classes

Rates charged to different customer classes should be examined more closely. Some customer groups can switch to alternative fuels immediately. Others may be able to do so with time. Yet others are captive or unable to switch. All classes can conserve or reduce consumption to some extent. By examining customer class demand elasticities, rates can be designed to allocate fixed costs to those customers willing and able to bear them. To maintain maximum capacity utilization, customer class differences must be studied.

Quality of Services

There are different qualities of service besides the designation of resale and transportation that pipelines perform. Most notably is the hierarchy of rights to pipeline capacity. There are many gradations of firm and interruptible service. Customer preferences regarding capacity guarantees vs. price should be examined.

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GLOSSARY

Alternative Fuel Capacity: The on-site availability to burn fuels other than natural gas.

Best Efforts: A contractual agreement in which the seller (or transporter) agrees to supply or deliver natural gas on an "as available" basis and is not held responsible for disruption of service. Also see interruptible gas.

Blanket Certificate: Permission granted by the Federal Energy Regulatory Commission (FERC) for a recipient to engage in an activity (such as transportation services) within certain specified conditions without case-by-case approvals.

Burner-Tip: Generic term meaning ultimate point of consumption.

Bypass: The construction of a physical connection between a large end user and a supplier. Often used by large industrials to obtain direct pipeline gas without going through a local distribution company.

Captive or Core Customer: A natural gas user who cannot readily leave or switch a system supplier. Usually applies to residential and small commercial markets. Can apply in certain circumstances to large industrial and electric utilities.

Carriage: The transportation of natural gas as a separate service for a fee. Gas is not owned by the pipeline.

Commodity Charge: That portion or rate based on the volume of gas delivered.

Common Carrier: A transporter that is obligated by law to accept products for transmission without discrimination among shippers.

Contract Conversion: Under FERC Order 500, pipeline sales customers have the option of converting their purchase volumes to firm transportation over a five-year term.

Contract Demand: A service contract for resale or CD gas. Specifies the pipeline's supply obligation to a local distribution company. Used to guarantee supplies during peak demand. The gas charge has two parts: the commodity charge based on the volume of gas taken and the demand charge based the customers demand characteristics. Often the minimum bill for this type of contract is the entire demand charge plus a percentage of the contracted volume whether or not the full percentage is taken.

Cost Allocation: Term used to signify a procedure which common or joint costs are apportioned among customers.

Curtailment: Reduction of deliveries of natural gas.

Demand Charge: Fixed charge or rate for gas service based on a customers demand characteristics. Often used to guarantee supply during peak demand.

Exchange Gas: Gas that is received from another party in exchange for gas delivered to the same party. Deliveries and receipts may be at different locations and times.

Federal Energy Regulatory Commission (FERC): A five member board within the Department of Energy. Created in 1977 replacing the Federal Power Commission. Among its responsibilities is the federal regulation of the natural gas industry.

Federal Power Commission: Federal agency which was predecessor to the FERC. Charged with the administration of the Natural Gas Act of 1938 regulating the transportation and sale of natural gas in interstate commerce.

Firm Service: Service offered to customers under contracts which anticipate no interruptions or curtailments. Service can be sales or transportation.

Fuel-Switching Capability: The ability of a consumer to change readily the type of fuel consumed whenever a price or supply advantage develops for an alternative fuel.

Interruptible Service: A transport or sale agreement which may be curtailed if firm customers need system capacity. A fixed or demand charge is usually not included.

Interstate Market: Natural gas sold to a pipeline subject to federal controls (any pipeline engaged in the transportation of natural gas across state boundaries)

Intrastate Market: Natural gas produced and consumed within the same state and not transported by an interstate pipeline.

LDC: Local Distribution Company. Sometimes referred to as a public gas utility.

Main Line Sales: Sales to end users direct from pipelines. Often possible through construction bypassing the local distribution company.

Marketer: An individual or company engaged in bringing together sellers and buyers of gas. Very important in the spot market. Marketers may buy gas and arrange transportation for their own sales.

Natural Gas: Gaseous hydrocarbons consisting of mainly methane (CH4) but may contain small amounts of heavier compounds. Originating in underground structures.

New Gas: General reference to gas in that was decontrolled immediately or in steps after the passage of the Natural Gas Policy Act of 1978. Usually referred to high cost gas and gas dedicated to interstate commerce after 1978.

Off-System Supplies: Supplies purchased from other than the delivering pipeline. Transportation Gas.

Old Gas: General reference to all gas in categories in the Natural Gas Policy Act of 1978 that price controls were to remain in effect indefinitely. Old gas price ceilings only raised to reflect inflation. Recent legislatures removes price controls of all gas by 1993.

Price Ceiling: Statutory maximum lawful prices for various categories of natural gas.

Resale Gas: Gas owned by the transmitting pipeline. Gas bought to be resold.

Sales for Resale: Sales to other pipelines and local distribution companies that are to be resold not consumed.

Spot Market: Excess deliverability of gas available for purchase and sale on a short term basis. Contracts are usually 30-90 bays. Deliverability is on a best efforts basis.

System Supply: Gas purchased from transmitting pipeline. Resale gas.

Take-or-Pay: The amount of gas required to be purchased whether or not deliveries are physically taken.

Transportation Gas: Gas not owned by the transmitting pipeline. Carriage Gas.

WACOG (Weighted Average Cost of Gas): Total cost of gas divided by throughput. Served as a basis to calculate resale tariffs and schedules.

Wellhead Price: The price received by the gas producer for sales at the well.

Appendix A

Determination of Revenues

Gas utility operating revenues for all major interstate natural gas pipelines are shown in table A-1. Revenues are further divided based on whether they relate to resale or transportation operations. All revenues from natural gas sales are assigned to the resale operations. All revenues received for the transportation of gas of others is assigned to transportation. Other utility revenues include sales of products extracted from natural gas, revenues from incidental gasoline and oil shale, intracompany transfers, revenues from manufactured gas, revenues from natural gas processed by others (royalty payments on company owned leases), and other natural gas revenues. All relate to natural gas owned by the pipeline and therefore are allocated to resale operations.

Table A-1
Composite Gas Utility Operating Revenues
for Major Interstate Pipelines, 1979-1988

Example Allocation
(millions of dollars)

	Allocated to/by	1988 Utility	1988 Resale	1988 Transport
Sales to Ultimate Consumers	Resale	3,092.3	3,092.3	-
Sales for Resale	Resale	19,419.8	19,419.8	-
Total Natural Gas Sales		22,512.1	22,512.1	-
Intracomapany Transfers	Resale	103.6	103.6	-
Revenues from Transportation	Transport	4,059.4	-	4,059.4
Sales of Products Extracted from Natural Gas	Resale	228.8	228.8	-
Revenues from Gas Processed by Others	Resale	90.8	90.8	-
Revenues from Incedental Gasoline and Oil	Resale	22.9	22.9	-
Other Natural Gas Revenues	Resale	482.9	482.9	-
Revenues from Manufactured Gas	Resale	-	-	-
Total Natural Gas Operating Revenues		27,500.6	23,441.2	4,059.4
SALE $ RATIO **Percent of Revenues for Transport and Resale**		100.0%	85.2%	14.8%

- No Entry

Data taken from EIA. 1988. Statistics of Natural Gas Pipeline Companies 1988. DOE/EIA-0145(88). Washigton D.C.: GPO

Table A-1
Composite Gas Utility Operating Revenues
for Major Interstate Pipelines, 1979-1988

Transportation Services
(millions of dollars)

Year	1979	1980	1981	1982	1983
Revenues					
Sales to Ultimate Consumers	-	-	-	-	-
Sales for Resale	-	-	-	-	-
Total Natural Gas Sales	-	-	-	-	-
Intracomapany Transfers	-	-	-	-	-
Revenues from Transportation	643.5	744.0	1,010.9	1,258.7	1,786.7
Sales Products Extracted from Natural Gas	-	-	-	-	-
Revenues from Gas Processed by Others	-	-	-	-	-
Revenues from Incedental Gasoline and Oil	-	-	-	-	-
Other Natural Gas Revenues	-	-	-	-	-
Revenues from Manufactured Gas	-	-	-	-	-
Total Natural Gas Operating Revenues	643.5	744.0	1,010.9	1,258.7	1,786.7
SALE $ RATIO	2.2%	1.9%	2.2%	2.2%	3.1%
Percent of Revenues for Transport or Resale					

\- No Entry

Table A-1
Composite Gas Utility Operating Revenues
for Major Interstate Pipelines, 1979-1988

Transportation Services (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Revenues					
Sales to Ultimate Consumers	-	-	-	-	-
Sales for Resale	-	-	-	-	-
Total Natural Gas Sales	-	-	-	-	-
Intracomapany Transfers	-	-	-	-	-
Revenues from Transportation	1,922.6	2,271.9	3,026.6	3,621.5	4,059.4
Sales Products Extracted from Natural Gas	-	-	-	-	-
Revenues from Gas Processed by Others	-	-	-	-	-
Revenues from Incedental Gasoline and Oil	-	-	-	-	-
Other Natural Gas Revenues	-	-	-	-	-
Revenues from Manufactured Gas	-	-	-	-	-
Total Natural Gas Operating Revenues	1,922.6	2,271.9	3,026.6	3,621.5	4,059.4
SALE $ RATIO	3.4%	4.6%	8.9%	13.1%	14.8%
Percent of Revenues for Transport or Resale					

- No Entry

Table A-1
Composite Gas Utility´Operating Revenues
for Major Interstate Pipelines, 1979-1988

Resale Operations
(millions of dollars)

Year	1979	1980	1981	1982	1983
Sales to Ultimate Consumers	2,132.7	2,852.0	3,599.3	5,834.2	6,049.2
Sales for Resale	25,930.8	33,679.1	40,677.5	47,766.8	47,660.7
Total Natural Gas Sales	28,063.5	36,531.1	44,276.8	53,601.0	53,709.9
Intracomapany Transfers	-	-	-	-	-
Revenues from Transportation	-	-	-	-	-
Sales Products Extracted from Natural Gas	274.0	529.7	606.5	558.5	527.4
Revenues from Gas Processed by Others	101.4	158.2	195.9	212.4	197.9
Revenues from Incedental Gasoline and Oil	32.8	51.8	100.9	98.8	84.0
Other Natural Gas Revenues	243.5	249.7	274.0	481.0	451.2
Revenues from Manufactured Gas	-	-	-	-	35.2
Total Natural Gas Operating Revenues	28,715.2	37,520.4	45,454.1	54,944.8	55,005.7
SALE $ RATIO	97.8%	98.1%	97.8%	97.8%	96.9%
Percent of Revenues for Transport or Resale					

\- No Entry

Table A-1
Composite Gas Utility Operating Revenues
for Major Interstate Pipelines, 1979-1988

Resale Operations (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Sales to Ultimate Consumers	7,260.9	6,450.7	3,095.2	2,591.6	3,092.3
Sales for Resale	45,268.5	38,545.3	26,412.5	20,350.7	19,419.8
Total Natural Gas Sales	52,529.4	44,996.0	29,507.7	22,942.3	22,512.1
Intracomapany Transfers	526.3	576.1	316.8	116.8	103.6
Revenues from Transportation	-	-	-	-	-
Sales Products Extracted from Natural Gas	535.4	490.3	260.9	280.6	228.8
Revenues from Gas Processed by Others	238.6	210.9	165.1	118.7	90.8
Revenues from Incedental Gasoline and Oil	83.8	66.4	33.0	20.0	22.9
Other Natural Gas Revenues	490.3	494.1	548.9	457.7	482.9
Revenues from Manufactured Gas	-	-	-	7.9	-
Total Natural Gas Operating Revenues	54,403.8	46,833.9	30,832.4	23,943.9	23,441.2
SALE $ RATIO	96.6%	95.4%	91.1%	86.9%	85.2%
Percent of Revenues for Transport or Resale					

\- No Entry

Table A-1
Composite Gas Utility Operating Revenues
for Major Interstate Pipelines, 1979-1988

Total Utility
(millions of dollars)

Year	1979	1980	1981	1982	1983
Sales to Ultimate Consumers	2,132.7	2,852.0	3,599.3	5,834.2	6,049.2
Sales for Resale	25,930.8	33,679.1	40,677.5	47,766.8	47,660.7
Total Natural Gas Sales	28,063.5	36,531.1	44,276.8	53,601.0	53,709.9
Intracomapany Transfers	-	-	-	-	-
Revenues from Transportation	643.5	744.0	1,010.9	1,258.7	1,786.7
Sales of Products Extracted from Natural Gas	274.0	529.7	606.5	558.5	527.4
Revenues from Gas Processed by Others	101.4	158.2	195.9	212.4	197.9
Revenues from Incedental Gasoline and Oil	32.8	51.8	100.9	98.8	84.0
Other Natural Gas Revenues	243.5	249.7	274.0	481.0	451.2
Revenues from Manufactured Gas	-	0.8	-	(7.0)	35.2
Total Natural Gas Operating Revenues	29,359	38,265	46,465	56,203	56,792
SALE $ RATIO Percent of Revenues for Transport and Resale	100.0%	100.0%	100.0%	100.0%	100.0%

\- No Entry

Table A-1
Composite Gas Utility Operating Revenues
for Major Interstate Pipelines, 1979-1988

Total Utility (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Sales to Ultimate Consumers	7,260.9	6,450.7	3,095.2	2,591.6	3,092.3
Sales for Resale	45,268.5	38,545.3	26,412.5	20,350.7	19,419.8
Total Natural Gas Sales	52,529.4	44,996.0	29,507.7	22,942.3	22,512.1
Intracomapany Transfers	526.3	576.1	316.8	116.8	103.6
Revenues from Transportation	1,922.6	2,271.9	3,026.6	3,621.5	4,059.4
Sales of Products Extracted from Natural Gas	535.4	490.3	260.9	280.6	228.8
Revenues from Gas Processed by Others	238.6	210.9	165.1	118.7	90.8
Revenues from Incedental Gasoline and Oil	83.8	66.4	33.0	20.0	22.9
Other Natural Gas Revenues	490.3	494.1	548.9	457.7	482.9
Revenues from Manufactured Gas	-	-	-	7.9	-
Total Natural Gas Operating Revenues	56,326	49,106	33,859	27,565	27,501
SALE $ RATIO	100.0%	100.0%	100.0%	100.0%	100.0%
Percent of Revenues for Transport and Resale					

- No Entry

Appendix B

Determination of Expenses

Gas utility operation and maintenance expenses for all major interstate natural gas pipelines are shown in table B-1. Expenses are separated into production, storage, transmission, distribution and administration expenses. All storage and production expenses are allocated to resale. Production expenses include purchased gas.

Common transmission and distribution expense accounts are allocated based on throughput except transmission of gas by others. This account refers to respondent-owned gas transported by other pipelines or LDCs and is solely allocated to resale operations. The division assumes expenses are the same per mcf gas delivered regardless of ownership. Table B-2 lists volumes and percentages of the gas accounts for 1979-1988. Gas delivered for operational purposes such as exchange gas, gas consumed by the pipeline, gas delivered to storage, and other unclassified deliveries is excluded when determining percentage divisions.

General and administrative expenses is based on total customer deliveries. This includes the portion of pipeline owned gas that is delivered by others. The division assumes that the same amount of expense occurs to monitor deliveries regardless of who transports the natural gas.

Table B-1
Composite Gas Utility Operating Expenses
for Major Interstate Pipelines, 1979-1988

Example Allocation
(millions of dollars)

Year	Allocated to/by	1988 Utility	1988 Resale	1988 Transport
Transmission Expense	Throughput	1,652.5	478.8	1,173.7
Transmission of Gas by Others	Resale	936.3	936.3	-
Total Transmission Expense		2,588.8	1,415.1	1,173.7
Production Expense	Resale	17,624.6	17,624.6	-
Storage Expense	Resale	436.3	436.3	-
Distribution Expense	Throughput	126.5	36.7	89.9
Administrative Expense	Deliveries	1,966.0	780.0	1,186.0
Total Natural Gas Operating Expenses		22,742.2	20,292.6	2,449.6
EXPENSE RATIO Percent of Expenses for Transport or Resale			89.2%	10.8%

Data taken from EIA. 1988. Statistics of Natural Gas Pipeline Companies 1988. DOE/EIA-0145(88). Washigton D.C.: GPO

\- No Entry

Table B-1
Composite Gas Utility Operating Expenses
for Major Interstate Pipelines, 1979-1988

Transportation Services
(millions of dollars)

	1979	1980	1981	1982	1983
Transmission Expense	285.9	381.6	609.1	677.7	639.0
Transmission of Gas by Others	-	-	-	-	-
Total Transmission Expense	285.9	381.6	609.1	677.7	639.0
Production Expense	-	-	-	-	-
Storage Expense	-	-	-	-	-
Distribution Expense	6.2	6.4	9.2	30.6	41.3
Administrative Expense	148.7	174.9	246.0	326.5	396.0
Total Natural Gas Operating Expenses	440.7	562.9	864.3	1,034.8	1,076.4
EXPENSE RATIO	1.8%	1.7%	2.1%	2.1%	2.2%
Percent of Expenses for Transport or Resale					

\- No Entry

Table B-1
Composite Gas Utility Operating Expenses
for Major Interstate Pipelines, 1979-1988

Transportation Services (continued)
(millions of dollars)

	1984	1985	1986	1987	1988
Transmission Expense	747.5	835.5	947.4	1,037.8	1,173.7
Transmission of Gas by Others	-	-	-	-	-
Total Transmission Expense	747.5	835.5	947.4	1,037.8	1,173.7
Production Expense	-	-	-	-	-
Storage Expense	-	-	-	-	-
Distribution Expense	46.9	56.9	44.1	53.8	89.9
Administrative Expense	486.8	640.1	794.3	985.7	1,186.0
Total Natural Gas Operating Expenses	1,281.2	1,532.5	1,785.8	2,077.3	2,449.6
EXPENSE RATIO	2.6%	3.6%	6.5%	9.5%	10.8%
Percent of Expenses for Transport or Resale					

Table B-1 No Entry

Table B-1
Composite Gas Utility Operating Expenses
for Major Interstate Pipelines, 1979-1988

Resale Operations
(millions of dollars)

Year	1979	1980	1981	1982	1983
Transmission Expense	1,006.7	1,259.5	1,473.9	1,596.8	1,380.5
Transmission of Gas by Others	671.7	790.2	1,038.7	1,354.9	1,709.1
Total Transmission Expense	1,678.3	2,049.6	2,512.7	2,951.7	3,089.6
Production Expense	21,737.2	29,644.3	36,706.2	44,449.5	43,516.0
Storage Expense	221.2	252.9	312.9	405.3	440.6
Distribution Expense	21.9	21.2	22.1	72.1	89.3
Administrative Expense	664.6	772.5	824.3	1,075.4	1,179.6
Total Natural Gas Operating Expenses	24,323.2	32,740.5	40,378.2	48,954.0	48,315.1
EXPENSE RATIO	98.2%	98.3%	97.9%	97.9%	97.8%
Percent of Expenses for Transport or Resale					

\- No Entry

Table B-1
Composite Gas Utility Operating Expenses
for Major Interstate Pipelines, 1979-1988

Resale Operations (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Transmission Expense	1,343.8	1,101.0	769.8	511.2	478.8
Transmission of Gas by Others	1,668.9	1,472.2	1,267.3	1,049.1	936.3
Total Transmission Expense	3,012.8	2,573.1	2,037.1	1,560.4	1,415.1
Production Expense	42,407.5	36,739.5	22,207.8	16,954.7	17,624.6
Storage Expense	415.1	418.0	420.2	409.4	436.3
Distribution Expense	84.3	74.9	35.8	26.5	36.7
Administrative Expense	1,210.6	1,190.2	973.6	766.1	780.0
Total Natural Gas Operating Expenses	47,130.3	40,995.8	25,674.5	19,717.1	20,292.6
EXPENSE RATIO	97.4%	96.4%	93.5%	90.5%	89.2%
Percent of Expenses for Transport or Resale					

Table B-1 No Entry

Table B-1
Composite Gas Utility Operating Expenses
for Major Interstate Pipelines, 1979-1988

Total Utility
(millions of dollars)

Year	1979	1980	1981	1982	1983
Transmission Expense	1,292.5	1,641.1	2,083.0	2,274.5	2,019.5
Transmission of Gas by Others	671.7	790.2	1,038.7	1,354.9	1,709.1
Total Transmission Expense	1,964.2	2,431.2	3,121.7	3,629.4	3,728.6
Production Expense	21,737.2	29,644.3	36,706.2	44,449.5	43,516.0
Storage Expense	221.2	252.9	312.9	405.3	440.6
Distribution Expense	28.1	27.6	31.3	102.6	130.7
Administrative Expense	813.3	947.4	1,070.3	1,402.0	1,575.7
Total Natural Gas Operating Expenses	24,764.0	33,303.4	41,242.4	49,988.8	49,391.5
EXPENSE RATIO	100.0%	100.0%	100.0%	100.0%	100.0%
Percent of Expenses for Transport or Resale					

- No Entry

Table B-1
Composite Gas Utility Operating Expenses
for Major Interstate Pipelines, 1979-1988

Total Utility (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Transmission Expense	2,091.3	1,936.5	1,717.2	1,549.0	1,652.5
Transmission of Gas by Others	1,668.9	1,472.2	1,267.3	1,049.1	936.3
Total Transmission Expense	3,760.2	3,408.7	2,984.5	2,598.1	2,588.8
Production Expense	42,407.5	36,739.5	22,207.8	16,954.7	17,624.6
Storage Expense	415.1	418.0	420.2	409.4	436.3
Distribution Expense	131.3	131.8	79.9	80.3	126.5
Administrative Expense	1,697.4	1,830.3	1,767.9	1,751.9	1,966.0
Total Natural Gas Operating Expenses	48,411.5	42,528.3	27,460.3	21,794.4	22,742.2
EXPENSE RATIO Percent of Expenses for Transport or Resale	100.0%	100.0%	100.0%	100.0%	100.0%

- No Entry

Table B-2
Composite Gas Account Statistics
for Major Interstate Pipelines, 1979-1988

Example Allocation
(billions of cubic feet)

Year	Allocated to/by	1988 Utility	1988 Resale	1988 Transport
Natural Gas Sales	Resale	6,405.8	6,405.8	-
Deliveries of Gas for Others	Transport	15,704.6	-	15,704.6
Operational Deliveries		8,901.0	-	-
Total Throughput		31,011.4	6,405.8	15,704.6
Deliveries of Gas by Others	Resale	3,922.8	3,922.8	-
Total Deliveries	Resale	34,934.2	10,328.6	15,704.6
THROUGHPUT RATIO		100.0%	29.0%	71.0%
Percent of Throughput for Resale or Transport Excluding Operational Deliveries				
DELIVERIES RATIO		100.0%	39.7%	60.3%
Percent of Total Deliveries for Resale or Transport Excluding Operational Deliveries				

\- No Entry

Data taken from EIA. 1988. Statistics of
Natural Gas Pipeline Companies 1988.
DOE/EIA-0145(88). Washigton D.C.: GPO

Table B-2
Composite Gas Account Statistics
for Major Interstate Pipelines, 1979-1988

Transportation Services
(billions of cubic feet)

Year	1979	1980	1981	1982	1983
Natural Gas Sales	-	-	-	-	-
Deliveries of Gas for Others	4,284.5	4,528.9	6,286.7	6,125.0	5,972.6
Operational Deliveries	-	-	-	-	-
Total Throughput	4,284.5	4,528.9	6,286.7	6,125.0	5,972.6
Deliveries of Gas by Others	-	-	-	-	-
Total Deliveries	4,284.5	4,528.9	6,286.7	6,125.0	5,972.6
THROUGHPUT RATIO	22.1%	23.3%	29.2%	29.8%	31.6%
Percent of Throughput for Resale or Transport Excluding Operational Deliveries					
DELIVERIES RATIO	18.3%	18.5%	23.0%	23.3%	25.1%
Percent of Total Deliveries for Resale or Transport Excluding Operational Deliveries					

- No Entry

Table B-2
Composite Gas Account Statistics
for Major Interstate Pipelines, 1979-1988

Transportation Services (continued)
(billions of cubic feet)

Year	1984	1985	1986	1987	1988
Natural Gas Sales	-	-	-	-	-
Deliveries of Gas for Others	7,316.3	8,597.1	9,619.9	13,192.4	15,704.6
Operational Deliveries	-	-	-	-	-
Total Throughput	7,316.3	8,597.1	9,619.9	13,192.4	15,704.6
Deliveries of Gas by Others	-	-	-	-	-
Total Deliveries	7,316.3	8,597.1	9,619.9	13,192.4	15,704.6
THROUGHPUT RATIO	35.7%	43.1%	55.2%	67.0%	71.0%
Percent of Throughput for Resale or Transport Excluding Operational Deliveries					
DELIVERIES RATIO	28.7%	35.0%	44.9%	56.3%	60.3%
Percent of Total Deliveries for Resale or Transport Excluding Operational Deliveries					

- No Entry

Table B-2
Composite Gas Account Statistics
for Major Interstate Pipelines, 1979-1988

Resale Operations
(billions of cubic feet)

Year	1979	1980	1981	1982	1983
Natural Gas Sales	15,087.9	14,947.4	15,213.3	14,431.3	12,903.9
Deliveries of Gas for Others	-	-	-	-	-
Operational Deliveries	-	-	-	-	-
Total Throughput	15,087.9	14,947.4	15,213.3	14,431.3	12,903.9
Deliveries of Gas by Others	4,065.7	5,057.7	5,850.4	5,742.0	4,885.8
Total Deliveries	19,153.6	20,005.0	21,063.7	20,173.3	17,789.7
THROUGHPUT RATIO	77.9%	76.7%	70.8%	70.2%	68.4%
Percent of Throughput for Resale or Transport Excluding Operational Deliveries					
DELIVERIES RATIO	81.7%	81.5%	77.0%	76.7%	74.9%
Percent of Total Deliveries for Resale or Transport Excluding Operational Deliveries					

- No Entry

Table B-2
Composite Gas Account Statistics
for Major Interstate Pipelines, 1979-1988

Resale Operations (continued)
(billions of cubic feet)

Year	1984	1985	1986	1987	1988
Natural Gas Sales	13,153.7	11,328.5	7,816.3	6,498.9	6,405.8
Deliveries of Gas for Others	-	-	-	-	-
Operational Deliveries	-	-	-	-	-
Total Throughput	13,153.7	11,328.5	7,816.3	6,498.9	6,405.8
Deliveries of Gas by Others	5,039.8	4,655.2	3,975.1	3,754.4	3,922.8
Total Deliveries	18,193.5	15,983.7	11,791.4	10,253.4	10,328.6
THROUGHPUT RATIO Percent of Throughput for Resale or Transport Excluding Operational Deliveries	64.3%	56.9%	44.8%	33.0%	29.0%
DELIVERIES RATIO Percent of Total Deliveries for Resale or Transport Excluding Operational Deliveries	71.3%	65.0%	55.1%	43.7%	39.7%

- No Entry

Table B-2
Composite Gas Account Statistics
for Major Interstate Pipelines, 1979-1988

Total Utility
(billions of cubic feet)

Year	1979	1980	1981	1982	1983
Natural Gas Sales	15,087.9	14,947.4	15,213.3	14,431.3	12,903.9
Deliveries of Gas for Others	4,284.5	4,528.9	6,286.7	6,125.0	5,972.6
Operational Deliveries	7,760.4	7,882.2	8,310.9	8,834.9	8,052.6
Total Throughput	27,132.8	27,358.4	29,810.9	29,391.2	26,929.1
Deliveries of Gas by Others	4,065.7	5,057.7	5,850.4	5,742.0	4,885.8
Total Deliveries	31,198.6	32,416.1	35,661.3	35,133.2	31,814.8
THROUGHPUT RATIO	100.0%	100.0%	100.0%	100.0%	100.0%
Percent of Throughput for Resale or Transport Excluding Operational Deliveries					
DELIVERIES RATIO	100.0%	100.0%	100.0%	100.0%	100.0%
Percent of Total Deliveries for Resale or Transport Excluding Operational Deliveries					

Table B-2
Composite Gas Account Statistics
for Major Interstate Pipelines, 1979-1988

Total Utility (continued)
(billions of cubic feet)

Year	1984	1985	1986	1987	1988
Natural Gas Sales	13,153.7	11,328.5	7,816.3	6,498.9	6,405.8
Deliveries of Gas for Others	7,316.3	8,597.1	9,619.9	13,192.4	15,704.6
Operational Deliveries	9,235.2	8,614.0	8,082.0	8,669.9	8,901.0
Total Throughput	29,705.2	28,539.5	25,518.2	28,361.2	31,011.4
Deliveries of Gas by Others	5,039.8	4,655.2	3,975.1	3,754.4	3,922.8
Total Deliveries	34,745.0	33,194.7	29,493.3	32,115.7	34,934.2
THROUGHPUT RATIO	100.0%	100.0%	100.0%	100.0%	100.0%
Percent of Throughput for Resale or Transport Excluding Operational Deliveries					
DELIVERIES RATIO	100.0%	100.0%	100.0%	100.0%	100.0%
Percent of Total Deliveries for Resale or Transport Excluding Operational Deliveries					

Appendix C

Determination of Assets

Gas Utility Capital Assets

The composite balance sheet for all major interstate natural gas pipeline companies is shown in tables C-1, C-3 C-4, and C-5. Utility capital assets is shown in table C-1. Production plant assets are allocated to the resale balance sheet. Included is any minor manufactured gas production plant assets. Storage assets are also placed in the resale balance sheet.

Similar to expenses, transmission and distribution assets are divided based on delivery throughput. General plant assets which includes corporate buildings, office equipment, furniture, transportation equipment, communication equipment and other utility tangible property is divided based on total customer deliveries.

The division of intangible plant and other plant adjustments accounts is in the same proportion of the total utility assets already divided (Asset Ratio).

Additions to the gas utility plant is seen in table C-2. Division between resale and transport is in the same method used for total utility assets. The account gas construction work in progress is divided in the proportion of new additions. This assumes utility construction is in the same proportion as new additions to the utility plant.

Accumulated depreciation, depletion, and amortization is divided in proportion of gas utility capital assets. Net other utility plant, assets that do not fall into previous categories, are also divided based on total capital assets.

Other property investments include nonutility property, investments in associated companies, investments in subsidiary companies, general investments, and special funds. These assets are not used in the operation of the gas utility nor listed in the thesis balance sheet.

Table C-1
Composite Gas Utility Capital Assets
for Major Interstate Pipelines, 1979-1988

Example Allocation
(millions of dollars)

Utility Plant	Allocated to/by	1988 Utility	1988 Resale	1988 Transport
Intangible Plant	Asset	92.4	39.2	53.2
Other Plant Adjustments	Asset	8.4	3.6	4.9
Production Plant	Resale	5,424.2	5,424.2	-
Storage Plant	Resale	2,690.5	2,690.5	-
Transmission Plant	Throughput	32,125.0	9,307.2	22,817.7
Distribution Plant	Throughput	2,223.3	644.1	1,579.2
General Plant	Deliveries	1,541.3	611.5	929.8
Total Gas Utility Plant in Service		44,105.1	18,720.3	25,384.8
Utility in Construction	New Asset	897.0	315.2	581.8
Total Gas Utility Plant		45,002.1	19,035.6	25,966.5
Acumulated Depreciation, Depletion and Amortization	Asset	26,137.1	11,093.9	15,043.3
Net Gas Utility Plant		18,865.0	7,941.7	10,923.3
Net Other Utility Plant	Asset	92.1	39.1	53.0
Net All Utility Plant		18,957.1	7,980.8	10,976.3
ASSET RATIO		100.0%	42.4%	57.6%

Percent Ratio of Capital Assets Used for Transport or Resale

Data taken from EIA. 1988. Statistics of Natural Gas Pipeline Companies 1988. DOE/EIA-0145(88). Washigton D.C.: GPO`

\- No Entry

Table C-1
Composite Gas Utility Capital Assets
for Major Interstate Pipelines, 1979-1988

Transportation Services
(millions of dollars)

Utility Plant	1979	1980	1981	1982	1983
Intangible Plant	7.6	7.6	10.9	11.8	13.2
Other Plant Adjustments	-	-	0.8	2.4	0.2
Production Plant	-	-	-	-	-
Storage Plant	-	-	-	-	-
Transmission Plant	4,124.4	4,542.6	6,336.5	7,055.8	8,311.4
Distribution Plant	54.4	56.7	76.8	426.8	549.4
General Plant	94.7	113.5	173.5	247.8	309.1
Total Gas Utility Plant in Service	4,281.1	4,720.4	6,598.5	7,744.7	9,183.2
Utility in Construction	112.2	137.0	242.3	427.2	204.2
Total Gas Utility Plant	4,393.3	4,857.4	6,840.8	8,171.9	9,387.4
Acumulated Depreciation, Depletion and Amortization	2,194.8	2,448.6	3,372.7	3,882.6	4,552.6
Net Gas Utility Plant	2,198.5	2,408.7	3,468.1	4,289.3	4,834.9
Net Other Utility Plant	5.7	8.7	12.3	12.9	13.3
Net All Utility Plant	2,204.2	2,417.5	3,480.4	4,302.2	4,848.2
ASSET RATIO	16.4%	16.8%	21.2%	21.5%	22.9%
Percent Ratio of Capital Assets Used for Transport or Resale					

- No Entry

Table C-1
Composite Gas Utility Capital Assets
for Major Interstate Pipelines, 1979-1988

Transportation Services (continued)
(millions of dollars)

Utility Plant	1984	1985	1986	1987	1988
Intangible Plant	14.5	19.3	27.4	36.5	53.2
Other Plant Adjustments	(0.1)	(0.1)	(0.1)	4.0	4.9
Production Plant	-	-	-	-	-
Storage Plant	-	-	-	-	-
Transmission Plant	9,697.1	12,398.5	16,531.7	20,609.2	22,817.7
Distribution Plant	704.4	820.0	809.5	1,009.0	1,579.2
General Plant	402.1	520.4	628.5	822.7	929.8
Total Gas Utility Plant in Service	10,818.0	13,758.1	17,996.9	22,481.4	25,384.8
Utility in Construction	225.4	244.1	335.3	505.5	581.8
Total Gas Utility Plant	11,043.4	14,002.3	18,332.2	22,986.9	25,966.5
Acumulated Depreciation, Depletion and Amortization	5,659.3	7,374.9	10,112.0	13,035.2	15,043.3
Net Gas Utility Plant	5,384.1	6,627.4	8,220.2	9,951.6	10,923.3
Net Other Utility Plant	16.7	28.8	38.5	44.7	53.0
Net All Utility Plant	5,400.8	6,656.2	8,258.7	9,996.4	10,976.3
ASSET RATIO Percent Ratio of Capital Assets Used for Transport or Resale	26.2%	32.1%	42.6%	53.0%	57.6%

- No Entry

Table C-1
Composite Gas Utility Capital Assets
for Major Interstate Pipelines, 1979-1988

Resale Operations
(millions of dollars)

Utility Plant	1979	1980	1981	1982	1983
Intangible Plant	39.0	37.6	40.4	43.3	44.6
Other Plant Adjustments	-	-	3.0	9.0	0.5
Production Plant	4,872.0	5,646.9	6,242.1	7,244.9	7,738.0
Storage Plant	1,796.3	2,000.4	2,078.2	2,581.4	3,101.9
Transmission Plant	14,524.1	14,992.5	15,333.6	16,624.5	17,956.8
Distribution Plant	191.4	187.3	185.8	1,005.5	1,187.0
General Plant	423.3	501.2	581.4	816.1	920.5
Total Gas Utility Plant in Service	21,846.1	23,365.9	24,464.5	28,324.6	30,949.4
Utility in Construction	883.1	974.0	977.6	1,831.1	574.3
Total Gas Utility Plant	22,729.2	24,340.0	25,442.1	30,155.7	31,523.7
Acumulated Depreciation, Depletion and Amortization	11,199.9	12,120.8	12,504.6	14,199.8	15,343.1
Net Gas Utility Plant	11,529.2	12,219.1	12,937.5	15,956.0	16,180.6
Net Other Utility Plant	29.1	43.2	45.6	47.3	44.8
Net All Utility Plant	11,558.3	12,262.3	12,983.1	16,003.3	16,225.4
ASSET RATIO Percent Ratio of Capital Assets Used for Transport or Resale	83.6%	83.2%	78.8%	78.5%	77.1%

\- No Entry

Table C-1
Composite Gas Utility Capital Assets
for Major Interstate Pipelines, 1979-1988

Resale Operations (continued)
(millions of dollars)

Utility Plant	1984	1985	1986	1987	1988
Intangible Plant	40.9	40.8	36.8	32.3	39.2
Other Plant Adjustments	(0.3)	(0.2)	(0.2)	3.6	3.6
Production Plant	8,053.4	7,979.8	6,635.3	5,914.2	5,424.2
Storage Plant	2,622.1	2,698.8	2,708.4	2,685.2	2,690.5
Transmission Plant	17,433.9	16,337.7	13,432.2	10,152.6	9,307.2
Distribution Plant	1,266.4	1,080.6	657.7	497.1	644.1
General Plant	999.9	967.5	770.4	639.4	611.5
Total Gas Utility Plant in Service	30,416.2	29,105.0	24,240.7	19,924.4	18,720.3
Utility in Construction	645.1	486.0	386.7	343.7	315.2
Total Gas Utility Plant	31,061.3	29,591.0	24,627.3	20,268.0	19,035.6
Acumulated Depreciation, Depletion and Amortization	15,912.0	15,601.3	13,620.2	11,552.6	11,093.9
Net Gas Utility Plant	15,149.3	13,989.7	11,007.2	8,715.4	7,941.7
Net Other Utility Plant	46.9	61.0	51.9	39.7	39.1
Net All Utility Plant	15,196.2	14,050.7	11,059.0	8,755.1	7,980.8
ASSET RATIO Percent Ratio of Capital Assets Used for Transport or Resale	73.8%	67.9%	57.4%	47.0%	42.4%

- No Entry

Table C-1
Composite Gas Utility Capital Assets
for Major Interstate Pipelines, 1979-1988

Total Utility
(millions of dollars)

Utility Plant	1979	1980	1981	1982	1983
Intangible Plant	46.6	45.2	51.3	55.2	57.9
Other Plant Adjustments	-	-	3.9	11.4	0.7
Production Plant	4,872.0	5,646.9	6,242.1	7,244.9	7,738.0
Storage Plant	1,796.3	2,000.4	2,078.2	2,581.4	3,101.9
Transmission Plant	18,648.5	19,535.0	21,670.1	23,680.3	26,268.2
Distribution Plant	245.8	244.0	262.6	1,432.3	1,736.3
General Plant	518.0	614.7	755.0	1,063.9	1,229.6
Total Gas Utility Plant in Service	26,127.2	28,086.3	31,063.0	36,069.3	40,132.6
Utility in Construction	995.2	1,111.1	1,219.9	2,258.3	778.5
Total Gas Utility Plant	27,122.5	29,197.4	32,282.9	38,327.6	40,911.1
Acumulated Depreciation, Depletion and Amortization	13,394.8	14,569.5	15,877.3	18,082.4	19,895.6
Net Gas Utility Plant	13,727.7	14,627.9	16,405.6	20,245.2	21,015.5
Net Other Utility Plant	34.8	51.9	58.0	60.3	58.1
Net All Utility Plant	13,762.5	14,679.8	16,463.5	20,305.5	21,073.6

ASSET RATIO
Percent Ratio of Capital Assets Used
for Transport or Resale

\- No Entry

Table C-1
Composite Gas Utility Capital Assets
for Major Interstate Pipelines, 1979-1988

Total Utility (continued)
(millions of dollars)

Utility Plant	1984	1985	1986	1987	1988
Intangible Plant	55.4	60.1	64.2	68.8	92.4
Other Plant Adjustments	(0.5)	(0.3)	(0.3)	7.6	8.4
Production Plant	8,053.4	7,979.8	6,635.3	5,914.2	5,424.2
Storage Plant	2,622.1	2,698.8	2,708.4	2,685.2	2,690.5
Transmission Plant	27,131.0	28,736.3	29,963.8	30,761.7	32,125.0
Distribution Plant	1,970.8	1,900.6	1,467.2	1,506.1	2,223.3
General Plant	1,401.9	1,487.8	1,398.9	1,462.1	1,541.3
Total Gas Utility Plant in Service	41,234.2	42,863.1	42,237.6	42,405.7	44,105.1
Utility in Construction	870.5	730.1	722.0	849.2	897.0
Total Gas Utility Plant	42,104.7	43,593.3	42,959.5	43,254.9	45,002.1
Acumulated Depreciation, Depletion and Amortization	21,571.3	22,976.2	23,732.1	24,587.8	26,137.1
Net Gas Utility Plant	20,533.4	20,617.1	19,227.4	18,667.1	18,865.0
Net Other Utility Plant	63.5	89.8	90.4	84.4	92.1
Net All Utility Plant	20,596.9	20,706.9	19,317.8	18,751.5	18,957.1
ASSET RATIO					
Percent Ratio of Capital Assets Used for Transport or Resale					

- No Entry

Table C-2
Composite Additions to Gas Utility
Capital Assets for Major Interstate
Pipelines, 1979-1988

Example Allocation
(millions of dollars)

	Allocated to/by	1988 Utility	1988 Resale	1988 Transport
Intangible Plant	Asset	23.7	10.0	13.6
Other Plant Adjustments	Asset	68.3	29.0	39.3
Production Plant	Resale	90.8	90.8	-
Storage Plant	Resale	55.5	55.5	-
Transmission Plant	Throughput	967.7	280.4	687.3
Distribution Plant	Throughput	724.0	209.8	514.3
General Plant	Deliveries	210.1	83.3	126.7
Total Additions		2,140.1	758.8	1,381.3
NEW ASSET RATIO		100.0%	35.1%	64.9%

Percent Ratio of New Assets for Transport or Resale
Same Allocation Method Used in Total Capital Assets

Data taken from EIA. 1988. Statistics of Natural Gas Pipeline Companies 1988. DOE/EIA-0145(88). Washigton D.C.: GPO

- No Entry

Table C-2
Composite Additions to Gas Utility
Capital Assets for Major Interstate
Pipelines, 1979-1988

Transportation Services
(millions of dollars)

Year	1979	1980	1981	1982	1983
Intangible Plant	0.3	0.3	1.0	0.6	0.3
Other Plant Adjustments	1.5	0.0	1.3	4.2	(1.0)
Production Plant	-	-	-	-	-
Storage Plant	-	-	-	-	-
Transmission Plant	158.0	218.0	520.0	479.2	661.2
Distribution Plant	4.7	4.8	6.0	22.5	23.0
General Plant	15.3	23.4	41.3	47.0	55.3
Total Additions	179.8	246.5	569.6	553.5	738.8
NEW ASSET RATIO	11.3%	12.3%	19.9%	18.9%	26.2%

Percent Ratio of New Assets for Transport or Resale
Same Allocation Method Used in Total Capital Assets

- No Entry
a Less than .1 Million Dollars

Table C-2
Composite Additions to Gas Utility
Capital Assets for Major Interstate
Pipelines, 1979-1988

Transportation Services (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Intangible Plant	0.8	1.0	1.8	2.5	13.6
Other Plant Adjustments	139.6	1.8	3.9	1.3	39.3
Production Plant	-	-	-	-	-
Storage Plant	-	-	-	-	-
Transmission Plant	299.3	546.2	504.4	591.1	687.3
Distribution Plant	39.8	47.4	47.1	43.7	514.3
General Plant	51.4	64.9	60.7	89.9	126.7
Total Additions	531.0	661.2	617.9	728.5	1,381.3
NEW ASSET RATIO	25.9%	33.4%	46.4%	59.5%	64.9%

Percent Ratio of New Assets for Transport or Resale
Same Allocation Method Used in Total Capital Assets

- No Entry
a Less than .1 Million Dollars

Table C-2
Composite Additions to Gas Utility
Capital Assets for Major Interstate
Pipelines, 1979-1988

Resale Operations
(millions of dollars)

Year	1979	1980	1981	1982	1983
Intangible Plant	1.3	1.3	3.8	2.1	1.1
Other Plant Adjustments	7.7	0.1	4.8	15.3	(3.4)
Production Plant	634.4	698.0	801.7	808.1	361.0
Storage Plant	125.4	213.5	75.5	207.2	75.6
Transmission Plant	556.4	719.5	1,258.4	1,129.0	1,428.5
Distribution Plant	16.5	15.8	14.4	53.0	49.7
General Plant	68.5	103.5	138.5	154.8	164.6
Total Additions	1,410.3	1,751.7	2,297.1	2,369.6	2,077.1
NEW ASSET RATIO	88.7%	87.7%	80.1%	81.1%	73.8%

Percent Ratio of New Assets for Transport or Resale
Same Allocation Method Used in Total Capital Assets

\- No Entry
a Less than .1 Million Dollars

Table C-2
Composite Additions to Gas Utility
Capital Assets for Major Interstate
Pipelines, 1979-1988

Resale Operations (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Intangible Plant	2.3	2.1	2.4	2.2	10.0
Other Plant Adjustments	392.5	3.8	5.2	1.2	29.0
Production Plant	323.3	337.8	141.0	83.2	90.8
Storage Plant	56.6	70.4	42.6	26.9	55.5
Transmission Plant	538.2	719.7	409.9	291.2	280.4
Distribution Plant	71.6	62.5	38.3	21.5	209.8
General Plant	127.9	120.6	74.4	69.8	83.3
Total Additions	1,512.4	1,316.8	713.7	496.1	758.8
NEW ASSET RATIO	74.1%	66.6%	53.6%	40.5%	35.1%

Percent Ratio of New Assets for Transport or Resale
Same Allocation Method Used in Total Capital Assets

\- No Entry
a Less than .1 Million Dollars

Table C-2
Composite Additions to Gas Utility
Capital Assets for Major Interstate
Pipelines, 1979-1988

Total Utility
(millions of dollars)

Year	1979	1980	1981	1982	1983
Intangible Plant	1.6	1.5	4.8	2.7	1.5
Other Plant Adjustments	9.2	0.1	6.1	19.5	(4.4)
Production Plant	634.4	698.0	801.7	808.1	361.0
Storage Plant	125.4	213.5	75.5	207.2	75.6
Transmission Plant	714.4	937.6	1,778.4	1,608.2	2,089.7
Distribution Plant	21.2	20.6	20.4	75.5	72.7
General Plant	83.8	126.9	179.8	201.8	219.9
Total Additions	1,590.1	1,998.2	2,866.8	2,923.0	2,815.9

NEW ASSET RATIO
Percent Ratio of New Assets for Transport or Resale
Same Allocation Method Used in Total Capital Assets

- No Entry
a Less than .1 Million Dollars

Table C-2
Composite Additions to Gas Utility
Capital Assets for Major Interstate
Pipelines, 1979-1988

Total Utility (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Intangible Plant	3.1	3.1	4.2	4.8	23.7
Other Plant Adjustments	532.1	5.6	9.1	2.5	68.3
Production Plant	323.3	337.8	141.0	83.2	90.8
Storage Plant	56.6	70.4	42.6	26.9	55.5
Transmission Plant	837.5	1,265.9	914.3	882.3	967.7
Distribution Plant	111.4	109.9	85.4	65.2	724.0
General Plant	179.3	185.4	135.1	159.7	210.1
Total Additions	2,043.5	1,978.0	1,331.6	1,224.6	2,140.1

NEW ASSET RATIO
Percent Ratio of New Assets for Transport or Resale
Same Allocation Method Used in Total Capital Assets

\- No Entry
a Less than .1 Million Dollars

Current Assets

The division of cash and cash equivalents is based on sale dollar volume (table C-3). Notes and accounts receivables, receivables from associated companies, and prepayments are also divided based on sale dollar volume.

The accounts current gas stored underground, liquefied natural gas, advances for exploration, development, and production, and advances for natural gas purchases relate to company-owned gas. Materials and supplies needed to maintain and run equipment are divided based on capital assets. Unclassified current assets are divided based on sale dollar volume in leu of additional information.

Table C-3
Composite Gas Utility Current Assets
for Major Interstate Pipelines, 1979-1988

Example Allocation
(millions of dollars)

	Allocated to/by	1988 Utility	1988 Resale	1988 Transport
Cash and Equivelents	Sales $	476.2	405.9	70.3
Notes & Accounts Recievable	Sales $	2,970.6	2,532.1	438.5
Recievables from Associated Companies	Sales $	4,392.1	3,743.8	648.3
Materials and Supplies	Asset	429.2	182.2	247.0
Gas Stored UnderGround	Resale	1,740.6	1,740.6	-
Liquefied Natural Gas	Resale	2.9	2.9	-
Prepayments	Sales $	916.9	781.6	135.3
Advances for Ex,Dev,Prod	Resale	5.5	5.5	-
Advances for Gas	Resale	19.4	19.4	-
Other Current and Accrued Assets	Sales $	1,908.1	1,626.4	281.7
Total Current and Accrued Assets		12,861.6	11,040.4	1,821.1

Data taken from EIA. 1988. Statistics of Natural Gas Pipeline Companies 1988. DOE/EIA-0145(88). Washigton D.C.: GPO

\- No Entry

Table C-3
Composite Gas Utility Current Assets
for Major Interstate Pipelines, 1979-1988

Transportation Services
(millions of dollars)

	1979	1980	1981	1982	1983
Cash and Equivelents	11.1	12.7	13.8	11.3	38.9
Notes & Accounts Recievable	68.1	73.5	104.5	134.6	258.2
Recievables from Associated Companies	35.2	27.8	38.6	43.1	74.9
Materials and Supplies	79.2	99.0	144.2	167.0	172.6
Gas Stored UnderGround	-	-	-	-	-
Liquefied Natural Gas	-	-	-	-	-
Prepayments	2.6	3.6	8.0	18.9	48.3
Advances for Ex,Dev,Prod	-	-	-	-	-
Advances for Gas	-	-	-	-	-
Other Current and Accrued Assets	6.7	6.4	11.9	17.4	29.9
Total Current and Accrued Assets	202.9	223.0	321.0	392.3	622.8

\- No Entry

Table C-3
Composite Gas Utility Current Assets
for Major Interstate Pipelines, 1979-1988

Transportation Services (continued)
(millions of dollars)

	1984	1985	1986	1987	1988
Cash and Equivelents	41.6	30.0	67.8	151.3	70.3
Notes & Accounts Recievable	194.1	239.9	304.9	382.1	438.5
Recievables from Associated Companies	111.4	188.3	276.5	356.7	648.3
Materials and Supplies	184.7	186.1	226.4	285.1	247.0
Gas Stored UnderGround	-	-	-	-	-
Liquefied Natural Gas	-	-	-	-	-
Prepayments	51.3	49.2	75.4	121.9	135.3
Advances for Ex,Dev,Prod	-	-	-	-	-
Advances for Gas	-	-	-	-	-
Other Current and Accrued Assets	35.0	56.4	111.9	212.9	281.7
Total Current and Accrued Assets	618.1	749.9	1,062.9	1,510.1	1,821.1

- No Entry

Table C-3
Composite Gas Utility Current Assets
for Major Interstate Pipelines, 1979-1988

Resale Operations
(millions of dollars)

Year	1979	1980	1981	1982	1983
Cash and Equivelents	495.3	641.9	619.3	493.0	1,196.9
Notes & Accounts Recievable	3,037.3	3,706.6	4,700.9	5,876.3	7,948.0
Recievables from Associated Companies	1,572.3	1,403.4	1,735.5	1,881.9	2,306.9
Materials and Supplies	404.2	489.8	534.6	610.7	581.7
Gas Stored UnderGround	981.8	1,126.3	1,626.4	2,387.6	1,792.2
Liquefied Natural Gas	5.2	4.3	5.8	7.5	24.5
Prepayments	116.8	182.9	357.9	822.9	1,486.8
Advances for Ex,Dev,Prod	607.3	614.0	593.5	446.3	231.5
Advances for Gas	63.3	97.9	94.2	57.6	48.7
Other Current and Accrued Assets	299.0	321.3	536.1	760.5	920.4
Total Current and Accrued Assets	7,582.6	8,588.7	10,804.2	13,344.2	16,537.7

Table C-3
Composite Gas Utility Current Assets
for Major Interstate Pipelines, 1979-1988

Resale Operations (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Cash and Equivelents	1,177.3	618.1	690.8	1,000.6	405.9
Notes & Accounts Recievable	5,493.0	4,945.5	3,105.7	2,526.2	2,532.1
Recievables from Associated Companies	3,152.1	3,881.7	2,816.8	2,358.7	3,743.8
Materials and Supplies	519.4	393.8	305.0	252.7	182.2
Gas Stored UnderGround	2,507.7	1,962.4	1,900.2	1,715.7	1,740.6
Liquefied Natural Gas	5.6	3.4	2.3	2.4	2.9
Prepayments	1,450.5	1,013.3	768.1	805.7	781.6
Advances for Ex,Dev,Prod	65.1	18.8	10.3	6.3	5.5
Advances for Gas	55.3	61.4	36.8	22.6	19.4
Other Current and Accrued Assets	989.3	1,163.1	1,139.6	1,407.9	1,626.4
Total Current and Accrued Assets	15,415.3	14,061.6	10,775.7	10,098.8	11,040.4

Table C-3
Composite Gas Utility Current Assets
for Major Interstate Pipelines, 1979-1988

Total Utility
(millions of dollars)

Year	1979	1980	1981	1982	1983
Cash and Equivelents	506.4	654.6	633.1	504.3	1,235.8
Notes & Accounts Recievable	3,105.4	3,780.2	4,805.4	6,010.9	8,206.1
Recievables from Associated Companies	1,607.5	1,431.3	1,774.1	1,925.0	2,381.8
Materials and Supplies	483.4	588.8	678.8	777.7	754.3
Gas Stored UnderGround	981.8	1,126.3	1,626.4	2,387.6	1,792.2
Liquefied Natural Gas	5.2	4.3	5.8	7.5	24.5
Prepayments	119.5	186.6	365.9	841.8	1,535.1
Advances for Ex,Dev,Prod	607.3	614.0	593.5	446.3	231.5
Advances for Gas	63.3	97.9	94.2	57.6	48.7
Other Current and Accrued Assets	305.7	327.7	548.1	777.9	950.3
Total Current and Accrued Assets	7,785.5	8,811.8	11,125.2	13,736.5	17,160.5

Table C-3
Composite Gas Utility Current Assets
for Major Interstate Pipelines, 1979-1988

Total Utility (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Cash and Equivelents	1,218.9	648.0	758.6	1,151.9	476.2
Notes & Accounts Recievable	5,687.1	5,185.4	3,410.6	2,908.2	2,970.6
Recievables from Associated Companies	3,263.5	4,070.0	3,093.3	2,715.4	4,392.1
Materials and Supplies	704.1	579.9	531.4	537.8	429.2
Gas Stored UnderGround	2,507.7	1,962.4	1,900.2	1,715.7	1,740.6
Liquefied Natural Gas	5.6	3.4	2.3	2.4	2.9
Prepayments	1,501.7	1,062.5	843.5	927.6	916.9
Advances for Ex,Dev,Prod	65.1	18.8	10.3	6.3	5.5
Advances for Gas	55.3	61.4	36.8	22.6	19.4
Other Current and Accrued Assets	1,024.3	1,219.5	1,251.5	1,620.9	1,908.1
Total Current and Accrued Assets	16,033.4	14,811.5	11,838.6	11,608.9	12,861.6

Deferred Debits

Deferred debits are shown in table C-4. All deferred debits relating to interest and income taxes: unamortized debt expense, unamortized loss on reacquired debt and accumulated deferred income taxes have been taken out of the evaluation. Unrecovered purchased gas costs, unrecovered incremental gas costs, and unrecovered incremental surcharges are placed in the resale balance sheet. Extraordinary property losses, unrecovered plant and regulatory study costs, preliminary survey and investigation costs, and deferred losses from disposition of utility plant relating to utility capital are divided based on gas utility capital assets.

Division of deferred research and development expenses is based on the ratio of operating expenses under the assumption that research and development is conducted to reduce future expenses. Other deferred debits are also divided on the same basis with the assumption that they are some sort of prepaid or deferred expenses.

Table C-4
Composite Gas Utility Deferred Debits
for Major Interstate Pipelines, 1979-1988

Example Allocation
(millions of dollars)

	Allocated to/by	1988 Utility	1988 Resale	1988 Transport
Extraordinary Property Losses	Asset	4.3	1.8	2.5
Unrecovered Plant and Regulatory Study Costs	Asset	0.5	0.2	0.3
Preliminary Survey and Investigation Costs	Asset	21.1	8.9	12.1
Clearing Costs	Asset	19.1	8.1	11.0
Deferred Losses from Disposal of Utility Plant	Asset	a	a	a
Reasearch and Developement	Expenses	(0.6)	(0.6)	a
Unrecovered Purchased Gas Cost	Resale	1,702.4	1,702.4	-
Unrecovered Incremental Gas Cost	Resale	-	-	-
Unrecovered Incremental Surcharges	Resale	-	-	-
Other Deferred Debits	Expenses	3,766.7	3,361.0	405.7
Total Deferred Debits		5,513.5	5,081.9	431.5

Data taken from EIA. 1988. Statistics of Natural Gas Pipeline Companies 1988. DOE/EIA-0145(88). Washigton D.C.: GPO

\- No Entry
a Less than .1 Million Dollars

Table C-4
Composite Gas Utility Deferred Debits
for Major Interstate Pipelines, 1979-1988

Transportation Services
(millions of dollars)

	1979	1980	1981	1982	1983
Extraordinary Property Losses	2.0	1.6	1.3	0.7	(0.1)
Unrecovered Plant and Regulatory Study Costs	-	-	-	-	-
Preliminary Survey and Investigation Costs	3.9	4.1	4.0	3.1	2.5
Clearing Costs	1.0	0.7	0.7	1.9	0.2
Deferred Losses from Disposal of Utility Plant	-	-	-	-	-
Reasearch and Developement	0.4	0.1	0.1	0.1	a
Unrecovered Purchased Gas Cost	-	-	-	-	-
Unrecovered Incremental Gas Cost	-	-	-	-	-
Unrecovered Incremental Surcharges	-	-	-	-	-
Other Deferred Debits	3.6	3.9	7.5	10.6	19.4
Total Deferred Debits	10.8	10.4	13.6	16.4	21.9

\- No Entry
a Less than .1 Million Dollars

Table C-4
Composite Gas Utility Deferred Debits
for Major Interstate Pipelines, 1979-1988

Transportation Services (continued)
(millions of dollars)

	1984	1985	1986	1987	1988
Extraordinary Property Losses	(0.2)	(0.2)	a	2.3	2.5
Unrecovered Plant and Regulatory Study Costs	1.0	1.0	0.9	0.7	0.3
Preliminary Survey and Investigation Costs	2.5	3.6	4.2	7.2	12.1
Clearing Costs	1.9	3.6	(7.4)	9.0	11.0
Deferred Losses from Disposal of Utility Plant	0.3	0.3	0.3	0.3	a
Reasearch and Developement	0.1	0.1	a	a	(0.1)
Unrecovered Purchased Gas Cost	-	-	-	-	-
Unrecovered Incremental Gas Cost	-	-	-	-	-
Unrecovered Incremental Surcharges	-	-	-	-	-
Other Deferred Debits	38.9	60.4	192.4	407.6	405.7
Total Deferred Debits	44.5	68.8	190.4	427.1	431.5

- No Entry
a Less than .1 Million Dollars

Table C-4
Composite Gas Utility Deferred Debits
for Major Interstate Pipelines, 1979-1988

Resale Operations
(millions of dollars)

	1979	1980	1981	1982	1983
Extraordinary Property Losses	10.4	7.9	4.9	2.4	(0.4)
Unrecovered Plant and Regulatory Study Costs	-	-	-	-	-
Preliminary Survey and Investigation Costs	19.9	20.5	14.7	11.5	8.3
Clearing Costs	5.0	3.5	2.7	6.9	0.5
Deferred Losses from Disposal of Utility Plant	-	-	-	-	-
Reasearch and Developement	19.9	5.7	4.1	2.4	(0.2)
Unrecovered Purchased Gas Cost	1,020.0	560.9	1,289.3	1,724.1	1,183.3
Unrecovered Incremental Gas Cost	-	0.3	7.1	(12.8)	2.4
Unrecovered Incremental Surcharges	-	(2.1)	0.1	-	-
Other Deferred Debits	196.4	224.5	349.2	503.3	870.2
Total Deferred Debits	1,271.6	823.0	1,664.9	2,250.7	2,061.6

- No Entry
a Less than .1 Million Dollars

Table C-4
Composite Gas Utility Deferred Debits
for Major Interstate Pipelines, 1979-1988

Resale Operations (continued)
(millions of dollars)

	1984	1985	1986	1987	1988
Extraordinary Property Losses	(0.5)	(0.3)	0.1	2.0	1.8
Unrecovered Plant and Regulatory Study Costs	2.8	2.1	1.2	0.6	0.2
Preliminary Survey and Investigation Costs	7.1	7.7	5.6	6.4	8.9
Clearing Costs	5.3	7.5	(10.0)	8.0	8.1
Deferred Losses from Disposal of Utility Plant	0.9	0.6	0.4	0.2	a
Reasearch and Developement	2.0	1.6	0.1	0.1	(0.6)
Unrecovered Purchased Gas Cost	851.8	646.8	616.8	1,415.3	1,702.4
Unrecovered Incremental Gas Cost	-	a	-	-	-
Unrecovered Incremental Surcharges	-	a	-	-	-
Other Deferred Debits	1,431.9	1,615.8	2,766.7	3,869.0	3,361.0
Total Deferred Debits	2,301.3	2,281.8	3,380.8	5,301.6	5,081.9

- No Entry
a Less than .1 Million Dollars

Table C-4
Composite Gas Utility Deferred Debits
for Major Interstate Pipelines, 1979-1988

Total Utility
(millions of dollars)

	1979	1980	1981	1982	1983
Extraordinary Property Losses	12.5	9.5	6.3	3.0	(0.5)
Unrecovered Plant and Regulatory Study Costs	-	-	-	-	-
Preliminary Survey and Investigation Costs	23.8	24.7	18.6	14.6	10.7
Clearing Costs	5.9	4.1	3.5	8.8	0.7
Deferred Losses from Disposal of Utility Plant	-	-	-	-	-
Reasearch and Developement	20.3	5.8	4.2	2.5	(0.2)
Unrecovered Purchased Gas Cost	1,020.0	560.9	1,289.3	1,724.1	1,183.3
Unrecovered Incremental Gas Cost	-	0.3	7.1	(12.8)	2.4
Unrecovered Incremental Surcharges	-	(2.1)	0.1	-	-
Other Deferred Debits	200.0	228.3	356.7	514.0	889.5
Total Deferred Debits	1,282.4	831.5	1,685.7	2,254.3	2,085.9

\- No Entry
a Less than .1 Million Dollars

Table C-4
Composite Gas Utility Deferred Debits
for Major Interstate Pipelines, 1979-1988

Total Utility (continued)
(millions of dollars)

	1984	1985	1986	1987	1988
Extraordinary Property Losses	(0.7)	(0.5)	0.1	4.4	4.3
Unrecovered Plant and Regulatory Study Costs	3.9	3.1	2.1	1.3	0.5
Preliminary Survey and Investigation Costs	9.6	11.3	9.8	13.6	21.1
Clearing Costs	7.1	11.1	(17.5)	17.0	19.1
Deferred Losses from Disposal of Utility Plant	1.2	1.0	0.7	0.5	a
Reasearch and Developement	2.1	1.7	0.1	0.1	(0.6)
Unrecovered Purchased Gas Cost	851.8	646.8	616.8	1,415.3	1,702.4
Unrecovered Incremental Gas Cost	-	a	-	-	-
Unrecovered Incremental Surcharges	-	a	-	-	-
Other Deferred Debits	1,470.9	1,676.2	2,959.1	4,276.6	3,766.7
Total Deferred Debits	2,345.9	2,350.5	3,571.2	5,728.8	5,513.5

\- No Entry
a Less than .1 Million Dollars

Consolidated Balance Sheet

Table C-5 illustrates the composite balance sheet for all major interstate natural gas pipelines for the years 1979-1988. Only totals from tables C-1, C-3, and C-4 are included. There is no division of the liability and equity side of the balance sheet. Noncurrent gas stored underground which does not fall into any of the previous subcatagories is placed in the resale balance sheet. Utility plant adjustments are divided based on total assets.

Table C-5
Composite Consolidated Balance Sheet
for Major Interstate Pipelines, 1979-1988

Example Allocation
(millions of dollars)

Assets	Allocated to/by	1988 Utility	1988 Resale*	1988 Transport*
Net All Utility Plant		18,957.1	7,980.8	10,976.3
Gas Stored Underground (Noncurrent)	Resale	1,071.0	1,071.0	-
Utility Plant Adjustments	Asset	-	-	-
Total Current and Accrued Assets		12,861.6	11,040.4	1,821.1
Total Deferred Debits		5,513.5	5,081.9	431.5
Total Assits and Other Debits **		38,403.1	25,174.2	13,228.9
Liabilities and Owners Equity				
Proprietary Capital		18,820.3		
Long-term Debt		14,446.5		
Other Noncurrent Liabilities		2,103.6		
Current and Accrued Liabilities		21,239.2		
Deferred Credits		8,132.6		
Total Liabilities and Other Credits **		64,742.2		

* Resale and Transport Credits not Divided

** Difference Between Credits and Debits Equals Amount of Non Gas Utility Assets and Income Tax/ Interest Related Deferred Debits Removed from the Evaluation.

\- No Entry

Data taken from EIA. 1988. Statistics of Natural Gas Pipeline Companies 1988. DOE/EIA-0145(88). Washigton D.C.: GPO

Table C-5
Composite Consolidated Balance Sheet
for Major Interstate Pipelines, 1979-1988

Transportation Services
(millions of dollars)

Assets	1979	1980	1981	1982	1983
Net All Utility Plant	2,204.2	2,417.5	3,480.4	4,302.2	4,848.2
Gas Stored Underground (Noncurrent)	-	-	-	-	-
Utility Plant Adjustments	0.2	0.1	-	-	-
Total Current and Accrued Assets	202.9	223.0	321.0	392.3	622.8
Total Deferred Debits	10.8	10.4	13.6	16.4	21.9
Total Assits and Other Debits	2,417.9	2,650.9	3,815.0	4,710.9	5,492.9

- No Entry

Table C-5
Composite Consolidated Balance Sheet
for Major Interstate Pipelines, 1979-1988

Transportation Services (continued)
(millions of dollars)

Assets	1984	1985	1986	1987	1988
Net All Utility Plant	5,400.8	6,656.2	8,258.7	9,996.4	10,976.3
Gas Stored Underground (Noncurrent)	-	-	-	-	-
Utility Plant Adjustments	-	-	-	-	-
Total Current and Accrued Assets	618.1	749.9	1,062.9	1,510.1	1,821.1
Total Deferred Debits	44.5	68.8	190.4	427.1	431.5
Total Assits and Other Debits	6,063.4	7,474.9	9,512.0	11,933.6	13,228.9

- No Entry

Table C-5
Composite Consolidated Balance Sheet
for Major Interstate Pipelines, 1979-1988

Resale Operations
(millions of dollars)

Assets	1979	1980	1981	1982	1983
Net All Utility Plant	11,558.3	12,262.3	12,983.1	16,003.3	16,225.4
Gas Stored Underground (Noncurrent)	595.6	712.3	728.2	1,176.8	1,065.5
Utility Plant Adjustments	0.9	0.4	-	-	-
Total Current and Accrued Assets	7,582.6	8,588.7	10,804.2	13,344.2	16,537.7
Total Deferred Debits	1,271.6	823.0	1,664.9	2,250.7	2,061.6
Total Assits and Other Debits	21,008.1	22,386.3	26,180.4	32,775.0	35,890.3

- No Entry

Table C-5
Composite Consolidated Balance Sheet
for Major Interstate Pipelines, 1979-1988

Resale Operations (continued)
(millions of dollars)

Assets	1984	1985	1986	1987	1988
Net All Utility Plant	15,196.2	14,050.7	11,059.0	8,755.1	7,980.8
Gas Stored Underground (Noncurrent)	1,003.4	1,060.8	1,027.4	1,071.1	1,071.0
Utility Plant Adjustments	-	-	-	-	-
Total Current and Accrued Assets	15,415.3	14,061.6	10,775.7	10,098.8	11,040.4
Total Deferred Debits	2,301.3	2,281.8	3,380.8	5,301.6	5,081.9
Total Assits and Other Debits	33,916.2	31,454.8	26,243.0	25,226.6	25,174.2

- No Entry

Table C-5
Composite Consolidated Balance Sheet
for Major Interstate Pipelines, 1979-1988

Total Utility
(millions of dollars)

Assets	1979	1980	1981	1982	1983
Net All Utility Plant	13,762.5	14,679.8	16,463.5	20,305.5	21,073.6
Gas Stored Underground (Noncurrent)	595.6	712.3	728.2	1,176.8	1,065.5
Utility Plant Adjustments	1.0	0.5	-	-	-
Total Current and Accrued Assets	7,785.5	8,811.8	11,125.2	13,736.5	17,160.5
Total Deferred Debits	1,282.4	831.5	1,685.7	2,254.3	2,085.9
Total Assits and Other Debits **	23,426.0	25,035.4	30,002.6	37,473.1	41,385.6
Liabilities and Owners Equity					
Proprietary Capital	13,709.1	15,632.9	17,837.0	20,524.0	22,389.6
Long-term Debt	9,834.0	10,836.5	12,756.8	15,234.5	15,980.9
Other Noncurrent Liabilities	594.1	403.0	312.7	404.5	470.8
Current and Accrued Liabilities	7,618.4	8,253.4	10,942.4	12,695.3	13,949.3
Deferred Credits	2,704.8	2,801.7	3,535.1	4,753.4	5,813.2
Total Liabilities and Other Credits **	34,460.3	37,927.6	45,384.0	53,611.7	58,603.8

* Resale and Transport Credits not Divided
** Difference Between Credits and Debits Equals Amount of Non Gas Utility Assets and Income Tax/ Interest Related Deferred Debits Removed from the Evaluation.

\- No Entry

Table C-5
Composite Consolidated Balance Sheet
for Major Interstate Pipelines, 1979-1988

Total Utility (continued)
(millions of dollars)

Assets	1984	1985	1986	1987	1988
Net All Utility Plant	20,596.9	20,706.9	19,317.8	18,751.5	18,957.1
Gas Stored Underground (Noncurrent)	1,003.4	1,060.8	1,027.4	1,071.1	1,071.0
Utility Plant Adjustments	-	-	-	-	-
Total Current and Accrued Assets	16,033.4	14,811.5	11,838.6	11,608.9	12,861.6
Total Deferred Debits	2,345.9	2,350.5	3,571.2	5,728.8	5,513.5
Total Assits and Other Debits **	39,979.6	38,929.7	35,755.0	37,160.2	38,403.1
Liabilities and Owners Equity					
Proprietary Capital	23,805.4	22,891.2	19,812.8	19,470.6	18,820.3
Long-term Debt	15,484.3	15,089.5	13,818.3	14,471.4	14,446.5
Other Noncurrent Liabilities	780.8	752.1	831.0	1,599.3	2,103.6
Current and Accrued Liabilities	12,846.2	14,773.1	12,975.8	14,856.8	21,239.2
Deferred Credits	6,364.4	6,570.9	7,030.3	8,165.8	8,132.6
Total Liabilities and Other Credits **	59,281.1	60,076.8	54,468.1	58,563.9	64,742.2

* Resale and Transport Credits not Divided
** Difference Between Credits and Debits Equals Amount of Non Gas Utility Assets and Income Tax/ Interest Related Deferred Debits Removed from the Evaluation.

- No Entry

Appendix D

Determination of Income

The composite income statement for all major interstate natural gas pipeline companies is shown in table D-1. Revenues calculated in Appendix A do not include provisions for rate refunds. Both resale and transportation are discounted an equal percentage when appropriate. Expenses shown are taken from Appendix B.

Depreciation is divided based on total utility capital assets. Amortization and depletion of gas plant and amortization of gas conversion expenses is allocated to resale operations. Amortization of gas property losses, unrecovered plant and regulatory study costs, gains and losses from disposition of gas utility plant are divided based on capital utility assets. Taxes other than income taxes are divided based on capital utility assets in leu of additional information. Income tax is excluded from the analysis. Investment tax credits which are considered discounts for capital expenditures are divided based on total utility assets. Other utility operating income do not refer to specifically to carriage contracts or resale gas and is not included in the evaluation.

A composite condensed operating statement showing revenues, cost of goods sold, and profit margin is shown in table D-2.

Table D-1
Composite Income Statement
for Major Interstate Pipelines, 1979-1988

Example Allocation
(millions of dollars)

	Allocated to/by	1988 Utility	1988 Resale	1988 Transport
Gas Operating Revenue	Appendix A	26,738.5	22,791.6	3,946.9
Gas Operating Expenses				
Operation and Maintenance Expense	Appendix B	22,742.2	20,292.6	2,449.6
Depreciation Expense	Asset	1,532.8	650.6	882.2
Amortization and Depletion of Gas Plant	Resale	18.1	18.1	-
Amortization of Plant Acqusition Adjustment	Asset	a	a	a
Amoritization of Gas Property Losses and Regulatory Study Costs	Asset	1.1	0.5	0.7
Amoritization of Gas Conversion Expenses	Resale	a	a	-
Taxes Other than Income Taxes	Asset	594.9	252.5	342.4
Investment Tax Credit Adjustments--Net	Asset	(6.8)	(2.9)	(3.9)
(Less) Gains Disposition of Utility Plant	Asset	a	a	a
Losses Dispostion of Utility Plant	Asset	0.4	0.2	0.3
Total Gas Operating Expenses		24,882.9	21,211.7	3,671.2
Total Utility Operating Income **		1,855.6	1,579.9	275.7

** Before Interest and Income Taxes

Data taken from EIA. 1988. Statistics of Natural Gas Pipeline Companies 1988. DOE/EIA-0145(88). Washigton D.C.: GPO

\- No Entry
a Less than .1 Million Dollars

Table D-1
Composite Income Statement
for Major Interstate Pipelines, 1979-1988

Transportation Services
(millions of dollars)

Year	1979	1980	1981	1982	1983
Gas Operating Revenue	643.5	744.0	1,010.9	1,258.7	1,786.7
Gas Operating Expenses					
Operation and Maintenance Expense	440.7	562.9	864.3	1,034.8	1,076.4
Depreciation Expense	179.7	196.2	289.3	336.7	391.1
Amortization and Depletion of Gas Plant	-	-	-	-	-
Amortization of Plant Acqusition Adjustment:	a	a	a	a	a
Amoritization of Gas Property Losses and Regulatory Study Costs	0.5	0.5	0.7	0.7	0.7
Amoritization of Gas Conversion Expenses	-	-	-	-	-
Taxes Other than Income Taxes	90.4	108.7	83.8	116.5	137.1
Investment Tax Credit Adjustments--Net	23.0	31.9	49.0	50.1	25.9
(Less) Gains Disposition of Utility Plant	-	a	-	0.2	-
Losses Dispostion of Utility Plant	-	-	a	-	0.1
Total Gas Operating Expenses	734.4	900.3	1,287.1	1,538.6	1,631.2
Total Utility Operating Income **	(90.9)	(156.3)	(276.2)	(279.9)	155.5

** Before Interest and Income Taxes

- No Entry
a Less than .1 Million Dollars

Table D-1
Composite Income Statement
for Major Interstate Pipelines, 1979-1988

Transportation Services (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Gas Operating Revenue	1,914.9	2,266.6	2,990.6	3,508.4	3,946.9
Gas Operating Expenses					
Operation and Maintenance Expense	1,281.2	1,532.5	1,785.8	2,077.3	2,449.6
Depreciation Expense	439.0	509.4	672.9	773.0	882.2
Amortization and Depletion of Gas Plant	-	-	-	-	-
Amortization of Plant Acqusition Adjustment:	a	a	a	a	a
Amoritization of Gas Property Losses					
and Regulatory Study Costs	0.1	0.3	0.1	0.4	0.7
Amoritization of Gas Conversion Expenses	-	-	-	-	-
Taxes Other than Income Taxes	183.3	214.9	235.1	291.3	342.4
Investment Tax Credit Adjustments--Net	27.1	40.9	(1.8)	4.6	(3.9)
(Less) Gains Disposition of Utility Plant	a	a	1.5	a	a
Losses Dispostion of Utility Plant	0.4	0.2	0.1	0.2	0.3
Total Gas Operating Expenses	1,931.0	2,298.3	2,690.7	3,146.8	3,671.2
Total Utility Operating Income **	(16.1)	(31.6)	299.9	361.5	275.7

** Before Interest and Income Taxes

- No Entry
a Less than .1 Million Dollars

Table D-1
Composite Income Statement
for Major Interstate Pipelines, 1979-1988

Resale Operations
(millions of dollars)

Year	1979	1980	1981	1982	1983
Gas Operating Revenue	28,715.2	37,520.4	45,454.1	54,944.8	55,005.7
Gas Operating Expenses					
Operation and Maintenance Expense	24,323.2	32,740.5	40,378.2	48,954.0	48,315.1
Depreciation Expense	917.1	971.3	1,072.7	1,231.5	1,318.1
Amortization and Depletion of Gas Plant	53.1	61.4	67.0	67.7	65.2
Amortization of Plant Acqusition Adjustment	a	a	a	a	a
Amoritization of Gas Property Losses and Regulatory Study Costs	2.5	2.5	2.5	2.5	2.5
Amoritization of Gas Conversion Expenses	a	0.2	0.3	a	a
Taxes Other than Income Taxes	461.4	538.2	310.8	425.9	462.0
Investment Tax Credit Adjustments--Net	117.4	158.1	181.6	183.1	87.2
(Less) Gains Disposition of Utility Plant	a	a	-	0.7	-
Losses Dispostion of Utility Plant	-	-	0.1	-	0.2
Total Gas Operating Expenses	25,874.8	34,472.2	42,013.1	50,864.2	50,250.3
Total Utility Operating Income **	2,840.4	3,048.2	3,441.0	4,080.6	4,755.4

** Before Interest and Income Taxes

- No Entry
a Less than .1 Million Dollars

Table D-1
Composite Income Statement
for Major Interstate Pipelines, 1979-1988

Resale Operations (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Gas Operating Revenue	54,187.3	46,725.1	30,466.2	23,196.0	22,791.6
Gas Operating Expenses					
Operation and Maintenance Expense	47,130.3	40,995.8	25,674.5	19,717.1	20,292.6
Depreciation Expense	1,234.4	1,077.6	906.3	685.1	650.6
Amortization and Depletion of Gas Plant	57.3	67.5	51.1	20.2	18.1
Amortization of Plant Acqusition Adjustment	0.1	a	a	a	a
Amoritization of Gas Property Losses and Regulatory Study Costs	0.3	0.7	0.1	0.4	0.5
Amoritization of Gas Conversion Expenses	a	a	a	a	a
Taxes Other than Income Taxes	515.2	454.6	316.7	258.2	252.5
Investment Tax Credit Adjustments--Net	76.2	86.5	(2.4)	4.1	(2.9)
(Less) Gains Disposition of Utility Plant	a	a	2.0	a	a
Losses Dispostion of Utility Plant	1.0	0.4	0.1	0.1	0.2
Total Gas Operating Expenses	49,014.7	42,683.1	26,944.5	20,685.2	21,211.7
Total Utility Operating Income **	5,172.6	4,042.0	3,521.7	2,510.8	1,579.9

** Before Interest and Income Taxes

- No Entry
a Less than .1 Million Dollars

Table D-1
Composite Income Statement
for Major Interstate Pipelines, 1979-1988

Total Utility
(millions of dollars)

Year	1979	1980	1981	1982	1983
Gas Operating Revenue	29,358.6	38,265.2	46,465.0	56,203.4	56,792.4
Gas Operating Expenses					
Operation and Maintenance Expense	24,764.0	33,303.4	41,242.4	49,988.8	49,391.5
Depreciation Expense	1,096.8	1,167.5	1,362.0	1,568.2	1,709.2
Amortization and Depletion of Gas Plant	53.1	61.4	67.0	67.7	65.2
Amortization of Plant Acqusition Adjustment	a	a	a	a	a
Amoritization of Gas Property Losses and Regulatory Study Costs	2.9	3.0	3.2	3.2	3.2
Amoritization of Gas Conversion Expenses	a	0.2	0.3	a	a
Taxes Other than Income Taxes	551.9	646.9	394.6	542.4	599.1
Investment Tax Credit Adjustments--Net	140.4	190.1	230.6	233.2	113.1
(Less) Gains Disposition of Utility Plant	a	a	-	0.8	-
Losses Dispostion of Utility Plant	-	-	0.1	-	0.3
Total Gas Operating Expenses	26,609.1	35,372.5	43,300.2	52,402.8	51,881.5
Total Utility Operating Income **	2,749.5	2,892.7	3,164.8	3,800.7	4,910.9

** Before Interest and Income Taxes

- No Entry
a Less than .1 Million Dollars

Table D-1
Composite Income Statement
for Major Interstate Pipelines, 1979-1988

Total Utility (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Gas Operating Revenue	56,102.2	48,991.7	33,456.8	26,704.4	26,738.5
Gas Operating Expenses					
Operation and Maintenance Expense	48,411.5	42,528.3	27,460.3	21,794.4	22,742.2
Depreciation Expense	1,673.4	1,587.0	1,579.2	1,458.1	1,532.8
Amortization and Depletion of Gas Plant	57.3	67.5	51.1	20.2	18.1
Amortization of Plant Acqusition Adjustment	0.1	a	a	a	a
Amoritization of Gas Property Losses and Regulatory Study Costs	0.4	1.0	0.2	0.8	1.1
Amoritization of Gas Conversion Expenses	a	a	a	a	a
Taxes Other than Income Taxes	698.5	669.6	551.8	549.5	594.9
Investment Tax Credit Adjustments--Net	103.2	127.5	(4.2)	8.7	(6.8)
(Less) Gains Disposition of Utility Plant	a	0.1	3.5	a	a
Losses Dispostion of Utility Plant	1.3	0.5	0.2	0.3	0.4
Total Gas Operating Expenses	50,945.7	44,981.3	29,635.1	23,832.0	24,882.9
Total Utility Operating Income **	5,156.5	4,010.4	3,821.6	2,872.4	1,855.6

** Before Interest and Income Taxes

- No Entry
a Less than .1 Million Dollars

Table D-2

Composite Condensed Operating Statement

for Major Interstate Pipelines, 1979-1988

Transportation Services

(millions of dollars)

Year	1979	1980	1981	1982	1983
Net Gas Utility Sales	643	744	1,011	1,259	1,787
Cost of Goods (Services) Sold	734	900	1,287	1,539	1,631
Gross Margin	(91)	(156)	(276)	(280)	156
Revenues in Excess of Variable Costs	112	72	62	107	573
Gas Delivered (millions of cubic feet)	4,284.5	4,528.9	6,286.7	6,125.0	5,972.6
Profit per Mcf	($0.021)	($0.035)	($0.044)	($0.046)	$0.026
Revenues in Excess of Variable Costs per Mcf	$0.026	$0.016	$0.010	$0.017	$0.096
$ Sales per Mcf	$0.150	$0.164	$0.161	$0.205	$0.299
Profit per $ Sales	($0.141)	($0.210)	($0.273)	($0.222)	$0.087
Return on Assets	-3.8%	-5.9%	-7.2%	-5.9%	2.8%

Data taken from EIA. 1988. Statistics of Natural Gas Pipeline Companies 1988. DOE/EIA-0145(88). Washigton D.C.: GPO

Table D-2
Composite Condensed Operating Statement
for Major Interstate Pipelines, 1979-1988

Transportation Services (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Net Gas Utility Sales	1,915	2,267	2,991	3,508	3,947
Cost of Goods (Services) Sold	1,931	2,298	2,691	3,147	3,671
Gross Margin	(16)	(32)	300	362	276
Revenues in Excess of Variable Costs	450	519	970	1,139	1,154
Gas Delivered (millions of cubic feet)	7,316.3	8,597.1	9,619.9	13,192.4	15,704.6
Profit per Mcf	($0.002)	($0.004)	$0.031	$0.027	$0.018
Revenues in Excess of Variable Costs per Mcf	$0.062	$0.060	$0.101	$0.086	$0.073
$ Sales per Mcf	$0.262	$0.264	$0.311	$0.266	$0.251
Profit per $ Sales	($0.008)	($0.014)	$0.100	$0.103	$0.070
Return on Assets	-0.3%	-0.4%	3.2%	3.0%	2.1%

Data taken from EIA. 1988. Statistics of Natural Gas Pipeline Companies 1988. DOE/EIA-0145(88). Washigton D.C.: GPO

Table D-2

Composite Condensed Operating Statement

for Major Interstate Pipelines, 1979-1988

Resale Operations

(millions of dollars)

Year	1979	1980	1981	1982	1983
Net Gas Utility Sales	28,715	37,520	45,454	54,945	55,006
Cost of Goods (Services) Sold	25,875	34,472	42,013	50,864	50,250
Gross Margin	2,840	3,048	3,441	4,081	4,755
Revenues in Excess of Variable Costs	3,928	4,239	4,762	5,562	6,226
Gas Delivered (millions of cubic feet)	19,153.6	20,005.0	21,063.7	20,173.3	17,789.7
Profit per Mcf	$0.148	$0.152	$0.163	$0.202	$0.267
Revenues in Excess of Variable Costs per Mcf	$0.205	$0.212	$0.226	$0.276	$0.350
$ Sales per Mcf	$1.499	$1.876	$2.158	$2.724	$3.092
Profit per $ Sales	$0.099	$0.081	$0.076	$0.074	$0.086
Return on Assets	13.5%	13.6%	13.1%	12.5%	13.2%

Table D-2
Composite Condensed Operating Statement
for Major Interstate Pipelines, 1979-1988

Resale Operations (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Net Gas Utility Sales	54,187	46,725	30,466	23,196	22,792
Cost of Goods (Services) Sold	49,015	42,683	26,944	20,685	21,212
Gross Margin	5,173	4,042	3,522	2,511	1,580
Revenues in Excess of Variable Costs	6,541	5,274	4,475	3,220	2,246
Gas Delivered (millions of cubic feet)	18,193.5	15,983.7	11,791.4	10,253.4	10,328.6
Profit per Mcf	$0.284	$0.253	$0.299	$0.245	$0.153
Revenues in Excess of Variable Costs per Mcf	$0.360	$0.330	$0.380	$0.314	$0.217
$ Sales per Mcf	$2.978	$2.923	$2.584	$2.262	$2.207
Profit per $ Sales	$0.095	$0.087	$0.116	$0.108	$0.069
Return on Assets	15.3%	12.9%	13.4%	10.0%	6.3%

Table D-2
Composite Condensed Operating Statement
for Major Interstate Pipelines, 1979-1988

Total Utility
(millions of dollars)

Year	1979	1980	1981	1982	1983
Net Gas Utility Sales	29,359	38,265	46,465	56,203	56,792
Cost of Goods (Services) Sold	26,469	35,182	43,070	52,170	51,768
Gross Margin	2,890	3,083	3,395	4,034	5,024
Revenues in Excess of Variable Costs	4,040	4,312	4,824	5,669	6,799
Gas Delivered (millions of cubic feet)	31,198.6	32,416.1	35,661.3	35,133.2	31,814.8
Profit per Mcf	$0.123	$0.126	$0.124	$0.153	$0.211
Revenues in Excess of Variable Costs per Mcf	$0.172	$0.176	$0.176	$0.216	$0.286
$ Sales per Mcf	$1.253	$1.560	$1.699	$2.137	$2.390
Profit per $ Sales	$0.098	$0.081	$0.073	$0.072	$0.088
Return on Assets	12.3%	12.3%	11.3%	10.8%	12.1%

Table D-2
Composite Condensed Operating Statement
for Major Interstate Pipelines, 1979-1988

Total Utility (continued)
(millions of dollars)

Year	1984	1985	1986	1987	1988
Net Gas Utility Sales	56,102	48,992	33,457	26,704	26,739
Cost of Goods (Services) Sold	50,842	44,854	29,639	23,823	24,890
Gross Margin	5,260	4,138	3,817	2,881	1,849
Revenues in Excess of Variable Costs	6,992	5,793	5,445	4,360	3,400
Gas Delivered (millions of cubic feet)	34,745.0	33,194.7	29,493.3	32,115.7	34,934.2
Profit per Mcf	$0.206	$0.168	$0.178	$0.123	$0.071
Revenues in Excess of Variable Costs per Mcf	$0.274	$0.236	$0.254	$0.186	$0.131
$ Sales per Mcf	$2.199	$1.993	$1.563	$1.139	$1.027
Profit per $ Sales	$0.094	$0.084	$0.114	$0.108	$0.069
Return on Assets	13.2%	10.6%	10.7%	7.8%	4.8%