MARKET POWER ANALYSIS FOR THE OIL PIPELINE INDUSTRY

by

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Abstract: This paper presents a practitioner’s guide to applying for market-based rates in the US oil pipeline industry. The market power analysis presented represents my interpretation of “Market-Based Ratemaking for Oil Pipelines,” FERC Order No. 572, and is not official policy. If the Applicant is determined to have market power in either the origin or destination market on a segment of its pipeline, it is unlikely to be granted market-based rates. The Herfindahl-Hirschman index (HHI) serves as a first screen to measure market power. If the HHI indicates market power, then a second screen is applied to see if the Applicant is in a position to exercise market power. These include contracts, market shares, prorationing, alternative regulated pipelines, and so on. If the Applicant passes this second screen, then the granting of market-based rates is likely even if the HHI is high.

*The opinions expressed here are not official FERC policy.
I. INTRODUCTION

This paper presents a practitioner’s guide to applying for market-based rates in the US oil pipeline industry, providing a market power analysis consistent with the Federal Energy Regulatory Commission’s (FERC) Order 572.¹ This will be applied to the interstate oil pipeline industry, and specifically to refined petroleum products (RPPs) such as gasoline, diesel, and jet fuel. Market power is examined when an oil pipeline currently under regulation (the Applicant) seeks market-based rates.

The Applicant may seek market based rates on all or a subset of the markets served by its pipelines. Because monopoly at either end of the pipeline allows for full rent extraction, an analysis is required of both the origin market and destination market. The customers in the origin market are refineries or others seeking get product out of the market; the customers in the destination market are retail outlets seeking to get product into the market. To receive market based rates on a segment of pipeline, the competition in both the origin and destination markets must be sufficient to discipline the Applicant if it were to raise its transportation tariff under market-based rates.

Often there are intervenors in the application process, usually shippers over the pipeline, who also present analyses. FERC Staff then conduct their analysis, relying in part on the adversarial position of the Applicant and intervenors to provide the relevant information and insights to get closer to the truth.

The goal of this analysis is to develop a practitioner’s guide for applying for market-based rates in the US oil pipeline industry. If successful, then one could by

¹ Note that Order 572 is more general than the guide outlined here. Hence, this is my interpretation of Order 572, not official FERC policy, and the Commission may adopt an alternative methodology. This guide obviously does not bind the FERC to my interpretation of Order 572.
following these guidelines, prepare a market-based rate application for submission to the FERC. Each application has unique elements, and so many elements are discussed generally. Consultation of “Market-Based Ratemaking for Oil Pipelines,” FERC Order No. 572, the DOJ Guidelines, and publicly available applications for market-based rates should provide sufficient guidance for most applications.

II. MARKET POWER FRAMEWORK

The market power framework employed by the FERC is outlined in “Market-Based Ratemaking for Oil Pipelines,” FERC Order No. 572. It consists of five steps:

1. **product market definition**;
2. **geographic market definition**;
   - (a) identify facilities and services;
   - (b) identify the geographic market;
   - (c) identify good alternatives;
3. **market concentration analysis**;
4. identify **potential competition**; and
5. identify **other factors**.

The first and second steps lay the foundation for the market concentration analysis by defining what the product is and who is in the market. The third step examines measures of the Applicant’s market power. The fourth and fifth steps examine factors that might alter interpretation of the concentration measures.
Market power itself is defined as the ability to (1) profitably increase price (2) above the competitive level (3) for a significant period of time. If any condition fails, no market power exists.

Since pipeline transportation involves an origin and destination, both the origin and destination markets are considered. Since a monopoly at either end of the pipeline is sufficient to extract all rents, a finding of a competition in both markets is necessary. The origin and destination analyses are done independently, however, rather than simultaneously in a corridor analysis, however. That is, we do not examine only those competitors that serve both the Applicant’s origin and destination markets. Ignoring competitors serving only one of the markets leads to an understatement of the degree of competition in the market, since these competitors would also discipline the Applicant.

The remaining sections examine these steps in detail, first for the destination market (because that is somewhat easier) and then for the origin market.

III. DESTINATION MARKET ANALYSIS

A. PRODUCT MARKET DEFINITION

This discussion of market power analysis focuses on the U.S. oil pipeline industry, and specifically on RPPs. Hence, the relevant product market is defined as the pipeline transportation of RPPs per se; it excludes the RPPs themselves, and the trucking

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2 Further distinctions may be made, such as for specially reformulated gasoline required in some cites with air pollution problems.
necessary to get the RPPs from the pipeline terminal to the retail outlets. To avoid product differentiation problems, clear, unbranded gasoline may be used in the analysis.\(^3\)

The distinction between *transportation* (of RPPs) and the bundle (the delivered RPPs) is important, as transportation is examined for some purposes and delivered RPPs for others. *To compare disparate transportation alternatives, e.g.,* pipeline, truck, water, and various combinations, we examine the price of RPPs delivered to a destination (the delivered price). This serves as a common denominator. *To evaluate the exercise of market power,* on the other hand, we examine an increase in the Applicant’s transportation tariff. This evaluation of Applicant market power is done in terms of differences in delivered prices, that is, by adding the increase in the Applicant’s tariff to the delivered price.

Errors may arise in defining the geographic market and good alternatives if this distinction is ignored. The delivered price test is correctly based on the transportation tariff, rather than on the delivered price *used to compare alternatives.* Since the transportation tariff is approximately 1% of the delivered price, a threshold price increase (used to evaluate the hypothetical exercise of market power by the Applicant) based on the much larger delivered price allows uneconomic alternatives to the Applicant into the analysis. This suggests that the market is more competitive that it in fact is. The distinction between *transportation* (the product) and the *bundle* (to compare alternatives) is thus crucial.

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\(^3\) In some markets, reformulated gasoline is required for environmental reasons. This complicates the analysis by introducing product differentiation, making market comparisons difficult. This is not an issue in a destination market analysis, as all shippers must distribute the same reformulated gasoline. It is problematic in an origin market analysis, because the shipper can ship to different markets, and so different products are involved.
B. GEOGRAPHIC MARKET DEFINITION

We define the geographic market in three steps. First, we identify facilities and services of the Applicant and alternatives, and estimate the delivered price of the RPP from each terminal to each county in what is called a “basic economic area” (BEA). This serves as the starting point for defining the geographic market: FERC Order 572 states that “[t]he burden will be on the [Applicant] oil pipeline to explain why its use of BEAs or any other definition of the geographic market is appropriate” (p. 29). Second, we identify competitive alternatives to the Applicant, and estimate their delivered prices to each county. Third, a delivered price test is used to determine the counties (customers) that the Applicant can economically serve (addressing Order 572’s requirement that the Applicant explain its choice of geographic market), and the good alternatives within those counties.

The analysis is applied to markets individually. For example, if there were two origin markets and six destination markets, the analysis would be applied to eight individual markets. If the analysis revealed Applicant market power in one of the destination markets, the corresponding origin markets would be knocked out of the analysis, and similarly for the origin markets. In order for the Applicant to receive market based rates on a pipeline segment, both the origin and destination markets must be deemed competitive.

1. Identify Facilities and Services

The Applicant provides an inventory of the pipelines, terminals, local market consumption, waterborne transportation, and so on, serving a market. Local market

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4 A BEA is a basic economic area consisting of one or more metropolitan areas, and surrounding counties linked by commuting patterns. The U.S. is divided into 172 BEAs. (Kenneth P. Johnson, "Redefinition of the BEA Economic Areas," http://www.csus.edu/indiv/j/jensena/sfp/ca_desc.htm.)
consumption and waterborne transportation are also considered alternatives to the Applicant, though they are treated as a competitive fringe in the HHI measures. The Applicant should also indicate any prorationing (which reduces available pipeline capacity) and joint ownership (which reduces the amount of independently-owned pipeline capacity).

After identifying the geographic markets and good alternatives, the capacities of the Applicant and the alternatives are adjusted on the principle that any capacity in excess of market consumption will have no competitive effect (a firm cannot serve more than the entire market). Each firm is thus allocated the minimum of county consumption or its unadjusted capacity. These allocated county capacities are then aggregated across counties for each firm (they cannot exceed the firm’s actual capacity). These (aggregated) adjusted capacities form the foundation for this market power analysis.

A further adjustment is necessary in the presence of prorationing and joint ownership. Prorationing means that the demand for a pipeline capacity exceeds that capacity, forcing the pipeline to ration among customers. This reduces the capacity available, enhancing the Applicant’s market power. Since there is no unique way in which a pipeline must ration its capacity, adjustment must be based on the prorationing method adopted. Similarly, if a pipeline is jointly owned by two firms serving a market, the pipeline is allocated based on ownership shares to the capacities of the two firms.

2. The Framework: Delivered Price Analysis

A destination market analysis uses a delivered price test to determine the Applicant’s customers and the good alternatives to the Applicant. After a digression on
the delivered price analysis, it is applied to determine the Applicant’s customers and the good alternatives.

The analysis focuses on delivered price (the price of the bundle - RPP plus transportation) rather than on pipeline tariffs (the price of the pipeline transportation) per se. The Applicant’s competition comes in many varieties, and only delivered prices makes the varieties of competition comparable. In the simplest case, where alternatives have the same destination and origin markets, comparing tariffs is meaningful. Otherwise, they are not. Delivered prices convert an apples-versus-oranges comparison into an apples-versus-apples comparison. It does this by estimating the price of RPPs from any source delivered to a given destination. We can then, within the delivered price analysis, examine the Applicant’s potential to increase its tariff by examining the ability of the Applicant’s customers to chose alternatives (based on delivered price) to escape this tariff increase.

In practice we rarely face a situation where the Applicant and alternatives have the same destination and origin markets. Truckers distributing gas or diesel can buy from alternative pipelines, local refineries, or waterborne sources. Furthermore, alternative pipelines may: differ in length, involve segments owned by different parties, originate from or serve different locations, and so on. Similarly, local refineries may serve particular locations with or without pipelines, and also serve different locations. Hence, few if any alternatives to the Applicant are directly comparable, i.e., comparable using only pipeline tariffs. Even if some are directly comparable, excluding those that are not biases downward estimates of the degree of competition.
The delivered price itself is estimated as the terminal rack price plus the cost of trucking the product from the terminal to the county. Typically, Oil Price Information Service (“OPIS”) prices are used to determine the rack price for each supplier. The product is clear, unbranded gasoline. For each OPIS price market, which has multiple terminals, the average of a year’s worth of minimum daily prices is used as the rack price. If rack prices are not observed for a given terminal, the rack price from the closest observed OPIS market is used. The trucking cost component of delivered price has a fixed and a variable component (reflecting trucking distance from the terminal to the geographic county center). These are estimated from truck delivery data. They assume common fixed and per mile components (within each market) for all truckers reflects an assumed competitive trucking market.

The goal of delivered price analysis is to accurately identify the Applicant’s customers we seek to protect from tariff increases under market-based rates, and the good alternatives that can be expected to discipline the Applicant should it raise it rates. It starts with the BEA definition of the geographic market. It then identifies the Applicant’s customers (counties) based on whether the Applicant’s delivered price is competitive relative to those of alternatives. The delivered price method improves over selecting the market defined by the BEA. The BEA method may include counties to which the Applicant cannot competitively deliver RPPs, and so considers irrelevant customers; it may exclude other counties that the Applicant can competitively serve, and so ignores customers we seek to protect. Once we have the geographic market (the customers at risk) identified, we seek good alternative’s only for those counties.
3. **Determine Delivered Prices**

The terminal locations and trucking cost determine where the product may be economically sold. The current state of the art is to examine the geographic market at the county level. Hence, we will speak of the Applicant’s customers as the counties (for a destination market). For each Applicant terminal, we estimate the delivered price to each county in the BEA. Hence, if an Applicant has \( n \) terminals in a BEA with \( m \) counties, we estimate \( n \times m \) delivered prices. This process is repeated for the alternatives.

4. **Identify Applicant Counties**

Once we estimate delivered prices for the Applicant and alternatives, we then identify the relevant geographic market. To do this, we construct a supply curve based on delivered prices and capacities. First, we rank delivered prices from low to high. Second, we assign firms to the county until demand is satisfied by their capacities. Third, in order for the county to be an “Applicant county,” the Applicant must be one of the firms necessary to meet demand. If the Applicant cannot thusly deliver a competitive price to the county, the county is excluded from the analysis.

5. **Identify Good Alternatives**

We seek to identify alternatives to the Applicant so that, if it raises its tariff, its customers can turn to these alternatives, thus disciplining the Applicant. A good alternative is available, of comparable quality, and sells at approximately the same price as the Applicant. The criteria for selecting good alternatives is different from selecting Applicant counties.
a. **The Threshold Price Increase (TPI)**

We select good alternatives based on a TPI. A threshold price is the Applicant’s delivered price, plus an increase in the Applicant’s tariff under a hypothetical exercise of market power. This TPI is 15-30%, based on DOJ Guidelines.

Care must also be exercised so that the TPI is applied to the correct firm. Several possibilities exist. The TPI may be applied to the lowest delivered price, to the Applicant’s delivered price, or to the marginal firm’s delivered price. Since it is the Applicant’s exercise of market power that is of concern, the TPI is to be applied to the Applicant’s delivered price.

To illustrate the magnitude of this difference in the oil pipeline industry, note that pipeline tariffs are 1¢/gallon whereas the RPPs themselves are $1/gallon (these are only rough approximations for illustration). A 15-30% TPI applied to the tariff yields a 0.0015-0.0030¢/gallon increase, whereas 15-30% TPI applied to the delivered price yields a 15-30¢/gallon increase. Given that delivered prices are very close together, a 15-30¢ TPI will include many firms which are not competitive, overstating the degree of competition, and thus bias the HHI downwards.

b. **Delivered Price Test**

Once we have identified Applicant’s lowest delivered price (there may be multiple, as there may be multiple terminal serving a market), we apply the delivered price test. To do this, we compare the delivered prices of all alternatives against the Applicant’s threshold price. If an alternative’s delivered price does not exceed the threshold price, it is deemed a good alternative, and included in the analysis. Otherwise, it is excluded from the analysis of the market in question. The delivered price test thus
yields the set of alternatives capable of disciplining the Applicant under a hypothetical 15% or 30% tariff increase.

Note that, when identifying Applicant customers, we do not apply the same delivered price test as when good alternatives are identified. To do so introduces errors in identifying the geographic market because demand is ignored. For example, suppose that demand was very small, say the customer is a small rural county. An application of a delivered price test might allow the Applicant and many alternatives into the market. If many of the low-cost alternatives were more than sufficient to meet county demand, the Applicant would not be an economical supplier of the county, and yet the county included in the analysis.

C. MARKET CONCENTRATION ANALYSIS

1. Market Concentration Measures

After the geographic market (the collection of counties from within the BEA to which the Applicant is an economic supplier) and good alternatives therein are identified, the concentration analysis is applied. Three market power measures are used: the FERC and DOJ Herfindahl-Hirschman indices ("HHI"), effective capacity ratios, and Applicant delivery shares. The FERC and DOJ HHI constrain (in different ways) a firm’s effective capacity to be no greater than market demand.

The effective capacity ratio is the ratio of total effective capacity of all firms divided by total market demand. Intuitively, it indicates how many times total effective capacity can serve the entire market, and thus the potential of these firms to replace lost output if the Applicant reduces its output to try to raise price. Like the HHI, the greater is this ratio, the greater is the degree of competition likely to prevail in the market.
A delivery share is a market share based on deliveries of RPPs. A small delivery share, like a small capacity share, suggests a firm has little market power. Delivery shares differ from capacity ratios in that the former provides information about a firm’s ability to exercise market power whereas the latter provides information about the market’s ability to resist this exercise of market power.

The HHIs serve as the primary screen, with excess capacity ratios and delivery shares serving as secondary screens when the HHI suggests potential market power problems. A low HHI implies significant competition, as the largest firm has a small market share, and the presumption is that competition will effectively discipline any firm receiving market-based rates. A high HHI, on the other hand, implies that some firm(s) may be able to exercise market power acting alone. The HHI per se does not identify such firms, however.

The 1986 DOJ’s *Oil Pipeline Deregulations* report argues that a value of 2500 defines “high” (p. 30). That is, when the HHI exceeds 2500, anticompetitive concerns are significant, suggesting that continued regulation of the largest firms is appropriate. Ordinarily 1800 is the threshold cutoff, but due to the cost of regulation a higher HHI is tolerated.

2. **HHI Calculations**

Table 1 below illustrates the HHI calculations for a hypothetical destination market. Suppose that after applying the delivered price test, the Applicant and two alternatives are left serving the geographic market. Suppose that the three firms have unadjusted capacities of 100, 90, and 60, as shown in the second column. Suppose also that waterborne transportation has brought 20 additional units into the destination market,
which has a total consumption of 80 units. Since total consumption is 80 units, we adjust the Applicant’s and Alternative 1’s capacity to 80 units (suppose that no adjustment is necessary for prorationing and joint ownership). Suppose also that prorationing for Applicant 2 reduces its effective capacity to 20. These are shown in the “Adjusted Capacity” column.

The firm market shares are calculated based on the adjusted capacities. Total adjusted capacity is 200 units, leading to market shares of 40% for the Applicant and Alternative 1, and 10% for Alternative 2 and waterborne transportation. The last column presents the squared market shares. These are 1600 for the Applicant and Alternative 1, and 100 for Alternative 2. Note that, since waterborne transportation is considered a competitive fringe, its contribution to the HHI is ignored (although its contribution to total capacity is not). Finally, summing the squared market shares yields an HHI in this case of 3300.

Since this lies above the 2500 DOJ threshold for the oil pipeline industry, the presumption is that some firm in this market may be able to exercise market power, and so other factors must be considered. These other facts include the Applicant's market share, entry potential, and so on. Since the Applicant has a 40% market share, it is one of the largest firms in this market, and thus potentially able to exert market power.

Potential competition is that threatened by firms which, while not currently in the market, may enter after a relatively short period. The DOJ Guidelines defines potential entry as that which is timely (within a two-year period), likely (profitable), and sufficient to counteract the exercise of market power by incumbents (Section 3.0). Potential competition includes new capacity and pipeline conversion (from other products).
If we assume that the potential competition was insignificant (for convenience), then the Applicant in this market is likely to be deemed to have market power, and is unlikely to granted market-based rates. If the Applicant had a small market share, such as Applicant 2, then it would be more likely to be granted market based rates than in the example, as the potential exercise of market power would not be by the applicant.

Table 1. HHI Calculations for a Destination Market.

<table>
<thead>
<tr>
<th>Firm</th>
<th>Unadjusted Capacity</th>
<th>Adjusted Capacity</th>
<th>Market Share</th>
<th>Squared Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant</td>
<td>100</td>
<td>80</td>
<td>0.40</td>
<td>0.1600</td>
</tr>
<tr>
<td>Alternative 1</td>
<td>90</td>
<td>80</td>
<td>0.40</td>
<td>0.1600</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>60</td>
<td>20</td>
<td>0.10</td>
<td>0.0100</td>
</tr>
<tr>
<td>Waterborne</td>
<td>20</td>
<td>20</td>
<td>0.10</td>
<td>NA</td>
</tr>
<tr>
<td>Consumption</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>1.00</strong></td>
<td></td>
<td><strong>0.3300</strong></td>
</tr>
</tbody>
</table>

This process will be applied to each of the destination market for which the Applicant seeks market-based rates.

**IV. ORIGIN MARKET ANALYSIS**

In an origin-market analysis, we focus on the other end of the pipeline, on the shipper's ability to get RPPs out of a region. The market is still the transportation of RPPs. The transportation customer itself, *e.g.*, a refinery, defines the origin area. Transportation alternatives include local trucking, pipelines, and waterborne transportation serving a refinery. A netback analysis is used rather than a delivered price analysis, however. The difference derives from the fact that the customer in a delivered
price analysis is at the end of the pipeline whereas the customer in an origin market is at the beginning of the pipeline.\(^5\)

Netback analysis evaluates whether alternative shippers are sufficient to discipline the Applicant should it raise its tariff. Its application involves several steps. First, transportation alternatives are identified. Second, netback prices are estimated for each alternative. Third, good alternatives are selected based on a threshold price increase test. Fourth, HHIs are calculated and evaluated. Fifth, other factors are considered, such as the Applicant’s market share, that may alter interpretation of the HHIs.

Since this process parallels that of a destination market, the discussion will be condensed, except for significant differences in the analysis.

**A. PRODUCT MARKET DEFINITION**

The relevant product market is again defined as the transportation of RPPs. The distinction between transportation (of RPPs) and the bundle (delivered RPPs) remains in an origin analysis.

**B. GEOGRAPHIC MARKET DEFINITION**

Defining the geographic market in an origin analysis is simple, as it is usually simply a refinery that seeks to ship RPPs to various destination markets.

1. **Identify Facilities and Services**

In identifying the facilities and services of the Applicant and alternatives, often the same pipelines are involved as in a destination analysis, simplifying the work. This again involves correcting for prorationing, joint ownership, and so on that affects capacity or incentives to compete.

\(^5\)Extensions of the pipeline beyond the origin and destination points considered are ignored.
2. Estimate Netback Prices

The destination markets served by the various pipelines connected to the refinery determine the universe of markets available to the refinery. To evaluate the attractiveness of these markets to the refinery, and thus its options if the Applicant increases its tariff, we estimate the netback price associated with each market. Netback prices form the foundation for evaluating the potential extent to which the Applicant may exercise market power.

A netback price is the price a shipper receives for sale of its RPPs to a given market, measured at the refinery gate. That is, the netback price is defined as the rack price of the RPP net of transportation, terminalling, and other costs associated with transporting it to market. Because it guides a refinery’s selling decisions, netback prices are used to evaluate the competitiveness of alternatives.

As with a destination market analysis, netback prices, rather than tariffs, are compared to evaluate competition. The competition facing the applicant pipeline in an origin market comes in many varieties (truck, pipeline, water, and various combinations), and netback prices, like delivered prices, make all markets and modes of transportation comparable.

3. Netback Price Analysis

   a. Identify Refinery (The Geographic Market)

   In the origin market, the geographic market is determined by the location of the customer, usually a refinery. Hence, this step is trivial once the customer is identified.

   b. Identify Good Alternatives (The Competition)

      1. Estimate Netback Prices
Once all parties and markets are identified, we define the netback price as the OPIS rack price corresponding to each destination (or the closest OPIS market), less the corresponding FERC tariff from the refinery to the destination market.

2. The Threshold Price Increase

The netback price test performed in an origin analysis differs subtly from that in a destination market. The hypothetical market power experiment still has the Applicant raising its tariff by a 15% or 30% TPI. The threshold price is thus the rack price associated with delivery to one of the Applicant’s markets less the Applicant’s tariff and less the TPI.

The subtlety arises because we subtract the tariff increase from the netback price. Since we are examining tariff changes from the shipper’s perspective, a tariff increase reduces what the shipper receives. In contrast, a tariff increase increases what downstream customers pay, and is thus added to the rack price.

3. Netback Price Test

Once facilities and netback prices are determined, we perform the netback price test to identify good alternatives. The criterion for a good alternative mirrors that in a delivered price analysis: if an Alternative’s netback price as at least as large as the threshold price (the Applicant's netback price less the 15% or 30% hypothetical tariff increase), it is deemed a good alternative, and included in the analysis. Otherwise, it is excluded from the analysis of the market in question. The netback price test thus yields the set of alternatives capable of disciplining the Applicant under a hypothetical 15% or 30% tariff increase.
One complication relative to a destination market is that each pipeline may serve multiple destinations. Hence, multiple market power experiments must be conducted, one for each destination market served by the Applicant. We examine these hypothetical market power experiments in which the Applicant increases its tariffs one destination market at a time. For example, if the Applicant has two pipelines serving the refinery and serves ten markets, in principle all ten should be subject to an HHI calculation.

C. MARKET CONCENTRATION ANALYSIS

1. Market Concentration Measures

The same three market power measures are used: the FERC and DOJ Herfindahl-Hirschman indices ("HHI"), effective capacity ratios, and Applicant delivery shares. The HHIs, effective capacity ratios, and delivery shares are then calculated for each destination market served by the Applicant. If the HHI for each experiment is less than the 2500 DOJ threshold, then the Applicant is determined to not possess market power. Otherwise, other factors must be examined.

2. HHI Calculations

Table 2 below illustrates the HHI calculations for a hypothetical origin market, but only considers one destination market served. (Table 2 uses as much data from Table 1 as possible, to facilitate comparison.) Suppose that after applying the netback price test, the Applicant and two alternatives serve the refinery. Suppose that the three firms have unadjusted capacities of 100, 90, and 60, as shown in the second column. Suppose also that waterborne transportation ships 20 additional units out of the origin market, which has a total production of 80 units. One new factor in this analysis is local consumption, here 20 units. This represents another outlet for the refinery's production, and like
waterborne transportation, it is treated as a competitive fringe. Since total production is 80 units, we adjust the Applicant’s and Alternative 1’s capacity to 80 units (suppose again that no adjustment is necessary for prorationing and joint ownership). Suppose also that prorationing for Applicant 2 reduces its effective capacity to 20. These are shown in the "Adjusted Capacity" column.

The firm market shares are calculated based on the adjusted capacities. Total adjusted capacity is 220 units, leading to market shares of 36% for the Applicant and Alternative 1, and 9% for Alternative 2. Waterborne transportation, and local consumption. The last column presents the squared market shares. These are 1296 for the Applicant and Alternative 1, and 81 for Alternative 2. Note that, since waterborne transportation and consumption are considered as a competitive fringe, their contributions to the HHI are ignored (although their contributions to total capacity are not). Finally, summing the squared market shares yields an HHI in this case of 2673.

Since this lies above the 2500 DOJ threshold for the oil pipeline industry, the presumption is that some firm in this market may be able to exercise market power, and so other factors must be considered. These other facts include the Applicant's market share, entry potential, and so on. Since the Applicant has a 36% market share, it is one of the largest firms in this market, and thus potentially able to exert market power.

If we again assume that the potential competition was insignificant (for convenience), then Applicant in this market is likely to be deemed to have market power, and is unlikely to granted market-based rates. If, on the other hand, the Applicant’s market share was the 9% of Applicant 2, then its chances of receiving market-based rates would be improved considerably.
Table 2. HHI Calculations for an Origin Market.

<table>
<thead>
<tr>
<th>Firm</th>
<th>Unadjusted Capacity</th>
<th>Adjusted Capacity</th>
<th>Market Share</th>
<th>Squared Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant</td>
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<td>80</td>
<td>0.36</td>
<td>0.1296</td>
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<tr>
<td>Alternative 1</td>
<td>90</td>
<td>80</td>
<td>0.36</td>
<td>0.1296</td>
</tr>
<tr>
<td>Alternative 2</td>
<td>60</td>
<td>20</td>
<td>0.09</td>
<td>0.0081</td>
</tr>
<tr>
<td>Waterborne Production</td>
<td>20</td>
<td>20</td>
<td>0.09</td>
<td>NA</td>
</tr>
<tr>
<td>Consumption</td>
<td>20</td>
<td>20</td>
<td>0.09</td>
<td>NA</td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>1.00</td>
<td>0.2673</td>
<td></td>
</tr>
</tbody>
</table>

This process will be applied to each of the destination markets served by the Applicant from this origin market.

3. Identify Potential Competition

Finally, before pronouncing any of these destinations from the origin market uncompetitive, we examine other factors.

V. EVALUATING MARKET POWER

Finally, once we have evaluated the concentration measures and other factors, we are ready to combine the results.

A. Combining Origin & Destination Results

Since a monopoly at either end of the pipeline is sufficient to extract all of the monopoly rents, a finding of a competition in both markets is necessary. We thus examine all origin - destination pairs.
Figure 1 below illustrates for a simple case where the Applicant has one pipeline from the Origin Market to Destination Market #1. Reviewing the setup in terms if this figure, the Applicant serves one origin and one destination market. First, the Origin Market involves two potential destinations for the refinery, defined by the market served by the Applicant (Destination Market #1), and that served by Alternative Pipeline #1 connected to the Origin Market (Destination Market #2).

The destination analysis in this example involves one market, Destination Market #1, served by three pipelines: the Applicant, and Alternative Pipelines #2 and #3. Based on these three firms the HHI would be calculated.

The origin analysis in this example involves two markets, Destination Market #1 and #2, served by the Applicant and Alternative Pipeline #1. Based on these two markets, two HHIs would be calculated.

Then we put the two analyses together. In order for the Applicant to receive market-based rates on the pipeline for the Origin Market to Destination Market #1, the HHI must be below 2500 in both markets. If the HHI in each is below 2500, then the Applicant is likely to receive market-based rates. Failure in either market would, barring special considerations, may result in a rejection of the application for market-based rates.

Several factors might override a high HHI. First, a small market share by the Applicant indicates that it is not the firm likely to be able to exercise market power, as the high HHI is driven by another firm which is large. This should serve to discipline the Applicant (unless joint ownership or rationing are issues).
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