
ADMINISTRATIVE LAW AND REGULATION

GASOLINE, MARKETS, AND REGULATORS

By Andrew P. Morriss*

Does gasoline cost too much, or too little? Recently we have heard that gasoline costs too much. As gas prices soared in 2005, for example, the Sierra Club called on Congress to force prices lower and “put money back in the pockets of Americans who need it, not in the coffers of multinational oil companies.”¹ Prices that are “too high” are held responsible for everything from funding terrorism to pushing Americans into poverty. Yet, we also regularly hear that gasoline costs too little. In 2006, for example, *New York Times* pundit Thomas Friedman demanded a \$1/gallon tax to force gasoline prices high enough to make “the most promising alternatives—ethanol, biodiesel, coal gasification, solar energy, nuclear energy and wind” able to compete economically with gasoline.² Prices that are “too low” are alleged to be responsible for ills from suburban sprawl to global warming.

In a free market economy, the “too high” or “too low” debate would be easily settled. As Friedrich Hayek showed in his seminal article “The Use of Knowledge in Society,” markets compress considerable information into prices, enabling resource users and suppliers to make decisions without needing to know more than the price of a good.³ Prices do this by serving as signals about resource availability. When they rise, they signal increasing scarcity; when they fall, they signal greater abundance. Asking whether the price of anything is “too high” or “too low” is thus a meaningless question.

Unfortunately gasoline markets are buried in layers of regulation that obstruct the normal market processes that generate these signals to balance supply and demand. Because the aims of these regulations are often mutually contradictory, the impact of the thicket of regulation is even worse than first appears, distorting decisions on everything from the search for oil to investments in refineries. The legacy of more than a century of federal and state interference in market processes is that gasoline markets are vulnerable to price spikes and shortages. However, rather than prompting a public outcry to clear the thicket, these conditions inevitably trigger demands for yet more regulations to correct the distortions introduced by the earlier interventions. The current demands by politicians for windfall profits taxes, reductions in oil imports, increases in use of ethanol, and fuel economy mandates reflect their failure to fully understand the legacy of failed regulation that shaped today’s energy markets.

.....

* Andrew P. Morriss is the H. Ross & Helen Workman Professor of Law & a Professor of Business at the University of Illinois, and a Senior Fellow with the Institute for Energy Research in Houston, Texas. This article draws on *Market-Fragmenting Regulation* (with Nathaniel Stewart), 72 *BROOKLYN LAW REVIEW* 939 (2007) and *Why Gasoline Costs So Much: The Role of Markets, Regulation & Technology* (Yale University Press, forthcoming). Detailed citations for the information herein can be found in Morriss & Stewart, *infra*. Thanks to Jonathan Adler for comments.

When markets are allowed to work, the result has been substantial improvements in fuel quality and availability, demonstrating the costly nature of the persistent tendency toward intervention. One of the most dramatic examples of this comes from the earliest days of the American oil industry. The primary product from the first, simple “tea kettle” refineries was kerosene, sold for use in lamps and stoves. Gasoline was simply “the portion of crude petroleum too volatile to be included in kerosene” and early refiners “had no use for it and often dumped an accumulation of gasoline into the creek or river that was always nearby.”⁴ (Standard Oil even attempted to create demand for gasoline by marketing gasoline stoves.) With the appearance of the internal combustion engine, however, the waste product became a valuable commodity. By 1910, gasoline production exceeded kerosene production, and the refiners worried about a gasoline shortage, rather than how to dispose of the surplus gasoline. Similarly, when increasingly sophisticated cracking operations increased gasoline yields in the 1930s, byproduct gases that initially had no economic value and were disposed of by venting or burning also increased.⁵ The development of polymerization processes enabled refineries to turn these gases into octane-enhancing feedstocks, again converting a waste to a valuable product. As early as 1941, one technical review concluded that “[t]he constant practical application of chemical and engineering research to refining operations has resulted not only in improvement of products to meet changing conditions and requirements but in the reduction of waste in processing and in the manufacture of an almost infinite variety of products.”⁶ Refineries today continue to find ways to reduce costs by making use of waste products, and other improvements in product quality, including higher octane and more consistent properties, resulted from the relatively unregulated gasoline market of the late 1930s and early 1950s.⁷

As Congress, various state legislatures, and environmental regulators once again debate measures from outright price-controls to additional formulation requirements on fuels, it is useful to revisit past experiences with similar measures. This article unpacks the regulatory history of gasoline markets to shed light on the current policy debate. It first examines the competing and often contradictory policy goals invoked in regulatory debates, and then turns to the impact of the various policies on gasoline production. Finally the article suggests some paths out of the regulatory jungle and towards a regime that allows market forces to operate.

I. COMPETING POLICY GOALS PRODUCE RENT-SEEKING

Four policy goals compete for the attention of regulators whenever the subject of gasoline, or energy generally, is raised: anti-monopoly, restraint of “excess competition,” energy security, and environmental protection. That these goals often require contradictory measures has not prevented them

from being pursued simultaneously, rendering statutes in this area even more opaque than the average federal statute. Not surprisingly, all four of these policies often conveniently serve to mask rent-seeking by interest groups.

Concern over energy monopolies goes back to the beginning of the domestic oil industry and the attack on Standard Oil by both the federal and state governments. The conventional antitrust story is a familiar one: predatory monopolists or oligopolists conspire to raise prices above the competitive level, “gouging” consumers at the pump. Virtually every significant gasoline price increase prompts congressional and state legislative concern over energy monopolies. When these anti-monopoly concerns rise to the top of the legislative agenda, policies to restrict price increases appear, as they did in the 1970s under the Nixon-Ford price controls, and have again in recent proposals by several senators to allow “price caps” to restrain “gouging” by oil companies; (North Dakota’s Byron Dorgan is particularly active on this issue.)

When fierce competition appears in gasoline markets, however, governments do not rejoice, but instead focus their concern on restraining “excess” competition. This concern surfaced in the 1920s, for example, as new oil discoveries increased supply rapidly enough to push prices downward even as demand for gasoline grew as automobile ownership spread. Oil producers did not care for the resulting low prices and conservation groups worried that oil reserves were being depleted too rapidly. State efforts to limit production fell short and production continued to increase during the Depression years. In response, the Roosevelt Administration introduced measures to reinforce state-created production quotas and cartelize the same industry the federal government had so energetically sought to force to compete more vigorously just two decades earlier in the Standard Oil antitrust case. Similar concern that there is “too much” competition is invoked today by regulators bent on restricting the freedom of energy companies to control franchisees such as service stations as well as to justify production constraints on domestic oil producers and limits on imports.

Energy security issues, relating to ensuring adequate supply, also have a lengthy pedigree. They first surfaced during World War I, when the Navy sought secure domestic oil supplies for oil-fueled warships. They have also served to justify everything from the Mandatory Oil Import Program of 1959-1973 to the disastrous 1970s energy policies of Presidents Nixon, Ford, and Carter to current efforts to raise corporate average fuel economy (“CAFÉ”) standards. Energy security concerns usually motivate legislatures to demand differential treatment of at least some foreign sources of oil. They also serve as justification for a grab bag of policies that spring up in response to the distortions introduced by import restrictions.

Environmental concerns are of a more recent vintage. Restrictions on refinery location and operation, obstacles to new refinery construction, limits on pipeline routings, restrictions on drilling in sensitive areas (e.g. the Alaska National Wildlife Refuge), and fuel formulation requirements to reduce mobile source emissions (e.g. boutique fuels) are among the many policies justified by environmental concerns.

Different interest groups have different policy agendas. Pursuing a coalition to enact any given proposal thus can lead to provisions promoting conflicting policies. Thus in the Energy Policy and Conservation Act (EPCA) of 1975, Congress passed in an incoherent omnibus energy bill that “included provisions both to reduce and to raise the price of oil.”⁸ Most importantly, the regular reworking of regulations to emphasize first one policy and then another provides legislatures with almost continuous opportunities to serve special interests under the cover of advancing the policy concern of the moment.

II. THE IMPACT OF CHANGES IN CRUDE OIL PRICE & QUALITY

Today, roughly half the cost of a gallon of gasoline is the cost of purchasing the crude oil from which to refine it.⁹ Crude prices vary considerably depending upon world events that affect producing nations’ political stability, natural disasters that can temporarily shut down production, the discovery of new oil fields and the exhaustion of old ones, and the varying degree of OPEC members’ willingness to abide by the cartel’s efforts to limit production. As a result, much of the fluctuation in gasoline prices is caused by changes in crude oil prices.

Changes in crude markets have another impact that is increasingly important—oil production is shifting from “sweeter” crudes to more “sour” crudes.¹⁰ Many earlier major oil fields, such as those in West Texas and Iran were low in sulfur and other minerals (“sweet”), while many of newer major sources of oil, such as Alaskan North Slope crude and the Alberta tar sands, had more of these minerals (“sour”). This shift required refiners to make major investments to enable their refineries to process sour crudes. For example, investments in hydrotreating in the 1970s and 1980s allowed the Gulf Coast refiners to process cheaper, sour crudes but roughly trebled their capital expenditures.¹¹ Adding to costs, this trend toward sour inputs into refining coincided with increasing regulatory demands to tighten mobile source emissions standards in order to reduce sulfur in the fuels produced. The combination of these increased regulatory requirements for reduced sulfur in fuels and the high cost of upgrading refineries to handle sour crudes led many smaller refineries optimized for low sulfur crudes to shut down rather than incur the cost of modifications these two trends required.¹²

III. THE IMPACT OF CHANGES IN REFINING ON GASOLINE MARKETS

The first oil refineries were similar to whiskey stills, separating fractions of the oil by a simple distillation process. When this process yielded too little gasoline to satisfy the growing demand in the 1910s, refiners developed technological innovations such as thermal and catalytic cracking to break heavier hydrocarbon molecules into more desirable ones that could be used in gasoline. One example of technological progress shows how dramatically refining changed under demand pressures. In the early 1930s, the 100 octane reference fuel “was a rare chemical costing \$25 per gallon in the small quantities necessary for anti-knock testing purposes.” But by 1941, “the industry [was] manufacturing millions of gallons

of isooctane for use directly as aviation fuel at little more than 25 cents per gallon.”¹³ Today, the technology has advanced to the point that “[a]ny hydrocarbon can be converted into any other hydrocarbon by the appropriate application of energy, chemistry, and technology.”¹⁴

The result is that gasoline production has evolved into a complex process, built around production of a variety of specific chemicals from crude oil. These are then blended together to produce gasolines with specific performance and environmental characteristics. As the complexity of gasoline production has grown, so too has the scale of refining operations, with many refiners today operating networks of refineries as virtual single units to produce the needed proportions of each blendstock.¹⁵ An important consequence is that refiners’ investments in technology have soared in recent years.¹⁶ The payoff from this investment has been significant. U.S. gasoline production grew from 4.1 million barrels per day in 1960 to 8.3 million barrels per day in 2005.¹⁷

The expansion in capacity since the 1970s has come even as the number of refineries has declined. Indeed, no new “greenfield” refinery has been built in the United States since 1976, with capacity growth coming from the expansion of existing facilities and advances in technology that increase yields. One important reason for refiners’ decisions to increase the capacity of existing refineries rather than build new ones lies with regulatory policy. Price controls and quotas, discussed in more detail below, led to construction of numerous small, simple refineries in the 1960s and 1970s, primarily as a means to obtain valuable government permits that allowed importation of foreign oil and subsidies for small refineries. Those same programs also deterred consolidation in the refinery industry by reducing benefits when one refiner bought another. When price and allocation controls were ended by President Reagan in January 1981, the rationale for operating these small, inefficient plants evaporated and the number of refineries fell dramatically.

The investment necessary to expand capacity, process the increasingly “sour” crudes that make up oil production today, and produce fuels with the ever-lengthening list of characteristics demanded by regulators, is considerable. The need for such investments has made refining an increasingly capital-intensive business. In addition to the substantial investment required to build a modern refinery, regulatory hurdles have played a role in blocking new refinery construction. The only serious effort to build a greenfield refinery in recent years is Arizona Clean Fuels’ efforts to do so outside Yuma, Arizona and the story of the company’s efforts to date illustrates the obstacles faced by anyone contemplating building a new refinery.¹⁸ In 1999, Arizona Clean Fuels initially sought the permits necessary to build a \$2-3 billion refinery in Maricopa County, but the emissions restrictions and ozone noncompliance status in that location prompted the company to shift its plans to a remote location in Yuma County in southwestern Arizona. In addition to finding investors and a source of oil, the company had to procure “two dozen” local, state, and federal permits. Of course, obtaining the various regulatory approvals involved multiple public hearings and lengthy review by assorted governmental

bodies. More than seven years of regulatory efforts to date have cost the company over \$30 million without producing any physical steps toward construction. With such a record, it is little surprise that there have been few other efforts to build new domestic refineries. (There has been considerable investment in new ethanol plants, proving that politics can drive investment.)

IV. IMPORT RESTRICTIONS

When gasoline rationing ended after World War II, demand for gasoline soared. Refineries shifted from war fuel production to making automobile gasoline, but the growth in demand soon outpaced the growth in domestic refinery capacity. The General Agreement on Tariffs and Trade in 1947 led to reduced tariffs on both crude oil and refined products, allowing imports of both to grow to help meet the new demand. The subsequent increase in imports made the U.S. a net importer of oil for the first time in 1947. Soaring demand also led to higher gasoline prices, which induced increases in production capacity. Tax incentives for refinery projects, nominally motivated by national security concerns, also contributed to the boom in refinery expansion and construction, especially among small refiners. The result was the creation of “an intensely competitive industry” focused on “find[ing] ways of increasing efficiency and reducing operating cost.”¹⁹

One key response to this competition was that the major oil companies invested heavily in foreign sources, tanker fleets, shipping facilities, and coastal refineries, bringing cheaper crude to their U.S. refineries, and thereby gaining a major cost advantage over those domestic refiners that did not make such investments and remained reliant on higher cost U.S. sources of crude. Imports as a percentage of rising demand reached 18% in 1957, up from 11% just eight years earlier.²⁰

The rise in crude imports, expansion of refining capacity, and investment in infrastructure to expand the sources of crude were all responses to market conditions. Entrepreneurs identified opportunities, made investments and prepared to reap their rewards in the marketplace. These investments drove down gas prices through “hard competition.”²¹ Left alone, the interplay of market forces would have provided American consumers with more, better, cheaper gasoline. Unfortunately life is never that simple in the energy markets.

A. The Demand for Quotas

The rise in imports and the growing cost-advantage of the refiners who had access to cheaper foreign oil roiled domestic oil politics. Oil imports undercut the prorationing programs in oil producing states like Texas and Oklahoma, angering both American oil producers who found themselves cut out of markets and state regulators who resented their loss of control. The rise of imports should have surprised no one as it was the very success of the prorationing programs at raising domestic crude oil prices that drew the increasing amounts of foreign crude into the American market. Together with those refiners who had not invested in gaining access to foreign oil, the domestic oil producers and state regulators in the oil patch created a potent coalition to demand import restrictions. They

invoked anti-monopoly concerns (it was “Big Oil” that was doing the importing) and national security (dependence on foreign sources) to insist on restrictions on imports of foreign oil. The Suez Canal crisis in 1956 strengthened their position by highlighting the vulnerability of foreign supplies. In 1957, the Eisenhower Administration initiated a voluntary quota system for crude imports. The voluntary quotas failed to restrain imports, however. They failed, in part because of the enormous profits available from cheaper foreign oil,²² and, ironically, because the oil companies feared antitrust prosecutions if they cooperated.²³

When the economy weakened in 1958, domestic demand for crude fell while imports continued to increase, creating unstoppable momentum for mandatory import controls. Powerful Texas and Oklahoma politicians like Senate Majority Leader Lyndon Johnson, House Speaker Sam Rayburn, and Oklahoma Senator Robert Kerr, pushed hard to restrict imports to protect U.S. oil producers from price competition. Speaking directly to the major importers, Louisiana Senator Russell Long stated:

I believe your industry would make a great mistake not to realize that; as far as the government is concerned, as far as the fair treatment you are entitled to expect from your government is concerned, the people who will be your advocates are people who are very much interested in domestic oil... It is very much to your advantage to have a very healthy domestic industry and do everything within your power to cooperate to that end.²⁴

Facing such a line up, the Eisenhower administration abandoned its commitment to free markets and adopted controls.

B. Quotas in Practice

The quota system, known as the Mandatory Oil Import Program (MOIP), was in effect from 1959 to April 1973.²⁵ The MOIP became “the single most important energy policy in the postwar era.”²⁶ Unfortunately, it was a regulatory approach that resolutely ignored shifts in supply and demand. Rather than focusing on the economics of energy, the MOIP quickly became where a “roll call of the special interest groups in energy policy” found opportunities to profit at the public’s expense.²⁷ The MOIP also produced one of the most ironic unintended consequences of any federal program—concern over the impact of the program spurred Venezuela to convene the first meeting of the organization that eventually became OPEC.²⁸

Under the MOIP, refiners received permits to import crude oil, with the total amount allowed to be imported held below the amount that would have been imported in a free market. Allocations were adjusted based on “[r]efinery location, capital decisions, marketing arrangements and production and supply patterns” in attempts to achieve various policy goals and reward particular interest groups.²⁹ The result of the MOIP was that domestic crude prices were higher than they would have been in the absence of the quota system and the right to import the cheaper foreign crude attached to the quota “tickets” became valuable.

Moving from the market to politics had several important consequences for refiners. MOIP affected “virtually all major aspects of refinery operation—entry, plant siting, plant size,

merger and acquisition policy, product mix, and, of course, profitability.”³⁰ In refining, it “discouraged the expansion of domestic refinery capacity, altered refinery location within the United States, altered the mix of the final products, encouraged investment in cracking capacity, and discouraged investment in capacity to handle high-sulfur feedstocks.”³¹ The quota system failed to reward those oil companies that had invested heavily in foreign supplies, tanker fleets, and coastal refineries in anticipation of a growing reliance on imports. And MOIP quotas were valuable enough to affect refinery investment decisions, shifting construction from larger to smaller refineries because it rewarded each new refinery with a quota. Unfortunately, the new small refiners were often the least technologically sophisticated, and so later proved unable to handle the shift to sour crudes. The MOIP’s bias toward small refiners also discouraged consolidation of ownership in refineries, preventing buyouts of these refiners by the larger companies that could have increased efficiency.

The MOIP also produced extensive special interest lobbying. Refiners were allowed to trade their import quotas, and many inland and independent refiners did, using them to gain access to domestic crude owned by rivals.³² In many respects, therefore, the program was simply a transfer of wealth from the large, integrated oil companies to the smaller, inland refiners.³³ One academic review of the program concluded that, “[h]owever intricately wrought and carefully articulated the rationales for each action [under the MOIP], the impression was inescapable that the mandatory quota program was being treated as a source of unappropriated funds available for a variety of putative public purposes.”³⁴ The interest group maneuvering produced a program so complex that “[f]ew other regulatory schemes in America’s history can match the Mandatory Oil Import Program for labyrinthine complexity, or for the distortion of markets and interest-group dissension that it caused.”³⁵

One particular chain of distortions deserves extended discussion, because it illustrates particularly well how government interventions distort markets. Under the MOIP, every refiner received a share of the initial quotas, including the group of largely inland refiners who imported Canadian oil via pipeline. Of course, one of the major stated justifications for the MOIP was the national security concern over reliance on imported energy. Canada, joined by refiners using Canadian oil in the northern Midwest objected to the requirement of quota tickets for Canadian oil, pointing out that the oil came into the United States across a land pipeline from a close ally. The MOIP was accordingly modified to exempt Canadian oil imported via land. (The change left the Midwestern U.S. refiners using Canadian oil with surplus quota tickets, which they then sold to others for an added benefit.)

The exemption for Canadian oil provoked complaints from Mexico that its oil was disadvantaged. Mexican oil came to the United States via tanker in the Gulf of Mexico and so did not qualify for the overland exemption. Pointing to its friendly relations with the United States and the security of Caribbean shipping, Mexico asked for an exemption similar to Canada’s. Thus began one of the most vivid of the MOIP

distortions: the “Brownsville U-Turn” or “Mexican Merry-Go-Round.”³⁶ Through creative lawyering, and with the assistance of the State Department, a “crevice” in the import regulations was used to bring Mexican oil in as “overland” oil exempt from import quotas.³⁷

Mexican crude was moved by tanker from its producing regions to the U.S. port of Brownsville, Texas, on the Mexican border, unloaded in [customs] bond and then shipped into Mexico in trucks, which made a U-turn, and promptly reentered the United States. On reentry, the crude was taken out of bond, duty was paid on it, and it officially entered the United States under the overland exemption. Because a market for only a fraction of the Mexican oil existed in Brownsville, most of it was reloaded upon tankers and shipped to the East Coast U.S. ports as “domestic” oil.³⁸

This strategy boosted Mexican exports to the U.S. from 7,000 to 40,000 barrels per day.³⁹

Unsurprisingly, this special treatment of Mexican oil then provoked complaints from Venezuela, which produced heavy crude with a primary market in the United States. As a U.S. ally shipping through the secure Caribbean area, Venezuela felt it deserved the sort of special consideration received by Mexico and Canada. To satisfy Venezuela, the U.S. gave it a special deal on residual fuel exports. (“Resid” is a heavy fraction of crude oil.) This exemption “altered the product mix capability of domestic refineries and created a special dependence on imports of heavy fuels.”⁴⁰ Predictably, U.S. production of resid fell after 1960 from 332,200,000 barrels of production with 233,200,000 barrels of imports, a ratio of 1.42, to production of 257,500,000 barrels with 557,800,000 barrels of imports, a ratio of 0.46. The resid provisions encouraged utilities and industrial users in the northeast to favor resid over alternatives and domestic refiners to alter their production away from such products. Further suggesting the quota-driven nature of resid use, consumption declined after the MOIP ended, with natural gas and distillates taking its place.⁴¹

C. The Impact of Quotas

The period between the end of World War II and the end of the 1950s was an era of comparatively light regulatory intervention in U.S. energy markets. The result was a rapid improvement in the quantity and quality of fuel available in the American marketplace. U.S. refineries boosted output and increased the octane and consistency of the fuels they sold. Responding to shortages of cheap crude oil, energy companies made substantial investments in tanker fleets, pipelines, terminal facilities, foreign oil concessions, and refineries capable of handling new types of crudes, all of which benefited American consumers.

The creation of the MOIP in 1959 transformed business decisions in gasoline and oil markets into political issues where the profitability of investments would be determined by the grant of government privileges rather than by success in the marketplace. Instead of focusing on creating new business opportunities in the marketplace, “[b]usiness and government were preoccupied with the tactical issues of administering [policy]: import quotas and ‘prorating’ for crude oil.”⁴² This changed the refining landscape dramatically by preventing cheaper foreign oil from forcing down domestic oil prices and

driving marginal crude producers out of business. In refining, the MOIP’s microeconomic impacts included preventing the major international oil companies with access to foreign oil from gaining as much market share as they otherwise would have and allowing “several dozen, relatively inefficient independent refiners to stay in business.”⁴³

Not only did the shift of entrepreneurial energy from creating value in the market to mining the *Federal Register* for profits create absurdities like the “Mexican Merry-Go-Round” and blatant wealth transfers like the grant of quotas to non-importing refineries, it undermined the security of investments in refining capacity. For example, when oil companies raised the price of gasoline in February 1967, an unnamed administration official was quoted as saying that the government would flood the country with imported gasoline if the prices were not rolled back. Unsurprisingly, some prices were immediately reduced.⁴⁴ Such threats undoubtedly discouraged investment, a phenomenon that can clearly be seen in the decline of U.S. capacity relative to U.S. demand. Unlike in the 1950s, when domestic refinery capacity had exceeded domestic demand for refined products, refinery capacity between 1960 and 1970 increased at about half the rate of domestic product consumption, converting the U.S. from a refined product exporter to a refined product importer. The MOIP played a major role in this by encouraging the migration of refinery capacity to foreign locations.

V. PRICE CONTROLS

It is almost impossible to describe in less than a book-length manuscript the complex system of price and import controls imposed on energy in the 1970s during the Nixon, Ford, and Carter Administrations. These energy measures came about in part because, by the beginning of the 1970s, the cumulative impact of the various special interest exemptions granted under the MOIP had dramatically eroded that program’s effectiveness and oil imports had accordingly risen sharply. As a result, those who had benefited from the MOIP’s restrictions on imports were thus looking for an excuse to replace it with more effective controls. Moreover, when the federal government turned to wage and price controls, oil was critical to the price controls since it affected so many other prices. Rising oil prices in 1970 prompted the administration to investigate oil companies, Nixon himself to denounce the oil companies, and a relaxation of the MOIP quota restrictions to lower prices.⁴⁵

A. Imposing Price Controls

When voluntary measures proved insufficient to control inflation, Nixon imposed a general wage and price freeze on the entire economy from August to November 1971 (what came to be known as “Phase I”).⁴⁶ Of course, while the U.S. government was able to order domestic oil producers and gasoline sellers to freeze prices, its orders had no impact on world energy prices, and so the uncontrolled international price of gasoline and crude oil began to diverge from the controlled domestic prices, putting firms selling gasoline domestically made from imported oil at a severe disadvantage.

“Phase II” of the price controls, which lasted from

November 1971 until January 1973, limited wholesale price increases to no more than three percent annually.⁴⁷ In an effort to allow multiproduct firms, including refineries, some limited flexibility, special “Term Limit Pricing” (TLP) agreements were permitted. These allowed companies to meet the Phase II 3% rule by keeping the average of prices across products (rather than each individual price) within the guidelines. Politics kept gasoline, home heating oil, and residual oil off the list of commodities that could be included in the TLP agreements, however, and so refiners wishing to recoup the increased costs of imported oil had to do so through price increases for their other refined products. Several oil companies were told that a price increase for a ‘visible’ product would require public hearings and lead to protracted delays.⁴⁸ Thus even before the Arab oil embargo in 1973, price controls were having a major impact on gasoline markets by keeping prices artificially low and discouraging gasoline production. Shortages began to appear in late 1972 and early 1973, months before the Arab oil embargo.⁴⁹ Moreover, the differences in prices for crude from different sources created political pressure for a government allocation program to allocate access to cheap crude.

When the 1973 Middle Eastern war began in October 1973, approximately 17% of U.S. oil supplies derived from Arab sources.⁵⁰ The Organization of Arab Petroleum Exporting Countries halted exports to the United States and several other countries in retaliation for their support for Israel, exacerbating the already existing supply disruptions caused by the price controls. Although a bill creating an import allocation system was already moving toward passage in Congress before the embargo, the additional supply disruptions caused by the embargo provided the political excuse for controlling the distribution of both crude oil and refined products.⁵¹

Responding to the various interest groups’ demands, Congress quickly adapted the existing proposals into the Emergency Petroleum Allocation Act (EPAA) in 1973.⁵² The resulting rules were “almost unimaginably complicated and wide-ranging” and “[a]ll assessments of the period agree that, viewed *in toto*, these allocation regulations aggravated consumer suffering stemming from the embargo.”⁵³ For example, the federal government pressured refiners to produce more home heating oil at the expense of gasoline because it feared a shortage of the former in the next winter. But the government overestimated demand for heating oil and underestimated demand for gasoline, and so its intervention exacerbated gasoline shortages and produced a surplus of heating oil. The allocation system also “assured, perversely, that gasoline could not be shifted from an area already well-supplied to one where it was needed.”⁵⁴ In short, the federal response to the embargo eliminated the market’s ability to adjust, substituting an administrative allocation system that worsened the crude supply disruptions and limiting responsiveness through price controls. Yet, in response to each of these problems, the federal government regularly added additional controls. For example, when a tentative step toward decontrol in Phase III of the price controls in January 1973 produced a 7.4% rise in gasoline prices by March, controls were re-imposed on oil products.⁵⁵ Phase IV introduced a regulatory distinction between new and

existing sources of domestic crude and allowed higher prices for the former in an effort to boost crude supplies. While the oil price controls were supposed to end in 1974 along with the other “temporary” price controls, the Arab oil embargo’s price pressure led to an extension into the Mandatory Petroleum Price Regulations which continued them after the end of price controls generally.

With the Energy Policy and Conservation Act (EPCA) of 1975,⁵⁶ Congress revised the EPAA scheme in an incoherent omnibus energy bill that “included provisions both to reduce and to raise the price of oil.”⁵⁷ EPCA expanded the Phase IV pricing classifications as part of an effort to prevent “windfall” profits to domestic oil producers from the decontrol of “new” crude prices. The profits available from reclassifying oil into the market-price categories from the controlled price categories produced a number of successful schemes to do so. Economic analysts concluded that the EPCA created problems “infinitely worse” than the system it replaced.⁵⁸ And, in efficiency terms, the 1970s allocation program, under which the Federal Energy Administration set prices, was a step backwards from the MOIP, which had at least allowed the price of quotas to be set in the marketplace. As a result, “the Federal Register became more important than the geologist’s report.”⁵⁹

The regulations also created incentives to operate inefficient refineries simply to get the entitlements to crude oil that owning a refinery produced: “the result was the bringing out of mothballs any piece of ‘refining junk’ that could be found—leading to the return of hopelessly inefficient ‘tea kettle’ refineries of the kind that had not been seen since the flood of oil in the East Texas field in the early 1930s.”⁶⁰ Further modification of the program gave the small refiners additional entitlements based on a sliding scale in an attempt to reduce the cost advantages of the larger, more efficient refiners.⁶¹ As a result, smaller, less efficient refiners profited at the expense of larger, more efficient refiners, and additional new inefficient firms entered the refinery industry.⁶² The gains were substantial: \$17 billion in 1979.⁶³ And “[t]he prospect of a transfer of \$17 billion per year induces political competition for its acquisition among producers, refiners, and consumers. The entitlements program is an outcome of this process of competition and is the mechanism by which eventual ownership of the windfall gains that arise under crude oil price controls is resolved.”⁶⁴

When the Carter Administration took office, its initial policy goal was to find a way to decontrol domestic oil prices “so that consumers could react to correct price signals.”⁶⁵ However, Carter’s attempts to reform energy policy quickly became mired in special interest politics and decontrol proved elusive. As Daniel Yergin summarized, the Carter Administration got “a firsthand education in how special interests operate in the American system, including liberals, conservatives, oil producers, consumer groups, automobile companies, pro- and anti-nuclear activists, coal producers, utility companies, and environmentalists—all with conflicting agendas.”⁶⁶

Like Eisenhower and Nixon before him, Carter also attempted “voluntary” wage and price guidelines, “backed by moral suasion, publicity, and the denial of Federal contracts to firms that violated them. At least initially, this was taken to

include denial of the right to bid on Federal oil leases,” which induced “voluntary” compliance by many oil companies.⁶⁷ There is at least some evidence that these controls caused refinery-level shortages, and, because the price controls did not account for the interrelationships of products produced by refineries, they also produced shortages in non-controlled products.⁶⁸

B. Decontrol

When President Ronald Reagan decontrolled oil prices in January 1981, the rationale for operating small inefficient refineries dissipated and the number of refineries declined quickly and dramatically.⁶⁹ With deregulation, the oil industry went through “a wholesale corporate reorganization from which no major company was immune.”⁷⁰ Twenty-three small refiners shut down in 1981 alone.⁷¹ Falling real prices and the rise of institutional investors interested in rapid returns forced oil companies to become leaner and more profitable quickly.⁷² The shift from a regulatory program that encouraged a proliferation of refineries focused on domestic crude sources and kept small, less efficient refineries open, to a marketplace that punished inefficiency led many refineries to close in the 1980s.

VI. FORMULATION CONTROLS

Federal formulation requirements date to the removal of lead octane enhancers, a lengthy phase-out that began in the 1970s. Prior to that time, the formulation of gasoline had been left to market forces, which produced increased octane, engine performance enhancing additives, regional fuel variations that increased performance, and overall standardization of fuel quality.

Unsurprisingly, given the regulatory history in other areas, the lead phase out involved exemptions and preferences for small refiners. Between 1979 and 1982, “a small subindustry of ‘blenders’” firms known as “blenders” arose, “to take advantage of the small refiner exemptions.” These firms “would purchase inexpensive, low-octane gas from foreign markets and blend in just enough high-octane leaded gas to stay within the small-refiner exemption.”⁷³ Government involvement in formulation increased starting in the late 1980s, when both state and federal governments began to mandate various fuel characteristics to reduce air pollution emissions from cars. Restrictions on volatility were introduced for many areas in 1989 in an effort to reduce evaporation and the 1990 Clean Air Act Amendments added requirements for the addition of oxygenates to gasoline, nominally to reduce carbon monoxide emissions.⁷⁴ The requirement was promoted primarily by farm state representatives to boost demand for ethanol, however, and was not based on any serious scientific analysis.⁷⁵ Complying with the volatility, oxygenate, and sulfur requirements required significant capital investments by refiners.

In addition to federal formulation restrictions imposed by EPA, state and local governments have also imposed restrictions on gasolines sold in their jurisdictions.⁷⁶ Although there is no comprehensive list of formulations mandated by all levels of government, there appear to be at least seventeen different formulations—a major increase from the single standard (the lead standard) in place in the mid-1980s.⁷⁷ In addition, some state and local governments have imposed “biofuel” requirements.

The market-fragmenting nature of the various boutique fuel requirements is easy to grasp: by making gasoline sold in Phoenix different from gasoline sold in Tucson, boutique fuel requirements limit the depth of markets by preventing owners of Phoenix-formulated gasoline from selling their gasoline in Tucson and vice versa. The impacts of these requirements go well beyond these first order effects. The broader fuel formulation requirements also have an impact, however. The ultra-low sulfur restrictions all reduced refinery capacity by helping push marginal refiners out of the marketplace and raising the barriers to entry by increasing the capital requirements for refining.⁷⁸ Where additional capital investment is needed to produce the boutique fuels, the regulations limit the number of current plants able to produce a particular fuel, create incentives to exit boutique markets, and create barriers to entry into boutique markets. Econometric investigations into these requirements, comparing prices and price volatility between matched pairs of boutique and non-boutique cities, found that not only is there evidence that boutique fuel requirements raise the cost of gasoline, but that the price impact varies with the geographic isolation and degree of competition in the relevant market.⁷⁹ Boutique fuel requirements also result in increasing difference between U.S. market and non-U.S. market gasoline, thus limiting the possibility of importing gasoline from some foreign refineries and reducing the ability of those refineries to supply gasoline when there are spot shortages.

Perhaps the simplest way to grasp the impact of boutique fuel requirements is to think of operating a modern refinery as essentially solving a complex optimization problem. Refiners must find the solution that creates the highest value mix of end products by creating streams of intermediate products manufactured at different stages and blending them into final products. Boutique fuel requirements add additional constraints to the problem. If the constraints are binding, then they have costs.

VII. FRAGMENTED MARKETS & THE POLICY HORIZON

Energy policy debates generally treat gasoline as a fungible commodity, one widely traded in national and international markets. From the consumer point of view, this looks about right. You can fill up anywhere from pumps that look much the same from city to city and your car will run without noticeable differences in performance regardless of where you bought the gas. Unfortunately, the combined legacy of past energy policies means that gasoline markets are increasingly fragmented. The MOIP and 1970s price and allocation controls distorted the market by subsidizing inefficient refineries and maintaining isolated regional markets, thereby discouraging investment directed at broadening the markets. Worse, these programs rewarded rent-seeking, rather than exploration and innovation, pushing energy companies to divert resources to lobbying from providing energy to consumers. The periodic anti-monopoly campaigns against energy companies, relieved only by demands that they restrict “destructive” competition, periodically threw energy markets into turmoil. With the increasing number of boutique fuel formulation requirements was added to the policy mix, energy markets have begun to reach their breaking point.

Markets function best when they have many participants and the materials traded in the market are relatively standardized. This basic premise undergirds virtually all economic discussions of the efficiency of competitive markets. When markets become fragmented, they cannot function as effectively. Boutique fuel requirements reduce competition in regional markets. And the price spikes following the Gulf Coast refinery closures caused by Hurricanes Rita and Katrina demonstrated that our gasoline markets are vulnerable.⁸⁰

Energy policy is once again in the news and Congress is considering legislation in two areas that are likely to further damage energy markets. First, populist pressure is growing for measures to reduce energy company profits. Ignoring the importance of market signals for inducing investment and the disastrous history of price controls in the 1970s, a number of windfall profit tax and price control proposals have been filed. North Dakota Senator Byron Dorgan and Washington Senator Maria Cantwell have led the charge for measures to restrict “price gouging” by energy companies. They have done so despite the lack of evidence that inappropriate pricing practices exist, even after multiple Federal Trade Commission and other agency studies over the past decade. The lack of evidence does not mean there will not be action, however. When asked in 2005 if price gouging existed, for example, Senator Cantwell said “Absolutely. I just don’t have the document to prove it.”⁸¹

We know what price controls will do. They produce shortages. And shortages produce political pressure for more action. The history of the Nixon-Ford-Carter energy price controls, from Phase I to Phase IV to the EPAA and the EPCA demonstrates that. The only benefit of such controls is that they educate a generation about the irrationality of price controls, preventing their return for thirty years.

The second set of policy initiatives on the table are aimed at increasing government intervention into fuel production. These range from boutique formulation requirements that reduce emissions to expansion of ethanol requirements. The trend toward additional boutique formulations ignores three important facts about the state of the refining industry in America. First, refinery capacity is already strained by existing demand. The United States now imports significant amounts of gasoline from Europe (which has excess gasoline because of the greater reliance on diesel engines there.) As American gasoline specifications become more demanding, however, some of these refiners may opt to sell their excess gasoline to growing markets elsewhere (e.g. China), rather than invest in the equipment necessary to meet the U.S. boutique standards. Second, the combination of the increasing investment demands to meet the Clean Air Act’s requirements for refinery operations and the capital investment necessary to meet boutique standards crowds out investment in expanding capacity. Third, as the Arizona Clean Fuels’ experience shows, it is unlikely that major new refineries will be built anytime soon. As for the expansion of ethanol requirements, proponents promise both reduced emissions and increased energy security through reduced imports of oil and gasoline and reduced emissions. There are serious questions about the science behind both claims, however. Demands for increased ethanol usage (like boutique

requirements) distort energy markets by diverting investment into the production, distribution, and storage made necessary to keep specialized fuels separate and away from improving refineries’ net energy yields.

Unfortunately, it is unlikely that the politics of energy will shift in a market direction anytime soon. Given that, how can we escape the regulatory thicket? Three steps in particular would improve gasoline markets:

- *Streamline regulations that create barriers to entry.* Arizona Clean Fuel’s experience should be a wake-up call that regulations have created a virtually impenetrable wall around the refinery industry. We need more refining capacity and we cannot rely solely on expansion of existing facilities to get it. The dozens of permits necessary for permission to build a refinery could be reduced in number and complexity without sacrificing environmental protection.

- *Focus regulations on performance standards.* The refining industry has demonstrated enormous innovative ability over the past 100 years. It has dramatically increased octane, quantity, consistency, and efficiency of operation. A focus on performance rather than on fuel composition would create incentives to innovate in boosting environmental quality. (Of course, it would not necessarily increase corn prices as ethanol mandates do.)

- *Encourage cooperation between auto makers and gasoline refiners.* There is much we do not know about the fuel-engine interaction. There have been some preliminary efforts at cooperative research between the two industries, including the \$40 million Auto/Oil Air Quality Improvement Research Program that began in 1989. This effort demonstrated that the impact of the composition of gasoline varied considerably across vehicle types and ages.⁸² Unfortunately, such cooperation is limited by the energy companies’ well-founded fear of antitrust prosecutions. Encouraging such research through clear restrictions on antitrust actions against companies that undertake them could vastly expand our knowledge of how fuel composition affects the environment.

Despite a history of government intervention in pursuit of inconsistent policies and a burden of numerous complex regulations facilitating rent-seeking that few industries can match, Americans enjoy access to relatively inexpensive and convenient transportation fuels. To preserve that access, we need to address the fragmentation of gasoline markets before the next crisis creates political momentum for a twenty-first century version of the MOIP or the Nixon-Ford-Carter price and allocation controls that would irreparably damage the market structure.

- 65 YERGIN, *supra* note 21, at 663.
- 66 *Id.*
- 67 LANE, *supra* note 25, at 57-58.
- 68 Frank Camm, et al., *Resource Allocation under the COWPS Price Guideline: The Case of Fixed Proportions* vi-viii (1981) (Rand Corp. Report).
- 69 Exec. Order 12287, 46 Fed. Reg. 9909 (Jan. 30, 1981); U.S. Fed. Trade Comm'n, *Gasoline Price Changes: The Dynamic of Supply, Demand and Competition 51* (2005).
- 70 YERGIN, *supra* note 21, at 726.
- 71 2 BRADLEY, *supra* note 30, at 1237.
- 72 YERGIN, *supra* note 21, at 726-728.
- 73 Thomas O. McGarity, *Radical Technology Forcing in Environmental Regulation*, 27 LOY. L.A. L. REV. 943, 950 (1994).
- 74 42 U.S.C. §§ 7545(m), 7512a(b)(3).
- 75 Jonathan H. Adler, *Clean Fuels, Dirty Air*, in ENVIRONMENTAL POLITICS: PUBLIC COSTS, PRIVATE REWARDS 19, 28-37 (Michael S. Greve & Fred L. Smith, Jr. eds., 1992).
- 76 See U.S. Envtl. Prot. Agency, Reformulated Gasoline, *available at* <http://www.epa.gov/oms/rfg/faq.htm> (last visited May 18, 2007).
- 77 U.S. Senate, Comm. on Gov't Affairs, Majority Staff of the Permanent Subcomm. on Investigations, *Gas Prices: How Are They Really Set?* 94 (2002).
- 78 Nat'l Petroleum Council, *U.S. Petroleum Refining: Assuring the Adequacy and Affordability of Cleaner Fuels* 99 (2000).
- 79 Jennifer Brown, et al., *Reformulating Competition? Gasoline Content Regulation and Wholesale Gasoline Prices*, CUDARE Working Papers, No. 1010, at 4-5 (2006).
- 80 See Cong. Budget Office, *The Macro-economic and Budgetary Effects of Hurricanes Katrina and Rita: An Update* 19-20 (Sept. 29, 2005), *available at* <http://www.cbo.gov/ftpdocs/66xx/doc6669/09-29-EffectsOfHurricanes.pdf> (last visited May 18, 2007); U.S. Fed. Trade Comm'n, *Gasoline Price Changes: The Dynamic of Supply, Demand, and Competition* (2005).
- 81 Charles Pope, *Senators Condemn Oil Price 'Gouging.'* SEATTLE POST-INTELLIGENCER, *available at* http://seattlepi.nwsourc.com/local/239678_cantwell07.html (last visited May 18, 2007).
- 82 JOHN K. PEARSON, IMPROVING AIR QUALITY: PROGRESS AND CHALLENGES FOR THE AUTO INDUSTRY 87 (2001).

