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An Analysis of Gas Prices in America

Across the United States, gas prices have risen sharply within the past month. This shock stems from multiple factors including sanctions on Russia and the supply chain backlog. The price increases cause adverse effects to the supply chain and the economy. Firms, beset with high transportation costs, raise prices as consumers' purchasing power dwindles. The issue has reached the attention of policymakers, who are working to find a solution.

US Dependence on OPEC

Although the US does not rely on Russian oil, sanctions on Russia by the US and European Union limit the world oil supply. These limitations arise from how oil is bought and sold through a global commodities market, which is controlled by the Organization of Petroleum Exporting Countries (OPEC), a cartel of 13 oil-producing countries including Iran, Iraq, and Saudi Arabia (Pepitone). OPEC functions like a monopoly as it strategically sets quotas to maximize profits. As a collective, it agrees to produce at a profit maximizing quantity, pricing the product according to market demand. Each member's individual quota is the total quota divided by the number of nations (Carbaugh 253). Currently, the total quota is 400,000 barrels of oil per day, restricting each country to approximately 30,769 barrels. The quotas will remain in place until July 2022, impeding a supply increase (Reed). Therefore, supply remains constant as demand for oil increases, keeping prices high.

However, oil prices will eventually fall. The increase in demand incentivizes member countries to produce above the allotted quota. An individual member's profit maximizing

quantity differs from that of the cartel, allowing the member to earn greater profits (Carbaugh 253). Many member nations would cheat, causing supply to increase and prices to decrease. The reduction in price harms the cartel as a collective, but it benefits the supply chain as gas prices subside.

Why Isn't America Pumping More Oil?

During the pandemic, American demand for gas decreased as people stayed home, prompting oil producers to pause operations and lay off workers. Now that people are returning to work, demand for gas escalates, causing gas prices to increase. Domestic oil production, however, fails to keep up with the changing times. Oil production struggles to return to pre-pandemic production levels. In a speech on March 31, 2022, President Joe Biden openly criticized oil producers for "stockpil[ing] 9,000 [oil production] permits they aren't using" (Rapier). However, numerous factors impede progress within the oil industry.

The general supply chain backlog along with labor shortages create a bottleneck in ramping up production. Procuring oil is not as simple as "turning a spigot and watching oil gush out" (Cronin). Although oil producers have permits to drill oil on federal land, a shortage of capital and labor hinders production. Capital includes "materials like sand and steel," and labor is the manpower to operate the oil rigs. Production is limited, preventing firms from operating at its full potential.

In addition, investors are hesitant to invest in oil companies. Before 2014, the oil industry flourished until prices suddenly crashed, causing investors to lose major investments. Their hesitancy limits oil production from reaching its maximum output (Cronin). If the firms' desire is to improve technology to streamline oil procurement, they may be restricted by

investors' refusal to invest. The lack of investment prevents production with increasing returns to scale, which is essential to maximize output and revenue.

Impact on the Supply Chain and the Economy

The uptick in gas prices negatively affects the supply chain as transportation costs increase, impacting multiple economic sectors from retail to consumers. According to Total Reliance Logistics, spikes in fuel prices "increase the cost of freight transportation, which affects shipping companies and consumer shipping rates" (Langdon). In other words, shipping companies such as FedEx and UPS experience higher operating costs, so they add fuel surcharges. The surcharges are priced according to "diesel and jet fuel prices published by the U.S. Energy Information Administration (EIA)," which indicate price increases (Solomon). Shipping companies bequeath these costs to retailers, who recover the extra costs through greater consumer prices or delivery fees. As a result, consumers' quantity demanded for retail goods decrease.

Moreover, consumers spend a larger percentage of their income towards gasoline (Folger). They have less disposable income to spend towards retail goods, creating the income effect. Both the decrease in income and rise in prices cause consumers to spend less. Retailers struggle to break even due to the lack of purchases; they risk a shutdown or even bankruptcy. Underconsumption and the resulting shutdowns reflect an enervating economy, betokening a potential recession.

Increasing Airfare

Airlines bear the burden of high oil prices with the attainment of fuel being its largest operating cost. Fuel is a variable cost as it changes in relation to an airline's production level.

An increase in fuel prices augments the airline's average and marginal costs. Airlines will raise prices to recover lost profits, lowering quantity demanded for air travel (Diller).

However, demand for airline tickets is actually rising as "travel-starved consumers seem more than willing to pay up" after two years of the pandemic (Krauss). Due to higher demand, airfare increases as airlines "recaptur[e] a significant portion of the run-up in fuel." Nonetheless, airlines struggle to keep pace with demand as stockpiles of jet fuel diminish; they wait on expensive fuel that "jeopardiz[es] schedules [as] if there is a bad-weather event like a hurricane." Unless the fuel supply increases, airfare will continue rising. If the fuel supply shortage remains unsolved, demand for air travel will eventually subside, hurting the travel industry as a whole.

Effects on Rideshare Service

Rideshare companies also raise prices, adding fuel surcharges to compensate drivers for higher gasoline expenses. Starting in March 2022, Uber and Lyft have been charging a "55-cent fuel surcharge to each ride," which will "go directly to its drivers" (Franklin). While drivers are remunerated to pay for gas, 55-cents per ride barely cover costs considering that drivers only get "between 35 and 45 percent" of a ride's fee (Brown). Lane Allemond, an Uber driver, reports that the decreased base pay and the fuel surcharges only recover less than 8 percent of what he pays for gas each month. Allemond is one of many frustrated drivers suffering from price increases, struggling to make a living. In addition, the quantity demanded for rides decreases as the total fare is high. Drivers lose income as they lose customers, disincentivizing them from providing rideshare services. The existing driver shortage exacerbates as consumer prices increase (Allyn).

The driver shortage and increased fares cause decreased demand for rideshare services; the demand curve shifts leftward as consumers find it more convenient to drive than to wait for

an Uber. Consumers operate their personal vehicles, emitting more greenhouse gases; the gain in emissions represent the lost positive externality to the environment from suboptimal demand. Moreover, the supply of drunk drivers increases as less people use rideshare. The increased supply creates a negative externality as it endangers public roadways and victimizes innocent people.

Positive Effects on the Environment

Despite the negative economic impacts, increasing gas prices lessen humans' environmental footprint. According to columnist Jon Talton of the Seattle Times, high gas prices are "just what we need" to lessen greenhouse gas emissions, which are major contributors to climate change (Talton). A percentage of Earth's precious ozone layer is spared from depletion as oil supply is in a socially optimal position, mitigating the negative environmental externality. However, a slight supply decrease is insufficient to combat climate change. Talton states that we must reduce our dependence on cars by "funding transit and encouraging density, which are better ways to address global warming." By increasing public transportation options and containing urban sprawl, oil supply further decreases, alleviating the presence of harmful gases.

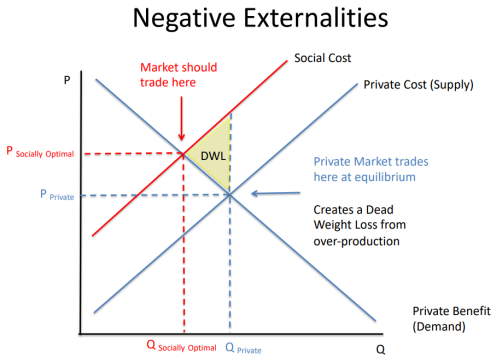

Figure 1: A graph depicting a negative externality (Bailly). The red line represents the socially optimal amount of supply. Due to the shortage of oil, supply has shifted to its socially optimal position, mitigating the negative externality (DWL).

A Temporary Solution

On Thursday, March 31, 2022, President Joe Biden ordered the release of 1 million barrels of oil per day from the US Strategic Petroleum Reserve. The White House describes this release as "unprecedented," as it "provide[s] a historic amount of supply to serve as [a] bridge until the end of the year when domestic production ramps up" (Franck). By releasing oil, the supply of gas instantly increases, decreasing the equilibrium price. Since this crucial decision, gas prices have been gradually decreasing across the United States, dropping below $4/gallon in some states (Hansen).

This solution is transient as US Oil Reserves will eventually be depleted. The amount of Russian oil exiting the market outweighs the world's reserves of oil. According to financial counselor Dan Gertrude, the release from the oil reserves is only "a Band-Aid solution" as it would only work in the short term (Mayer). Gertrude insists that the US must produce its own fuel to prevent another price increase; it is the only way for "supply to keep up with demand."

What's Next?

After announcing the release of oil reserves and ordering an increase in oil production, President Biden ordered the "promoti[on] [of] mining for the minerals and metals needed to produce electric vehicles – lithium, nickel, cobalt" (Roberts). By producing more electric vehicles, Americans' carbon footprint lessens. Increased production of electric vehicles is a solution to eliminate the negative externality created from gas emissions. Biden's order shows that he is committed to lessening the country's reliance on gasoline.

Environmentalists feel that the Biden administration needs to "hasten [the] energy transition" to renewable resources. Professor Maria Ivanova feels that while releasing oil reserves is a necessary solution, the US needs to view the crisis as "a clear sign that we cannot

depend on oil and gas exclusively, on fossil fuels exclusively. There is a clear need for renewable energy – wind and solar" (Roberts).

Nonetheless, the US will continue to rely on oil as an energy source. To exclusively transition to electric vehicles is not an economically efficient decision. Increasing the supply of electric vehicles will take time, leaving the "sticker price in the $40,000 to $45,000 range" (North 146). Governments end up subsidizing buyers, leading to a loss of economic welfare. While society should promote fuel efficiency, we must continue to pump oil to ensure our nation's energy independence and to help the economy recover.

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