Analysis of Oil Prices since 1974

Sam O'Connor

3 May 2024

1 Abstract

This report looked at the price of a crude oil barrel every month from January of 1974 to December of 2023. Crude oil prices are somewhat volatile due to how much they are affected by geopolitics. Instead of looking at the raw numbers for every month, the average yearly prices were found and then plotted. This analysis was done through python, with help from the numpy and matplotlib python packages. Python is a strong tool for data analysis due to the variety of available packages, its open-source nature, and the wide number of available resources to help people in their goals for a project. The steps for the analysis here will be explained throughout this text. The report analysis was focused on the causes for the spike in oil prices from 1978-1980, specifically the Iranian Revolution which started in 1978. A simple graph of something like oil prices can seem uninteresting at face value but it can often be representative of larger world events if some time is taken to really dig into the reasons for why changes happen when they do. It also shows how python is not strictly limited to STEM applications, but can also be used to help our understanding of things like history, sociology, and economics.

2 Introduction

Have you ever been frustrated at the price of gas? Cars are an integral part of most people's lives, especially in the United States, so it makes sense that people feel strongly about the price of gas. Gas is not the only product affected by the price of crude oil, but it is the one that most people probably think of when they hear "crude oil." Crude oil is one of the most important commodities in modern society and its price is tied to a large number of factors. Oil is collected from many locations around the world and whenever major events happen in these locations, it can shift oil production rates which in turn affects the price of oil. This report will explain how this crude oil price data was collected, what it actually means, how it can be visualized, and how trends in the data can be explained by real-world events with a specific example.

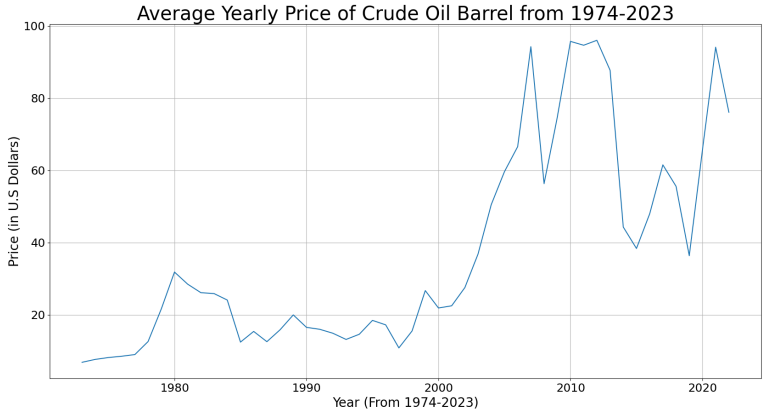

Figure 1: This is the graph of average Crude oil barrel prices. It was made using the modified lists of data and pylab

3 Data and Visualization

The original data used in this report was the monthly price of crude oil per barrel from 1979 to 2023. It was from the U.S Energy Information Administration. [1] In its original state it was interesting but was such a large amount of data that it was condensed before getting plotted. This was done by first uploading a text file copy of the information to a WSL directory. From there it was read with "open()" and "readlines()" commands. From there, the information on lines could be split and put into two lists, one for years and one for prices. To further analyze the price data, another step had to be taken because its base state it was just regarded as strings by python which cannot be treated as normal numbers.

The price list containing strings was modified with a for loop to change it into a list of floats. This newly modified list was then separated every 12 values to find the yearly price averages. These yearly price averages were put into a new list which was then graphed.

Figure 1 was made by taking the yearly price averages and putting them in for the y values of the plot. The x values were taken from the year list that was made from the original plain text file. This was done using pylab. Effective Computation in Physics was helpful for doing this. [3]

4 Data Analysis

As can be seen in the figure 1, there was a sharp increase in the price of crude oil in the late 1970s. [2] This is specifically known as the 1979 oil crisis and it happened because of the Iranian Revolution which started in 1978. Iran was and continues to be one of the largest oil producing countries in the world. During the revolution there, oil workers went on strike which led to a 7 percent drop in global oil production which made the price of crude oil increase dramatically. From 1979 to 1980, the price of a barrel of crude oil had more than doubled which had ripple effects on other countries. [2] For example, gasoline is one of the most used products that can be made from crude oil so there were gas shortages in the U.S. due to the lower amounts of oil. Public fears of completely running out of gas led to somewhat of a panic where people tried to buy more gas than they needed which made the problem even worse.

This had further effects on major elections and on the development of oil production. Oil was sought out from other regions and production increased until the mid 1980s when the trend had completely reversed itself and there was actually an overabundance of crude oil. [2]

References

[1] U.S. Energy Information Administration. U.s. crude oil first purchase price, 2024. `https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=f000000__3&f=m`.

[2] Samantha Gross. What iran's 1979 revolution meant for us and global oil markets, 2019. `https://www.brookings.edu/articles/what-irans-1979-revolution-meant-for-us-and-global-oil-markets/`.

[3] Anthony Scopatz and Kathryn D. Huff. *Effective Computation in Physics: Field Guide to Research with Python*. O'Reily, 2015.