Assignment 4: Becoming an Independent Data Scientist Example Solution

1 Region and Domain

State the region and the domain category that your data sets are about.

Saudi Arabia & Russian Federation.

Conventional Crude Oil Production and Exports

2 Research Question

You must state a question about the domain category and region that you identified as being interesting.

A measurement and visual comparison of conventional crude oil exports and the interplay of dominance between two major crude oil producers, Saudi Arabia and the Russian Federation over the last 41 years.

3 Links

You must provide at least two links to publicly accessible datasets. These could be links to files such as CSV or Excel files, or links to websites which might have data in tabular form, such as Wikipedia pages.

**Dataset download** :

<https://docs.google.com/spreadsheets/d/1HALr0edOnqzZFrIaZ93NC4B0GKPIR78K/edit?usp=sharing&ouid=107519738176983952065&rtpof=true&sd=true>

**Source of data set** : Oil trade, Table 5.2: World crude oil exports by country

https://asb.opec.org/data/ASB\_Data.php

4 Image

You must upload an image which addresses the research question you stated. In addition to ad- dressing the question, this visual should follow Cairo’s principles of truthfulness, functionality, beauty, and insightfulness.

5 Discussion

You must contribute a short (1-2 paragraph) written justification of how your visualization addresses your stated research question.

1) The visualization shows the comparisons of increase and decrease in oil export dominance for Saudi Arabia versus the Russian Federation over 4 historical distinctive periods, namely pre 1980, 1985, 1990 and 2021. Oil production and export data for both countries were obtained from Opec.org.

2A) The 1970’s oil crisis occurred when the Western World faced substantial petroleum shortages and elevated prices. Due to the 1973 oil crisis and the 1979 energy crisis, respectively the Yom Kippur War and the Iranian Revolution triggered disruptions in Middle East oil exports. This led to the price of oil and exports for Saudi Arabia to peak in 1980.

2B) The 1980’s oil glut was a surplus of crude oil caused by falling demand and slowed economic activity in industrial countries. This led to the eventual price decline and Saudi Arabia’s exports to bottom in 1985.

2C) In 1986, Saudi Arabia discontinued selling oil at official prices and recaptured significant market share from the rest of OPEC. By early 1990, Saudi Arabia’s refusal to restrict quota production levels with Kuwait and UAE led to overproduction that contributed to mounting inventories. Relatively, the collapse of the Soviet Union coincided with the dramatic collapse in their oil sector. By 1996, production was down to 47% below its peak level.

2D) In 2019, Saudi Arabia’s oil exports dropped by 10.75% year on year. Half of oil production went offline following a surprise drone strike by the Houthi rebels backed by Iran. Into 2020, Saudi Arabia and Russia dealt with the ‘black swan’ oil demand slump in China due to the coronavirus outbreak.

The slowdown in China’s industrial activity caused the worst shock to oil demand in over a decade.

Inefficiencies inflicted by Soviet production methods, a severe collapse in investment spending and restrictions on foreign companies willing to undertake Russian oil projects contributed to the collapse.

\* in regards to Cairo's principle of truthfulness, only data that was needed was utilized.

\* in regards to Cairo's principle of beauty, a grid with very light colored lines and a mild color scheme was implemented for visual effectiveness.

\* in regards to Cairo's principle of functionality, implementation of data interactivity with mplcursor function allows the end user to identify any interesting data points with clarity.

\* in regards to Cairo's principle of insightfulness, a minimalist approach for a clean visualization and information was the key approach for the presentation of the research topic and findings.