Gasoline Prices in Mexico[1]

Fuel Price Fluctuations, A Constant Concern

Jesus L. Monroy

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[1]This article is based on a dataset provided by Fernanda Chavarria

Abstract

Gasoline prices in Mexico are a complex issue influenced by various factors. In this article we examine the gasoline prices in the 32 States that constitute Mexico and also their differences in cost, sale price and profits. Challenges remain in stabilizing prices and mitigating the impact on consumers and the economy.

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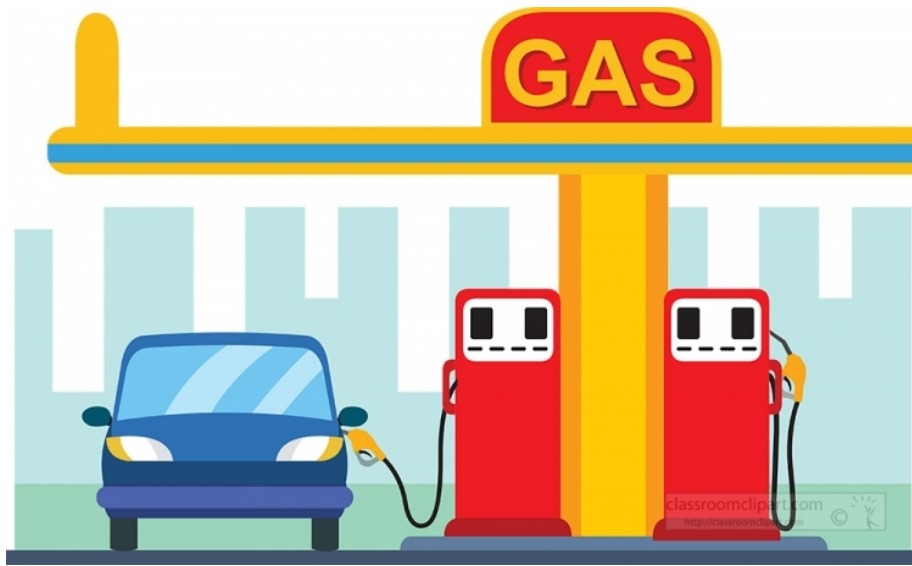# List of Figures

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Figure 1: Gas Prices in Mexico Report

Overview

Current Situation

- **Rising Prices**

Despite government efforts to stabilize fuel costs, gasoline prices in Mexico have been on the rise. Some estimates suggest prices could reach MX$30 per liter during 2025.

- **Regional Variations**

Gasoline prices vary significantly across different states in Mexico. Quintana Roo has the highest average price for regular gasoline, while Veracruz has the lowest.

- **Government Intervention**

The government has implemented measures like a price cap of MX$24 per liter for regular gasoline and has been working to stabilize fuel prices. However, these efforts have faced challenges.

Factors Affecting Prices

- **Global Oil Prices**

International oil prices play a significant role in determining gasoline prices in Mexico.

- **Government Policies**

Taxes, subsidies, and regulations implemented by the Mexican government influence fuel prices.

- **Economic Conditions**

Inflation, exchange rates, and other economic factors can impact gasoline prices.

Challenges and Concerns

- **Impact on Low-Income Families**

Rising gasoline prices put a strain on low-income households, affecting their daily expenses and overall economic well-being.

- **Economic Impact**

Increased fuel costs can have a ripple effect across various sectors of the economy, potentially leading to inflation and affecting businesses.

- **Government Promises**

The government's promises to keep gasoline prices low have been met with skepticism, as prices continue to climb.

Environment settings

Import libraries

```
import polars as pl
import duckdb as db
from plotnine import *
```

Connect to database

```
conn = db.connect('data/my_database.db')
```

Create dataframe

```
df = conn.sql('select * from gas_stations').pl()
```

Close database connection

```
conn.close()
```

Table overview

```
df = (
    df.select('entidad'
              , 'municipio'
              , 'precio_tar'
              , 'precio_vendedores'
              , 'ganancia')
        .rename({
            'entidad':'state',
            'municipio':'municipality',
            'precio_tar':'gasoline_cost',
            'precio_vendedores':'sale_price',
            'ganancia':'profit',
        })
).with_columns(
    (pl.col('profit')/pl.col('gasoline_cost')).alias('profit%'),
    mun_state=pl.col('municipality')+', '+pl.col('state')
)
```

```
(
    df.select(pl.exclude('mun_state'))
        .to_pandas()
        .head()
```

```
        .style
        .hide()
        .format({'gasoline_cost': '${:,.2f}',
                'sale_price': '${:.2f}',
                'profit': '${:.2f}',
                'profit%': '{:.2%}',})
)
```

Table 1: Dataset preview

state	municipality	gasoline_cost	sale_price	profit	profit%
CHIHUAHUA	JUAREZ	$21.63	$23.31	$1.68	7.76%
COAHUILA DE ZARAGOZA	SABINAS	$21.63	$23.31	$1.68	7.76%
COAHUILA DE ZARAGOZA	TORREON	$21.63	$23.31	$1.68	7.76%
DURANGO	GOMEZ PALACIO	$21.63	$23.31	$1.68	7.76%
NUEVO LEON	ABASOLO	$21.63	$23.31	$1.68	7.76%

```
print(f'The working dataset has {df.shape[0]:,.0f} rows')
```

The working dataset has 1,917 rows

Group data by State

```
states = (
        df.group_by('state')
            .agg(pl.col('gasoline_cost','sale_price','profit', 'profit%').mean())
            .sort('state')
        )
```

Group data by municipality

```
municipalities = (
        df.group_by('mun_state')
            .agg(pl.col('gasoline_cost','sale_price','profit','profit%').mean())
            .sort('mun_state')
        )
```

Top 05 States with highest gasoline prices

```
(
    states
        .top_k(5, by='sale_price')
        .to_pandas()
        .style
        .hide()
        .format({'gasoline_cost': '${:,.2f}',
                 'sale_price': '${:.2f}',
                 'profit': '${:.2f}',
                 'profit%': '{:.2%}',})
)
```

Table 2: Top 05 States with highest prices

state	gasoline_cost	sale_price	profit	profit%
QUINTANA ROO	$21.46	$24.80	$3.34	15.55%
YUCATAN	$21.46	$24.79	$3.33	15.52%
NAYARIT	$22.54	$24.76	$2.23	9.90%
GUERRERO	$22.37	$24.76	$2.39	10.67%
SINALOA	$22.36	$24.72	$2.36	10.59%

Top 05 States with lowest gasoline prices

```
(
    states
        .bottom_k(5, by='sale_price')
        .to_pandas()
        .style
        .hide()
        .format({'gasoline_cost': '${:,.2f}',
                 'sale_price': '${:.2f}',
                 'profit': '${:.2f}',
                 'profit%': '{:.2%}',})
)
```

Table 3: Top 05 States with lowest prices

state	gasoline_cost	sale_price	profit	profit%
TAMAULIPAS	$21.22	$23.10	$1.87	8.79%
COAHUILA DE ZARAGOZA	$22.25	$23.12	$0.87	4.01%
CHIHUAHUA	$21.47	$23.36	$1.89	8.90%
NUEVO LEON	$21.41	$23.40	$1.99	9.32%
VERACRUZ DE IGNACIO DE LA LLAVE	$21.59	$23.44	$1.86	8.62%

Top 05 Municipalities with highest gasoline prices

```
(
    municipalities
        .top_k(5, by='sale_price')
        .to_pandas()
        .style
        .hide()
        .format({'gasoline_cost': '${:,.2f}',
                 'sale_price': '${:.2f}',
                 'profit': '${:.2f}',
                 'profit%': '{:.2%}',})
)
```

Table 4: Top 05 Municipalities with highest prices

mun_state	gasoline_cost	sale_price	profit	profit%
NUEVA ITALIA, MICHOACAN DE OCAMPO	$22.52	$25.17	$2.65	11.78%
ZIRACUARETIRO, MICHOACAN DE OCAMPO	$22.52	$25.17	$2.65	11.78%
GABRIEL ZAMORA, MICHOACAN DE OCAMPO	$22.52	$25.17	$2.65	11.78%
HUIRAMBA, MICHOACAN DE OCAMPO	$22.52	$25.17	$2.65	11.78%
NAHUATZEN, MICHOACAN DE OCAMPO	$22.52	$25.17	$2.65	11.78%

Top 05 Municipalities with lowest gasoline prices

```
(
    municipalities
        .bottom_k(5, by='sale_price')
        .to_pandas()
        .style
        .hide()
        .format({'gasoline_cost': '${:,.2f}',
                 'sale_price': '${:.2f}',
                 'profit': '${:.2f}',
                 'profit%': '{:.2%}',})
)
```

Table 5: Top 05 Municipalities with lowest prices

mun_state	gasoline_cost	sale_price	profit	profit%
ANAHUAC, NUEVO LEON	$20.57	$20.74	$0.17	0.84%
CD. GUERRERO, TAMAULIPAS	$20.57	$20.74	$0.17	0.84%
LAMPAZOS DE NARANJO, NUEVO LEON	$20.57	$20.74	$0.17	0.84%
ALLENDE, COAHUILA DE ZARAGOZA	$22.59	$21.02	$-1.57	-6.94%
MORELOS, COAHUILA DE ZARAGOZA	$22.59	$21.02	$-1.57	-6.94%

Average Gasoline Price by State

```
(
    ggplot(states, mapping=aes(x='state', y='sale_price'))
        + geom_bar(stat='identity', fill="#4c72b0")
        + coord_flip()
        + scale_y_continuous(limits=(0, 25))
        + labs(x='',
               y='gasoline_cost')
        + theme(axis_text_y=element_text(rotation=0),
                figure_size=(5.8, 4.5),
                panel_background=element_line(color='#f6f6f6',)
                )
)
```
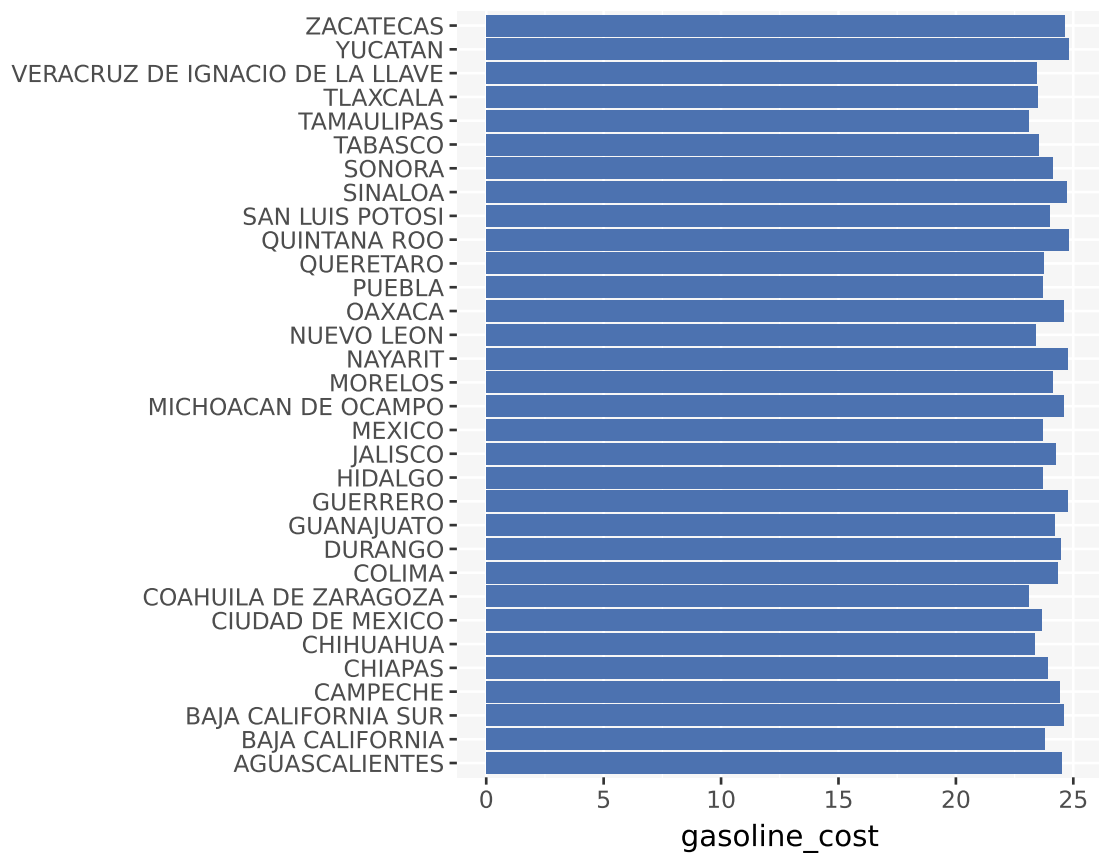

Figure 2: Average Gasoline Prices by State

Profit by State

```
(
    ggplot(states, mapping=aes(x='state', y='profit'))
        + geom_bar(stat='identity', fill="#800020")
        + coord_flip()
        + scale_y_continuous(limits=(0, 3.4))
        + labs(x='',
               y='profit')
        + theme(axis_text_y=element_text(rotation=0),
               figure_size=(5.8, 4.5),
               panel_background=element_line(color='#f6f6f6',)
               )
)
```
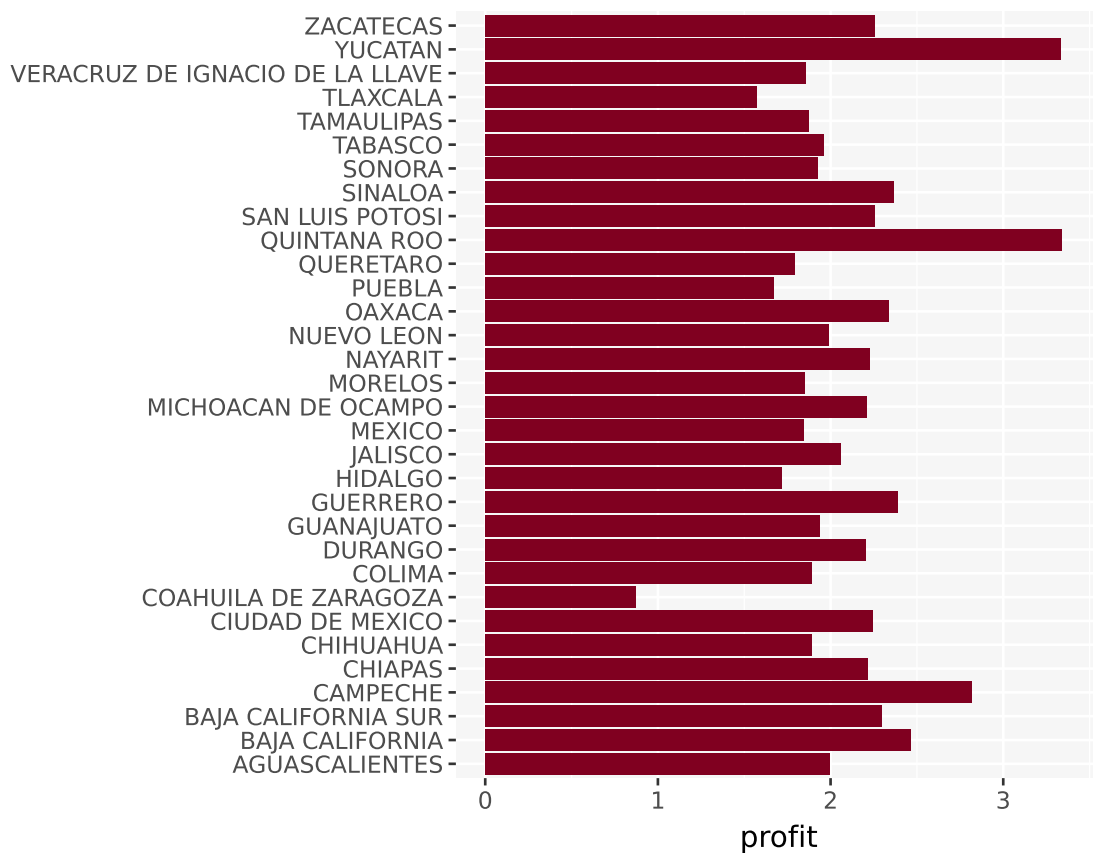

Figure 3: Profit by State

Dispersion of Gasoline Prices

```
(
    ggplot(data=df, mapping=aes(x='state', y='sale_price', fill='state'))
    + geom_boxplot()
    + coord_flip()
    + scale_y_continuous(limits=(20, 25.9))
    + labs(x='',
           y='gasoline_cost')
    + theme(legend_position='none',
            figure_size=(5.8, 4.5),
            panel_background=element_line(color='#f6f6f6',)
            )
)
```
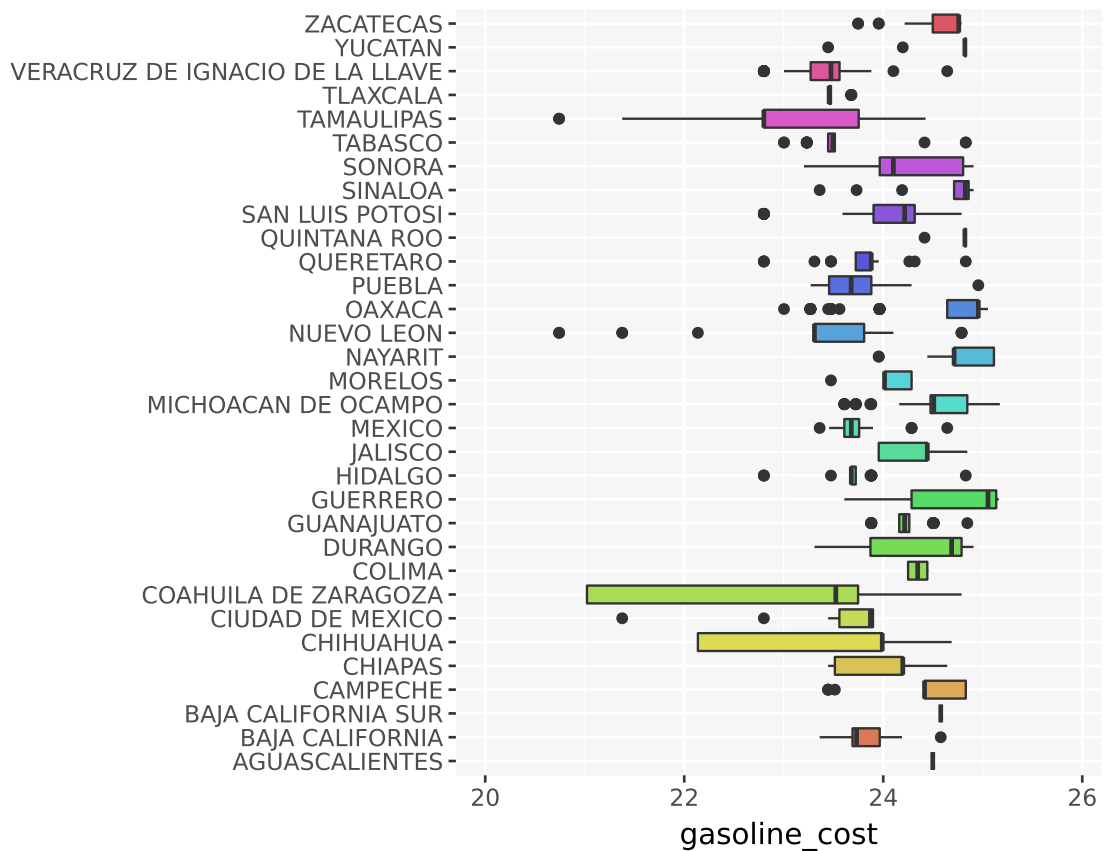

Figure 4: Dispersion of Gasoline Prices by State

Dispersion of Profits

```
(
    ggplot(data=df, mapping=aes(x='state', y='profit', fill='state'))
    + geom_boxplot()
    + coord_flip()
    + scale_y_continuous(limits=(-2, 3.9))
    + labs(x='',
           y='profit')
    + theme(legend_position='none',
            figure_size=(5.8, 4.5),
            panel_background=element_line(color='#f6f6f6',)
            )
)
```
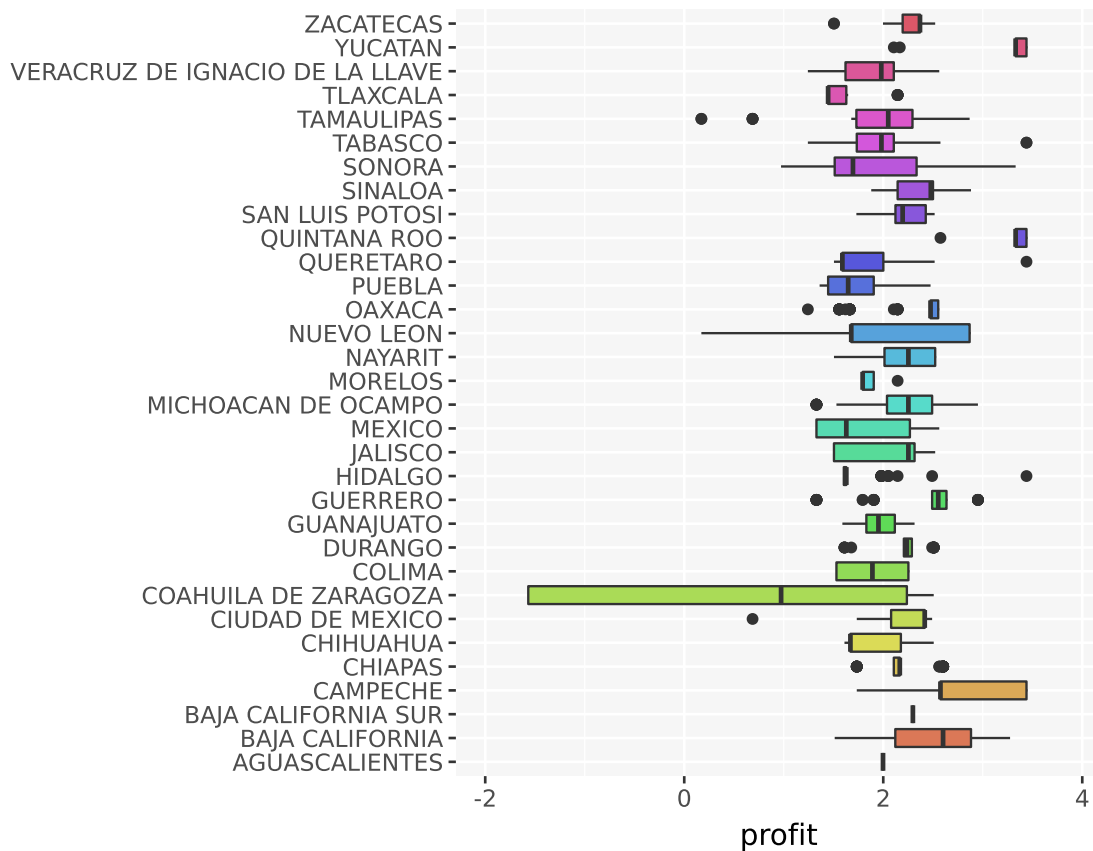

Figure 5: Dispersion of Profits by State

Geographical Distribution

```
from IPython.display import Image
Image('images/gasoline-sale-price.png')
```

Gasoline Sale Price by State in Mexico 2024

Jesus L. Monroy
Economist & Data Scientist

Source: Self-elaboration by author • Map data: © OSM • Created with Datawrapper

Conclusions

In most states, filling a 40-liter car tank costs around $1,000 pesos.

While precise price predictions are difficult, it's reasonable to expect continued volatility in gasoline prices in Mexico during 2025.

The interplay of global oil markets, government policies, and domestic economic conditions will create a dynamic environment. Consumers should be prepared for potential price fluctuations and consider strategies for managing their fuel expenses.

The energy sector, meanwhile, will be closely watched as Mexico navigates the complex challenges of ensuring affordable and accessible fuel for its population.

The future of gasoline prices in Mexico remains uncertain, but one thing is clear: it will continue to be a topic of significant importance for both consumers and policymakers.

Contact

Jesus L. Monroy
Economist & Data Scientist

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