Key Variables

1. d_ln_price: Change in the log of the diesel price
2. d_ln_TTL: Change in the log of total taxes and levies
3. d_d_ln_Lcost: Change in the difference in the log of the landed cost
4. d_ln_Scost: Change in the log of storage and distribution costs

Interpretation of Diesel Results

The lagged change in the diesel price, L(d_ln_price, 1), has a coefficient of 0.182, a t-value of 1.783, and is significant at the 10% level (p = 0.079). This suggests some short-term persistence in diesel prices: a 1% increase in diesel prices in the previous period is associated with a 0.18% increase in the current period. The relatively modest t-value implies moderate statistical confidence in this effect.

Changes in total taxes and levies (d_ln_TTL) have a strong and statistically significant positive effect on diesel prices, with a coefficient of 0.288, a t-value of 4.195, and a p-value less than 0.001. This implies that a 1% increase in taxes and levies leads to a 0.29% rise in diesel prices, reflecting the pass-through of fiscal charges into retail fuel prices.

The growth rate of landed costs (d_d_ln_Lcost) also exerts a significant impact on diesel pricing. The coefficient is 0.218, with a t-value of 5.115 and a p-value well below 0.001. This indicates that when the rate of increase in landed costs accelerates, diesel prices adjust upward accordingly, with a 1% increase in the second-differenced landed costs leading to a 0.22% increase in diesel prices. The high t-value (above 5) confirms this is a highly robust result.

Furthermore, the lagged value of this same variable (L(d_d_ln_Lcost, 1)) has a coefficient of 0.154, a t-value of 3.628, and a p-value below 0.001. This demonstrates that previous period changes in the rate of landed cost growth continue to influence diesel price adjustments, reflecting inertia or delayed cost transmission effects in the fuel pricing mechanism.

In contrast, the coefficient on d_ln_Scost, which captures short-run changes in storage and distribution costs, is relatively small at 0.008, with a low t-value of 0.352 and an insignificant p-value of 0.726. This suggests that fluctuations in these domestic logistical costs do not have a statistically meaningful effect on diesel price movements in the short run.

In terms of model diagnostics, the Residual Standard Error is 0.04083, which reflects the average deviation between the actual diesel prices and those predicted by the model. This relatively low value suggests a good model fit, indicating that most fluctuations in diesel prices are captured by the included explanatory variables.

The R-squared value of 0.4982 indicates that approximately 50% of the variance in diesel prices is explained by the independent variables. This is a substantial improvement over the petrol model and suggests that the explanatory power of the diesel model is relatively strong.

The Adjusted R-squared is 0.4613, which accounts for the number of predictors used. This means that after adjusting for model complexity, around 46% of the variation in diesel prices can still be attributed to the included factors taxes, levies, landed costs, and price lags.

The F-statistic is 13.5, with a p-value of 3.797e-09, confirming that the model is overall statistically significant. This indicates that the independent variables, taken together, have a meaningful explanatory relationship with diesel price changes.

In summary, for diesel, the ARDL model performs well, both in terms of individual coefficient significance and overall model fit. Key drivers of diesel prices include taxes and levies, both the current and lagged growth in landed costs, and the prior period's diesel price. Storage and distribution costs do not show a significant impact in the short run. These findings reinforce the influence of fiscal and international import-related factors in shaping Kenya's fuel prices, suggesting that policy shifts or global cost shocks would be quickly reflected in domestic diesel pricing.

III. Kerosene

Table 4.12: Auto-Regressive Distributed Lag Model Results (Kerosene)

Variable	Estimate	Standard Error	t value	Pr(>|t|)
Intercept	0.002011	0.005703	0.353	0.725563
L(d_ln_price, 1)	0.118592	0.116039	1.022	0.310570
L(d_ln_price, 2)	0.227386	0.107141	2.122	0.037627*
d_ln_TTL	0.188686	0.054082	3.489	0.000876 ***
d_d_ln_Lcost	0.257459	0.033918	7.591	1.56e-10 ***
L(d_d_ln_Lcost, 1)	0.186786	0.042796	4.365	4.66e-05 ***
L(d_d_ln_Lcost, 2	0.073916	0.032921	2.245	0.028160 *
d_ln_Scost	0.037037	0.182654	0.203	0.839946

Model Diagnostics

- Residual Standard Error: 0.04603 on 65 degrees of freedom
- Multiple R-squared: 0.5863
- Adjusted R-squared: 0.5418
- F-statistic: 13.16 on 7 and 65 DF, p-value: 1.994e-10

Significance Codes

- ***: p-value < 0.001
- **: p-value < 0.01
- *: p-value < 0.05
- . : p-value < 0.1
- (no symbol): p-value ≥ 0.1

Notes

- L = lag
- d = difference
- ln = log

Interpretation of Kerosene Results

The model diagnostics indicate that the residual standard error is 0.04603, suggesting that the model has a relatively good fit and that the predicted values do not deviate substantially from the actual values. This means the model captures much of the variation in the dependent variable, which is the change in the log of kerosene prices. The multiple R-squared value of 0.5863 indicates that approximately 58.6% of the variation in kerosene price changes is explained by the independent variables in the model. After adjusting for the number of predictors, the adjusted R-squared stands at 0.5418, which still represents a strong model fit. The F-statistic is 13.16 with a corresponding p-value of 1.994e-10, confirming that the model is statistically significant overall and that the explanatory variables, taken together, have a meaningful relationship with the dependent variable.

Intercept (0.002011, p = 0.725563):

- Estimate: 0.002011
- t-value:0.353

The intercept represents the baseline level of kerosene prices when all explanatory variables are held constant. With a high p-value of 0.725563, this result is not statistically significant, implying that the intercept does not contribute meaningfully to the prediction of kerosene price changes.

L(d_ln_price, 1) (0.118592, p = 0.310570):

- Estimate: 0.118592
- t-value: 1.022

This coefficient measures the short-run effect of kerosene prices in the previous period on current prices. While a 1% increase in the previous period's price is associated with a 0.12% increase in the current period, the high p-value (0.310570) and a t-value of 1.022 suggest that this relationship is not statistically significant. Therefore, there is insufficient evidence to conclude that the first lag of past kerosene prices has a meaningful short-term influence on current prices.

L(d_ln_price, 2) (0.227386, p = 0.037627):

- Estimate: 0.227386
- t-value: 2.122

The second lag of kerosene price changes is statistically significant at the 5% level. A 1% increase in prices two periods ago is associated with a 0.23% increase in current prices. The significance of this lag (p = 0.037627) suggests some degree of persistence or delayed adjustment in kerosene pricing behavior, indicating that past price dynamics still influence present outcomes.

d_ln_TTL (0.188686, p = 0.000876):

- Estimate: 0.188686
- t-value: 3.489

This coefficient captures the effect of changes in total taxes and levies on kerosene prices. The estimate indicates that a 1% increase in taxes and levies leads to a 0.19% increase in kerosene prices, assuming other factors are constant. The relationship is statistically significant at the 1% level, highlighting the strong impact of government-imposed fiscal instruments on kerosene price movements.

d_d_ln_Lcost (0.257459, p = 1.56e-10):

- Estimate: 0.257459
- t-value: 7.591

The change in the difference of the log of landed costs has a substantial and statistically significant impact on kerosene prices. A 1% increase in the change in landed cost is associated with a 0.26% rise in kerosene prices. The very low p-value and high t-value confirm that import-related costs—including freight, insurance, and other logistical expenses—are a key driver of kerosene price fluctuations.

L(d_d_ln_Lcost, 1) (0.186786, p = 4.66e-05):

- Estimate: 0.186786
- t-value: 4.365

The first lag of the change in landed cost is also statistically significant, suggesting that the effects of import-related cost changes persist beyond the current period. A 1% increase in the previous period's change in landed costs contributes to a 0.19% increase in kerosene prices in the current period. This implies a gradual pass-through effect of external cost changes into domestic prices.

L(d_d_ln_Lcost, 2) (0.073916, p = 0.028160):

- Estimate: 0.073916
- t-value: 2.245

The second lag of the change in landed costs is significant at the 5% level. A 1% increase in landed costs two periods prior leads to a 0.07% increase in current prices. This further supports the notion of delayed transmission of international cost shocks into the domestic kerosene market.

d_ln_Scost (0.037037, p = 0.839946):

- Estimate: 0.037037
- t-value: 0.203

This coefficient represents the impact of changes in storage and distribution costs on kerosene prices. While the estimate implies a positive relationship, the high p-value and low t-value indicate that the result is not statistically significant. Therefore, changes in domestic storage and distribution costs do not appear to significantly affect short-term kerosene pricing.

In summary, for kerosene, the ARDL model indicates that the lagged kerosene price, taxes and levies, and landed costs significantly affect kerosene prices, with the coefficients reflecting percentage changes based on the transformations applied to the variables. The analysis highlights the important role of government-imposed taxes and levies, as well as import-related costs, in determining short-term kerosene prices. While storage and distribution costs do not

show a significant effect in this model, the findings suggest that shifts in government taxation policies or changes in import costs are likely to have a notable impact on kerosene pricing in Kenya.

Comparison of Results

When comparing the results across Super Petrol, Diesel, and Kerosene, a few key trends and patterns emerge that highlight the varying influence of the explanatory variables on different fuel types. For all three fuels, taxes and levies (d_ln_TTL) have a significant impact on pricing, with a strong positive relationship between taxes and price increases. This suggests that government fiscal policies, particularly in the form of taxes and levies, play a crucial role in determining the price of all three fuels. However, the magnitude of the effect varies. For Super Petrol, the coefficient for d_ln_TTL is 0.3629, while for Diesel, it is 0.2884, and for Kerosene, it is 0.1887, indicating that taxes and levies have a more pronounced effect on Super Petrol prices.

In terms of landed costs, both Diesel and Kerosene show a significant and strong relationship with price changes. The coefficients for d_d_ln_Lcost are 0.2179 for Diesel and 0.2575 for Kerosene, suggesting that import-related costs, including transportation and insurance, play a more substantial role in the pricing of these two fuels compared to Super Petrol. In contrast, for Super Petrol, the coefficient for d_d_ln_Lcost is lower at 0.1382, reflecting a somewhat weaker dependence on landed costs for price formation.

Storage and distribution costs (d_ln_Scost) do not show a statistically significant effect on the price of any of the fuels, highlighting that, in the short term, other factors like taxes and import-related costs have a greater influence on fuel prices than storage and distribution.

In summary, while taxes and landed costs are significant for all three fuels, the extent of their impact varies. Super Petrol is more responsive to changes in taxes, while Diesel and Kerosene are more influenced by import-related costs.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a synthesis of the study in relation to the research objectives outlined earlier. Drawing on secondary data obtained from the Energy and Petroleum Regulatory Authority, as detailed in Chapter 4, we analyzed key variables influencing domestic petroleum pricing. The findings are further contextualized through theoretical and empirical insights from Chapter 2, enabling a comparative perspective. This integrative approach allows us to draw meaningful conclusions and explore the broader implications of the study. The chapter concludes the report by summarizing key findings, presenting the main conclusions, and offering policy recommendations and areas for further research.

5.2 Summary of the Findings

Model Fit and Diagnostics

The ARDL models for all three fuels exhibit statistically significant relationships between the dependent and independent variables. The adjusted R-squared values, 0.612 for Super Petrol, 0.551 for Diesel, and 0.542 for Kerosene, indicate that the models explain a substantial portion of the variance in fuel price changes. Residual standard errors are low (ranging from 0.042 to 0.046), and F-statistics for all models are significant (p-values < 0.001), confirming the overall robustness and explanatory power of the regressions.

Taxes and Levies

Taxes and levies (d_ln_TTL) emerge as a consistent and significant determinant of fuel prices across all three fuels:

- Super Petrol: A 1% increase in taxes and levies results in a 0.36% increase in price.
- Diesel: A 1% increase in taxes leads to a 0.29% increase in price.
- Kerosene: A 1% increase in taxes corresponds to a 0.19% increase in price.

These findings underscore the heavy influence of fiscal policy on fuel pricing. The relatively larger coefficient for Super Petrol suggests that consumers of this fuel bear a higher tax burden compared to users of Diesel and Kerosene.

Landed Costs

Landed costs, which include freight, insurance, and international procurement costs, are another major driver of fuel prices, particularly for Diesel and Kerosene:

- Kerosene: The effect of changes in the differenced log of landed costs is 0.26, the highest among the three fuels. The first and second lags of this variable are also significant, indicating persistent cost transmission from international markets.
- Diesel: Shows a similarly strong relationship, with an immediate effect of 0.22 and significant lags.
- Super Petrol: While still significant, the effect is more muted, with a coefficient of 0.14.

This suggests that Diesel and Kerosene are more susceptible to international cost shocks, likely reflecting their supply chains and pricing structure, which may involve longer contracts or less price smoothing.

Lagged Price Effects

Lagged price variables are included to capture inertia and delayed price adjustments:

- For Super Petrol and Diesel, the first lag of price is significant, showing a mild persistence in price trends.
- For Kerosene, the second lag (coefficient of 0.23) is significant, suggesting a more delayed adjustment mechanism in the pricing behavior for this fuel.

These dynamics suggest that while fuel prices respond to contemporaneous changes in input costs and taxes, historical prices also play a role, possibly due to price setting practices or regulatory smoothing mechanisms.

Storage and Distribution Costs

Storage and distribution costs (d_ln_Scost) are not statistically significant in any of the three models. This indicates that short-term fluctuations in storage and distribution costs have limited influence on consumer pump prices, which may be due to the relatively stable nature of these domestic operational costs or their treatment within broader pricing formulas.

Table: 5.1 Summary of Key Results

Variable	Super Petrol	Diesel	Kerosene
Taxes & Levies (TTL)	**0.3629**	**0.2884**	**0.1887**
Landed Costs (Lcost)	0.1382	**0.2179**	**0.2575**
Lagged Prices	Lag 1 (sig.)	Lag 1 (sig.)	Lag 2 (sig.)
Storage & Distribution	Not sig.	Not sig.	Not sig.
Adj. R-squared	0.612	0.551	0.542
F-statistic p-value	< 0.001	< 0.001	< 0.001

These findings confirm that taxation and import-related costs are the primary drivers of fuel prices in Kenya. While the magnitude and timing of effects differ by fuel type, the policy implication is clear: interventions targeting taxes or improving efficiency in fuel imports could significantly affect fuel affordability, especially for Diesel and Kerosene, which are more sensitive to landed cost variations. Super Petrol, on the other hand, remains most affected by domestic fiscal policy decisions.

5.3 Conclusion

In conclusion, this analysis offers a comprehensive perspective on the primary drivers of domestic petroleum prices in Kenya, taxation, landed costs, and storage/distribution expenses, through the lens of Super Petrol, Diesel, and Kerosene pricing. While all three variables influence fuel prices, their intensity and timing differ across fuel types, revealing the layered nature of Kenya's fuel pricing structure.

Taxes and levies emerge as the most consistent and significant contributor to fuel price changes, especially for Super Petrol. Their outsized influence points to the central role of fiscal policy in shaping consumer costs. Conversely, landed costs, shaped by global oil markets, exchange rates, and procurement efficiency, play a stronger role in Diesel and Kerosene pricing. This exposes consumers to international volatility, especially for fuels relied on by low- and middle-income households.

Storage and distribution costs, though less impactful in the short term, still offer room for efficiency gains. Their relatively minor role suggests that price reforms focused solely on this area would have limited immediate impact unless integrated with broader supply chain improvements.

Importantly, the differentiated effects across fuel types call for more targeted policy instruments. A one-size-fits-all pricing or subsidy model risks exacerbating inequalities, especially since Kerosene and Diesel are closely tied to transport and household energy for the poor.

Beyond pricing mechanics, this study underscores a broader imperative: to design a petroleum pricing framework that is not only responsive to market signals but also socially sensitive and economically sustainable. This entails reforming tax structures, improving procurement strategies to hedge global price shocks, and enhancing transparency to build public trust.

In sum, managing fuel prices effectively in Kenya demands a blend of fiscal prudence, market efficiency, and pro-poor sensitivity. By aligning pricing policy with broader development goals including energy access, consumer protection, and economic resilience, Kenya can move toward a more stable and equitable fuel pricing regime.

5.4 Implications of Study and Recommendations

5.4.1 Implications

The findings regarding domestic petroleum prices in Kenya carry significant implications for policymakers, stakeholders, and consumers in the energy sector. Firstly, the influence of taxes, landed costs, and storage costs underscores the diverse dynamics shaping petroleum pricing. Policymakers must carefully consider the impacts of taxation policies and international market factors on domestic prices to ensure affordability and stability for consumers.

Secondly, the differential impacts across different types of fuel highlight the need for tailored strategies to manage price fluctuations effectively. While taxes exert a significant influence on

diesel and super petrol prices, the sensitivity of kerosene prices to landed costs suggests the importance of managing global market dynamics and transportation logistics.

Furthermore, the relatively modest impact of storage costs on petroleum prices indicates opportunities for optimization in storage and distribution infrastructure. Investments in storage facilities and logistics management can help minimize costs and enhance price stability, benefiting both consumers and industry stakeholders.

5.4.2 Policy Recommendations

This analysis offers valuable insights for policymakers and stakeholders in the petroleum sector, emphasizing the need to consider both immediate and lagged effects of key economic factors to effectively manage and predict fuel prices. By understanding the short-term impacts and acknowledging the lack of long-term stability, strategies can be developed to address immediate price fluctuations while exploring other factors that might contribute to long-term pricing stability. Drawing upon the insights from the analysis, the following policy recommendations can effectively address the implications of the findings on domestic petroleum prices in Kenya:

i. Taxation Policies

Implementing taxation policies that strike a balance between revenue generation and price stability is crucial for ensuring a sustainable and equitable petroleum pricing framework. These policies should be designed to consider the differential impacts of different fuel types and their effects on consumers and businesses. One approach to achieving this balance is through a tiered taxation system that takes into account the varying sensitivities of different fuels to tax adjustments. For example, fuels like diesel and super petrol, which are widely used in transportation and industrial sectors, may be subject to higher taxation rates compared to fuels like kerosene, which are primarily used for household cooking and lighting purposes. By tailoring tax rates to reflect the specific characteristics and usage patterns of different fuels, policymakers can minimize the adverse effects of taxation on consumers while still generating sufficient revenue to support government programs and services. Moreover, tax adjustments should be implemented gradually and predictably to avoid sudden shocks to petroleum prices,

which can disrupt economic stability and erode consumer confidence. Transparent communication and stakeholder engagement are essential throughout the tax adjustment process to ensure that all affected parties are adequately informed and have an opportunity to provide feedback and input. In addition to taxation policies, complementary measures such as subsidies, targeted assistance programs, and investment in alternative energy sources can help mitigate the impact of taxation on vulnerable populations and facilitate the transition to cleaner and more sustainable energy options.

ii. Management of Landed Costs

One approach to managing landed costs is to optimize the sourcing of petroleum products from global markets. This may involve diversifying import sources to reduce dependence on a single supplier or region, thereby mitigating the risk of supply disruptions and price volatility. Additionally, establishing long-term supply contracts and strategic partnerships with reliable suppliers can provide stability and certainty in procurement, helping to minimize the impact of fluctuations in international oil prices on domestic prices.

iii. Optimization of Storage Infrastructure

Increasing storage capacity through investment in new facilities or expansion of existing ones allows for greater flexibility in managing petroleum inventories. Adequate storage capacity enables suppliers to take advantage of favorable market conditions by stockpiling petroleum products during periods of low demand and releasing them when demand is high, thereby stabilizing prices and ensuring a reliable supply of petroleum products to meet consumer needs. Also, the strategic location of storage facilities plays a critical role in optimizing logistics and minimizing transportation costs. Investing in storage facilities situated in strategic locations, such as near major transportation hubs or consumption centers, reduces transportation distances and associated costs, leading to greater efficiency and cost savings in the supply chain.

5.5 Areas for Further Research

This study concentrated on assessing the extent to which certain factors i.e., landed costs, taxes, and levies, storage costs influence domestic prices of petroleum products in Kenya. From the study findings and conclusion, further research can be done on investigating consumer behavior and price sensitivity in response to changes in petroleum prices including the differential impacts on different socio-economic groups and regions.

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APPENDICES

Appendix 1: Sample of Maximum Retail Petroleum Prices in Nairobi

Breakdown of the costs of Super Petrol (PMS), Diesel (AGO) and Kerosene (DPK) in Nairobi: 15th August – 14th September 2023

Cost Item	Cost Description	Super Petrol	Diesel	Kerosene
		KShs./Litre	KShs./Litre	KShs./Litre
Landed Cost (a)	Weighted Average cost for all imports	107.99	102.97	101.15
Pipeline Transport (Msa-Nrb)	Pipeline (100% PMS, AGO & IK)	2.58	2.58	2.58
Road Transport (Msa-Nrb) - Bridging	Road (0% PMS, AGO & IK)	0.00	0.00	0.00
Pipeline Losses	Pipeline (0.25%)	0.06	0.05	0.05
Depot Losses	0.5% PMS; 0.3% For DPK & AGO	0.79	0.43	0.41
Delivery within 40kms of Nrb	Delivery to retail stations	0.54	0.54	0.54
Storage and distribution (b)		3.97	3.60	3.58
Importers Margin	Wholesale	0.00	1.08	0.00
Dealers Margin	Retail Investment &Operating Margin	6.07	8.19	7.41
Oil Marketing Companies margins (c)		6.07	9.27	7.41
Excise Duty	Tax	21.95	11.37	11.37
Road Maintenance Levy	Levy	18.00	18.00	0.00
Petroleum Development Levy	Levy	5.40	5.40	0.40
Petroleum Regulatory Levy	Levy	0.25	0.25	0.25
Railway Development Levy	Levy	1.56	1.49	1.47
Anti-adulteration Levy	Levy	0.00	0.00	18.00
Merchant Shipping Levy	Levy	0.03	0.04	0.03
Import Declaration Fee	Levy	2.61	2.50	2.44
Value Added Tax (VAT)	Tax	26.85	24.78	23.38
Taxes and levies (d)		76.65	63.83	57.34
Retail Prices in Nairobi (a) + (b) + (c) + (d)		194.68	179.67	169.48
Summary		Super Petrol	Diesel	Kerosene
		KShs./Litre	KShs./Litre	KShs./Litre
Products Costs (a)		107.99	102.97	101.15
Distribution and storage Costs (b)		3.97	3.60	3.58
Margins (c)		6.07	9.27	7.41
Taxes & Levies (d)		76.65	63.83	57.34
Retail Prices in Nairobi		194.68	179.67	169.48

Appendix 2: Petroleum Product Dataset

Super Petrol Data

Period	Total Taxes and Levies	Super Petrol Price	Landed Costs	Storage Costs
15/01/2018	39.14	106.3	51.91	4.36
15/02/2018	39.16	107.92	53.51	4.36
15/03/2018	39.17	107.46	53.04	4.36
15/04/2018	39.15	106.83	52.42	4.37
15/05/2018	39.16	107.17	52.75	4.37
15/06/2018	39.18	108.81	54.36	4.38
15/07/2018	39.37	112.2	57.53	4.41
15/08/2018	39.37	113.73	59.05	4.42
15/09/2018	54.86	125.59	56.37	3.47
15/10/2018	45.94	115.73	55.44	3.46
15/11/2018	46.21	118.11	57.54	3.45
15/12/2018	45.75	113.54	53.45	3.45
15/01/2019	45.98	115.825	55.495	3.45
15/02/2019	44.38	100.09	41.44	3.38
15/03/2019	44.5	101.35	42.57	3.39
15/04/2019	45.02	106.6	47.27	3.42
15/05/2019	45.59	112.03	52.09	3.45
15/06/2019	45.9	115.1	54.84	3.47
15/07/2019	46.83	115.39	54.19	3.48
15/08/2019	46.365	115.245	54.515	3.475
15/09/2019	46.58	112.81	51.91	3.43
15/10/2019	46.09	108.05	47.65	3.41
15/11/2019	47.17	110.59	48.13	2.89

15/12/2019	47.05	109.5	47.18	2.88
15/01/2020	47.13	110.2	47.79	2.88
15/02/2020	40.55	112.87	49.77	3.28
15/03/2020	47.17	110.87	48.04	3.27
15/04/2020	45.07	92.87	32.22	3.19
15/05/2020	46.77	83.33	21.02	3.15
15/06/2020	46.04	89.1	27.48	3.19
15/07/2020	53.55	100.48	31.42	3.11
15/08/2020	54.06	103.95	34.36	3.14
15/09/2020	55.37	106.55	35.63	3.15
15/10/2020	55.46	107.27	36.23	3.17
15/11/2020	55.28	105.85	35.01	3.17
15/12/2020	55.39	106.82	35.86	3.18
15/01/2021	55.42	106.99	36.01	3.17
15/02/2021	56.42	115.18	43.15	3.22
15/03/2021	57.33	122.81	49.84	3.25
15/04/2021	57.58	122.81	53.99	3.29
15/05/2021	57.77	126.37	52.92	3.29
15/06/2021	57.87	127.14	53.59	3.29
15/07/2021	58.01	127.14	57.16	3.15
15/08/2021	58.22	127.14	60.46	3.17
15/09/2021	58.81	134.72	60.35	3.17
15/10/2021	58.51	129.72	61.78	3.17
15/11/2021	58.82	129.72	67.96	2.94
15/12/2021	59	129.72	71.98	3.31
15/01/2022	58.85	129.72	68.83	3.3
15/02/2022	59.92	129.72	68.64	3.3
15/03/2022	57.33	144.62	78.14	3.35
15/04/2022	61.34	144.62	94.42	3.39

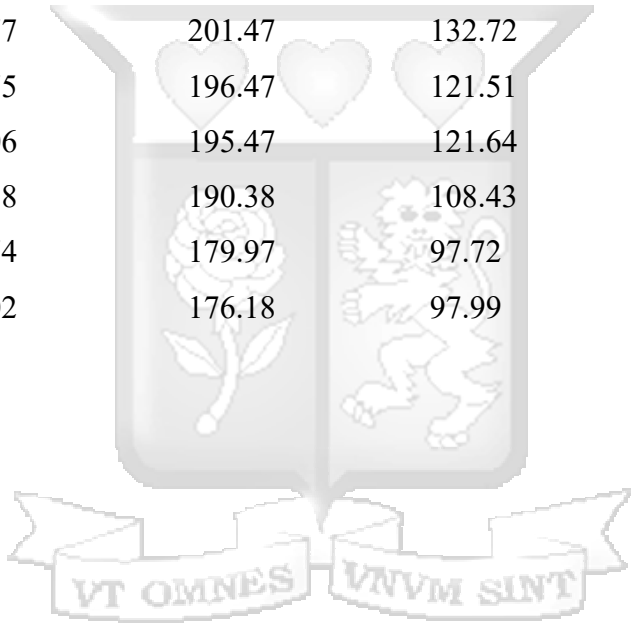
15/05/2022	62.89	150.12	96.86	3.4
15/06/2022	62.89	159.12	104.05	3.45
15/07/2022	64.06	159.12	125.98	3.62
15/08/2022	64.3	159.12	129.65	3.62
15/09/2022	64.14	179.3	99.33	3.44
15/10/2022	63.64	178.3	90.99	3.8
15/11/2022	63.29	177.3	87.9	3.78
15/12/2022	63.43	177.3	89.15	3.79
15/01/2023	63.25	177.3	86.36	3.81
15/02/2023	63.37	177.3	87.06	3.82
15/03/2023	63.68	179.3	90.39	3.83
15/04/2023	63.86	179.3	93.49	3.89
15/05/2023	64.55	182.7	101.83	3.93
15/06/2023	64.45	182.04	101.27	3.93
15/07/2023	77.27	194.68	101.08	3.94
15/08/2023	76.65	194.68	107.99	3.97
15/09/2023	79.31	211.64	115.93	4.01
15/10/2023	80.37	217.36	123.12	4.05
15/11/2023	80.57	217.36	130.6	4.15
15/12/2023	79.09	212.36	111.05	4.04
15/01/2024	78.36	207.36	107.6	4.07
15/02/2024	78.76	206.36	110.17	4.08
15/03/2024	77.52	199.15	104.33	4.05
15/04/2024	76.57	193.7	99.94	3.94
15/05/2024	76.73	192.84	103	3.96

Diesel Data

Period	Total Taxes and Levies	Diesel Price	Landed Costs	Storage and Distribution Costs
15/01/2018	29.53	94.82	50.27	4.13
15/02/2018	29.57	96.96	52.37	4.13
15/03/2018	29.57	97.86	53.25	4.15
15/04/2018	29.57	97.86	53.25	4.15
15/05/2018	29.59	98.64	54	4.16
15/06/2018	29.65	99.6	54.88	4.18
15/07/2018	29.78	103.25	58.4	4.18
15/08/2018	29.78	102.74	57.89	4.18
15/09/2018	43.95	115.47	57.39	3.24
15/10/2018	36.76	109.72	58.83	3.24
15/11/2018	37.09	112.83	61.6	3.25
15/12/2018	37.02	112.28	61.11	3.26
15/01/2019	37.055	112.555	61.355	3.255
15/02/2019	35.35	95.96	46.52	3.2
15/03/2019	35.43	96.61	47.09	3.2
15/04/2019	36	102.11	52.02	3.22
15/05/2019	36.22	104.37	54.03	3.23
15/06/2019	36.27	104.77	54.37	3.24
15/07/2019	36.66	103.88	53.11	3.23
15/08/2019	36.465	104.325	53.74	3.235
15/09/2019	36.56	103.04	52.39	3.21
15/10/2019	36.45	101.96	51.42	3.21
15/11/2019	37.6	104.61	51.96	2.69
15/12/2019	37.29	101.78	49.46	2.68
15/01/2020	37.35	102.32	49.93	2.68
15/02/2020	30.48	104.45	51.45	3.07
15/03/2020	37.23	101.65	49	3.06
15/04/2020	36.74	97.56	45.41	3.05

15/05/2020	36.65	78.37	26.35	3.01
15/06/2020	34.8	74.57	24.4	3.01
15/07/2020	42.99	91.87	33.59	2.93
15/08/2020	43.38	94.63	35.94	2.95
15/09/2020	43.38	94.51	35.89	2.95
15/10/2020	43.69	92.91	33.89	2.97
15/11/2020	43.42	90.7	31.97	2.95
15/12/2020	43.55	91.82	32.95	2.96
15/01/2021	44.11	96.4	36.96	2.97
15/02/2021	44.78	101.91	41.78	2.99
15/03/2021	45.28	107.66	46.82	3.01
15/04/2021	45.6	107.66	48.95	3.03
15/05/2021	45.52	107.66	47.39	3.03
15/06/2021	45.98	107.66	50.64	3.04
15/07/2021	45.75	107.66	53.96	2.9
15/08/2021	45.97	107.66	56.32	2.9
15/09/2021	46.46	115.6	53.88	2.9
15/10/2021	46.2	110.6	56	2.9
15/11/2021	46.57	110.6	63.2	0.83
15/12/2021	46.84	110.6	68.65	3.01
15/01/2022	46.64	110.6	65.1	3.01
15/02/2022	48.63	110.6	69.87	3.01
15/03/2022	45.47	115.6	77.97	3.05
	49.54	125.5	97.78	3.08
15/04/2022				
15/05/2022	50.32	131	105.89	3.11
15/06/2022	51.65	140	117.46	3.15
15/07/2022	51.89	140	122.28	3.19
15/08/2022	52.49	140	133.19	3.23
15/09/2022	53.39	165	115.36	3.16
15/10/2022	52.97	163	110.92	3.55
15/11/2022	52.77	162	112.11	3.55
15/12/2022	53.17	162	116.12	3.56

15/01/2023	52.65	162	109.35	3.59
15/02/2023	52.52	162	103.38	3.56
15/03/2023	52.54	162	103.01	3.56
15/04/2023	52.33	162	100.04	3.58
15/05/2023	52.63	168.4	99.83	3.5
15/06/2023	52.68	167.28	98.66	3.5
15/07/2023	65.03	179.67	99.84	3.59
15/08/2023	63.83	179.67	102.97	3.6
15/09/2023	67.35	200.99	117.63	3.65
15/10/2023	68.42	205.47	130.73	3.7
15/11/2023	68.3	203.47	136.12	3.72
15/12/2023	67.77	201.47	132.72	3.76
15/01/2024	66.75	196.47	121.51	3.77
15/02/2024	67.06	195.47	121.64	3.77
15/03/2024	65.88	190.38	108.43	3.71
15/04/2024	63.74	179.97	97.72	3.59
15/05/2024	64.02	176.18	97.99	3.6

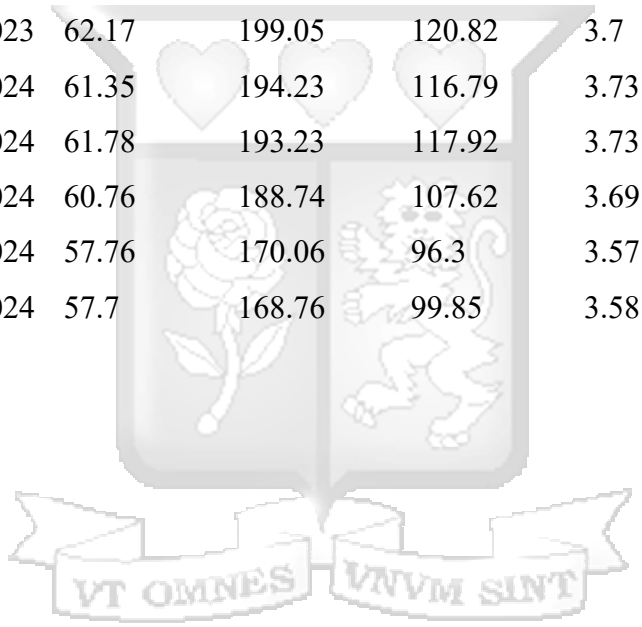


Kerosene Data

Period	Total Taxes and Levies	Kerosene Price	Landed Costs	Storage and Distribution Costs
15/01/2018	8.38	74.78	51.94	3.57
15/02/2018	8.41	76.75	53.87	3.58
15/03/2018	8.42	77.45	54.56	3.58
15/04/2018	8.4	76.72	53.84	3.59
15/05/2018	8.43	78.22	55.31	3.59
15/06/2018	8.51	84.1	61.09	3.61
15/07/2018	11.79	85.73	59.42	3.63
15/08/2018	11.78	84.95	58.66	3.62
15/09/2018	25.97	97.7	57.67	3.17
15/10/2018	36.66	108.84	58.05	3.24
15/11/2018	36.98	111.83	60.7	3.26
15/12/2018	36.32	105.22	54.48	3.23
15/01/2019	36.65	108.525	57.59	3.245
15/02/2019	35.44	96.5	47.51	3.2
15/03/2019	35.77	99.46	51.01	3.22
15/04/2019	36	102.22	52.11	3.22
15/05/2019	36.25	104.62	54.25	3.23
15/06/2019	36.21	104.28	53.95	3.23
15/07/2019	36.44	101.97	51.41	3.23
15/08/2019	36.325	103.125	52.68	3.23
15/09/2019	36.31	100.64	50.24	3.2
15/10/2019	36.35	101.08	50.63	3.21
15/11/2019	37.52	104.06	51.49	2.69
15/12/2019	37.31	102.31	49.96	2.68
15/01/2020	37.53	103.95	51.38	2.68
15/02/2020	30.48	102.69	49.9	3.06
15/03/2020	36.49	95.46	43.56	3.05

15/04/2020	34.36	77.28	27.56	3
15/05/2020	36.83	79.77	27.56	3.02
15/06/2020	33.36	62.46	13.77	2.97
15/07/2020	35.03	65.45	15.21	2.85
15/08/2020	37.32	83.65	31.06	2.91
15/09/2020	37.84	83.73	30.61	2.91
15/10/2020	37.84	83.73	30.61	2.91
15/11/2020	37.58	81.63	28.77	2.92
15/12/2020	37.82	83.56	30.45	2.93
15/01/2021	38.25	87.12	33.57	2.94
15/02/2021	38.9	92.44	38.22	2.96
15/03/2021	39.55	97.85	42.96	2.98
15/04/2021	39.73	97.85	46.23	3
15/05/2021	39.72	97.85	46.2	3
15/06/2021	40.32	97.85	48.48	3.01
15/07/2021	40.32	97.85	48.48	3.01
15/08/2021	40.11	97.85	53.86	2.88
15/09/2021	40.11	97.85	53.86	2.88
15/10/2021	40.49	103.54	52.44	2.88
15/11/2021	40.78	103.54	58.15	2.96
15/12/2021	41.34	103.54	68.63	3
15/01/2022	41.17	103.54	65.75	2.99
15/02/2022	42.12	103.54	61.96	2.98
15/03/2022	41.645	103.54	63.855	2.985
15/04/2022	42.67	113.44	79.89	3
15/05/2022	44.47	118.94	105.61	3.08
15/06/2022	45.18	127.94	106.6	3.09
15/07/2022	45.67	127.94	116.03	3.15
15/08/2022	46.64	127.94	134.39	3.22
15/09/2022	46.81	147.94	109.94	3.13
15/10/2022	46.76	146.94	109.71	3.53
15/11/2022	46.17	145.94	100.28	3.49
15/12/2022	46.5	145.94	106.77	3.52

15/01/2023	46.43	145.94	106.86	3.56
15/02/2023	46.27	145.94	101.74	3.54
15/03/2023	46.4	145.94	105.38	3.55
15/04/2023	46.16	145.94	99.71	3.56
15/05/2023	47.17	161.13	98.04	3.56
15/06/2023	47.22	161.48	98.34	3.56
15/07/2023	58.38	169.48	95.18	3.56
15/08/2023	57.34	169.48	101.15	3.58
15/09/2023	62.81	202.61	123.78	3.66
15/10/2023	63.53	205.06	133.48	3.69
15/11/2023	63.01	203.06	127.11	3.78
15/12/2023	62.17	199.05	120.82	3.7
15/01/2024	61.35	194.23	116.79	3.73
15/02/2024	61.78	193.23	117.92	3.73
15/03/2024	60.76	188.74	107.62	3.69
15/04/2024	57.76	170.06	96.3	3.57
15/05/2024	57.7	168.76	99.85	3.58



Appendix 3: Updated Sample Dataset After Filling the Missing Data

Period	Excise	RML	PDL	PRL	RDL	MSL	IDF	VAT	TTL	Pprice	Lcost	Scost
15/11/2018	19.9	18	0.4	0.25	0.83	0.02	1.1	5.71	46.21	118.11	57.54	3.45
15/12/2018	19.9	18	0.4	0.25	0.78	0.02	1.02	5.38	45.75	113.54	53.45	3.45
15/01/2019	19.9	18	0.4	0.25	0.805	0.02	1.06	5.545	45.98	115.825	55.495	3.45
15/02/2019	19.9	18	0.4	0.25	0.6	0.02	0.79	4.42	44.38	100.09	41.44	3.38
15/03/2019	19.9	18	0.4	0.25	0.61	0.02	0.81	4.51	44.5	101.35	42.57	3.39
15/04/2019	19.9	18	0.4	0.25	0.67	0.02	0.9	4.88	45.02	106.6	47.27	3.42
15/05/2019	19.9	18	0.4	0.25	0.75	0.02	1	5.27	45.59	112.03	52.09	3.45
15/06/2019	19.9	18	0.4	0.25	0.79	0.02	1.05	5.49	45.9	115.1	54.84	3.47
15/07/2019	20.92	18	0.4	0.25	0.77	0.02	1.03	5.44	46.83	115.39	54.19	3.48
15/08/2019	20.41	18	0.4	0.25	0.78	0.02	1.04	5.465	46.365	115.245	54.515	3.475
15/09/2019	20.92	18	0.4	0.25	0.74	0.02	0.99	5.26	46.58	112.81	51.91	3.43

Appendix 4: Ethics Clearance Release Letter

Initially, I applied for an expedited ethical review, which, according to the university's research guidelines, was expected to be completed within four to five days. Despite multiple follow-ups via email over several weeks, I was eventually informed that the system was down, leading to an unexpected delay in the review process. Given this delay, I revisited the research guidelines, particularly the section on ethics approval. The guidelines state that immediately after the proposal defense but before commencing research, one must submit an ethics approval application to the university's Ethics Review Board, including the similarity report. I adhered to this requirement and submitted my application accordingly. However, as the guidelines did not explicitly state that an ethics approval certificate was a prerequisite before initiating research, I interpreted that submitting my application in early May was sufficient to proceed. Consequently, I began my research after submitting my ethics approval request, I proceeded based on my understanding of the guidelines. However, I acknowledge that the guidelines specify that the Strathmore University Institutional Ethics Review Committee (SU-IERC) is responsible for reviewing research proposals with both major and minimal ethical risks. My study relied on secondary data obtained from the Energy and Petroleum Regulatory Authority (EPRA), which is publicly accessible through press releases on their official website. As such, I assumed that this data was unrestricted in its use and did not require additional permissions for further analysis. In adherence to ethical standards, I have cited the original source in all instances. Furthermore, the data used in this study does not contain personal or sensitive information, eliminating any risk of harm to individuals. I ensured the accuracy of the secondary data for answering my research questions, critically evaluated its methodology of collection, and included the complete dataset in the appendix.

Following this explanation, I was granted the attached letter below and allowed to continue with this research.

Strathmore UNIVERSITY

4th June 2024

Fiona Okadia

66121

fiona.okadia@strathmore.edu

Dear Fiona,

RE: Assessing the Extent to which International and Local Factors Influence Domestic Fuel Prices in Kenya

This is to inform you that the Office of Graduate Studies on 3rd June 2024 received your acknowledgement of breach in ethical processes given that you have already collected data and proceeded to write the Thesis prior to obtaining Ethical clearance. The ethics approval process is ONLY done before any collection of primary or secondary data.

This is a letter for you to proceed with the next steps of your academic requirements.

Please be advised, that in future, all research proposals should be submitted to the SU-ISERC through the RHInnO Ethics platform: https://strathmoreuniversity.rhinno.net/login

Disclaimer: *1) This is not in any way an ethical approval letter. 2) Should there be any legal implications/actions emanating from the research in terms of any ethical violations, you will be personally liable.*

Yours sincerely,

Dr. Bernard Shibwabo
Director of Graduate Studies