Impacts of gasoline price on price of barley in the province of Alberta, Canada.

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ABSTRACT

This study investigates the connection between Alberta, Canada's gasoline price and the price of barley. Understanding the effects of gasoline price changes is essential given the growing worries about food prices, particularly for commodities like barley. The study aims to clarify this relationship and offer information to stakeholders and policymakers. The paper uses a multivariate time series model, Vector Auto Regression. The study investigates how gasoline costs affect barley prices by examining the price trends of barley in Alberta.

The results revealed an increasing trend of barley price, although there were price fluctuations as the year progresses. Results from the VAR-X model shows a positive correlation between barley own price of the first previous month and the current price of barley. Which suggest that the previous price of barley has relevant information to determine the current price of barley. Gasoline price on the other hand shows a significant effect on barley price with it second previous month price. This also implies that, there exist relevant information in the second previous month price of gasoline to estimate the current price of barley.

PREFACE

In Alberta, Canada, this research investigates the complex relationship between the cost of gasoline and the cost of barley. Understanding how changes in gasoline prices affect important agricultural commodities like barley is essential given the world's worries about food security and commodity price volatility. The purpose of this research is to understand these processes and offer guidance to decision-makers. This study clarifies the magnitude of the impact of gasoline prices on the price of barley by analysing data and using a strict approach. The study presents suggestions and tactics to lessen the difficulties brought on by gasoline price swings in the barley market. This research will educate interested parties and support the long-term viability of Alberta's agriculture industry.

DEDICATION

The diligent farmers of Alberta, Canada, whose steadfast commitment and fortitude support the agricultural sector, are honoured by this paper. They work nonstop to cultivate the soil, plant seeds, and gather crops, which sustains local economies and advances the welfare of our country. We want to express our gratitude to the men and women who work tirelessly, despite the difficulties posed by the agricultural environment's constant change. May their indomitable spirit serve as an inspiration to and compass for our research, guaranteeing a better future for Alberta's farming community.

ACKNOWLEDGEMENT

I am grateful to myself for having the inspiration to work on this paper and its success.

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I also honor all those who contributed to the success of this study.

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LIST OF SYMBOLS

APA American Psychological Association

Bp Barley price

DF Dickey Fuller

Gp Gasoline price

VAR Vector Auto Regression

CHAPTER ONE: INTRODUCTION

1.1 Background of study

Barley is one of the major food crops cultivated on large scale in Canada with Alberta, Saskatchewan and Manitoba province leading the production scale, predominantly due to the rich soil and favorable climatic conditions conducive for barley production. According to Izydorczyk (2021), the total area planted with barley in western Canada in 2021 was 3.257 million hectares. This is 10% higher than year 2020, and 25% higher than the 10-year average. However, total barley production in western Canada in 2021 was 6,602,000 tonnes. This shows a drastic decrease in output by about 36.62%. This is evident from figure 1 below.

Figure 1: Total barley produced in western Canada.

Source: Statistics Canada.

A key factor leading to a drop in yield of barley is severe drought (Izydorczyk, 2021). The variations in barley prices are evident in figure 2.

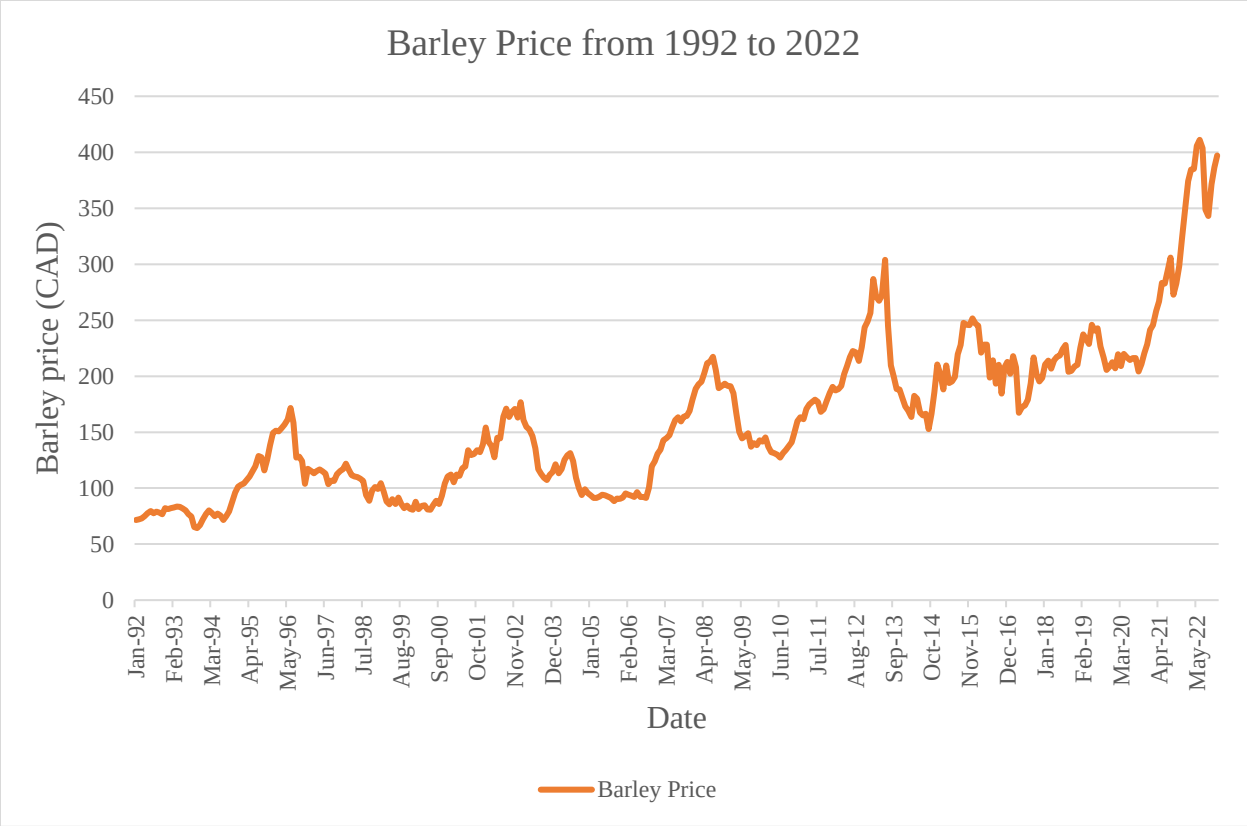

Figure 2: Trend of barley price from 1992 to 2022

Source: Statistics Canada

However, the prices of food crops which barley is not an exception have showed a remarkable increase over the past few years (Wodon *et al*., 2008). Major supply shocks to domestic food prices are likely to drive many people into poverty. These crisis in food crop prices which has affected most families worldwide has attracted the urgent need for governments to strengthen their safety net systems to ensure that the prices of food crops do not trigger an increase in poverty rates. For policy makers and stakeholders in Canada however, rising food prices have been issues of economic importance and political sensitivity for decades.

Although most households enjoy consuming products made from barley, the quantities that can be bought are usually constrained by rising prices, thereby impacting negatively on their daily consumption levels. However, one cannot deny the fact that even though the poor are mostly affected by these price increases, net sellers of food crops may benefit ultimately from such price hikes (Anriquez *et al*, 2013). According to De Hoyos and Medvedev (2011), higher and unstable

food prices substantially hurt the poor or net food consumers the most, since food typically form large share of their expenditure. This makes them experience a lot of hardships when prices of foods that forms part of their daily diets increase. Following the events of the 2007-2008 global food crisis, agricultural commodity prices have continued to rise even more sharply afterwards (FAO, 2008).

It is an undisputed fact that fundamental demand and supply forces, climatic conditions as well as other factors such as pests and diseases affect output and therefore food crop prices. The general observation is that whenever gasoline prices increase, food crop prices tend to be upwardly adjusted. This is evident since, gasoline is needed to complete most of the agricultural activities, such as land preparation and transportation. This means that gasoline price movement has appreciable impact in determining the price of food crops on the market. For this reason, consumers always stand the risk of the impact that gasoline price changes have on prices of food commodities. These dynamics are best expressed by the words of Dancy (2012), who states that "food prices mirror oil prices". Therefore, any time there is a change in gasoline price, it directly or indirectly affects the price of food commodities in general.

Given these occurrences, there are solid grounds for suspecting a causal relationship between gasoline prices and the prices of barley. Secondly, Roache (2010) noted that because agriculture and technology are mostly dependent on petroleum (gasoline), any change in the price of gasoline globally could result in adjustments to the cost of producing agricultural products, which would then alter the prices of the resulting commodities. Thus, in this study, I will be analysing the relationship between price of gasoline and barley price.

1.2 Problem Statement

The human security of millions of disadvantaged individuals worldwide has been severely damaged by the abrupt increase in food costs during recent years. In order to help the government, producers, and consumers make educated decisions, it is critical to look at variables that drive food prices as well as determine the trajectory of food costs. There have been some studies done on factors affecting food commodity prices and their impacts on consumers, but information on how the local economy or markets respond to changes in oil is limited.

Policy makers, consumers, traders, producers, and all other stakeholders will benefit from knowing the overall price patterns of barley as a result of this study. Additionally, it will assist them in coming up with the best solutions to lessen the shock of ongoing price increases. What margin would the price of barley vary given a percentage change in gasoline price? are some issues that merit discussion.

According to Wodon et al. (2008), prices for food crops, including barley, have increased significantly over the previous few years. It's likely that many individuals will fall into poverty if there are significant supply shocks to domestic food costs. Governments urgently need to enhance their safety net systems as a result of the food crop price issue, which has impacted the majority of families worldwide. This is necessary to prevent a rise in poverty rates as a result of rising food crop costs. However, rising food costs have long been a political and economically sensitive problem for Canadian policymakers and stakeholders.

1.3 Research Question

This, paper examines the effect of gasoline price on food crop prices. Specifically, the study aims to understand whether barley prices respond to movement in gasoline price with particular attention to Alberta market using data from 1992 to 2022.

The primary research question posed by this study is: How do gasoline prices affect the price of barley in the Canadian province of Alberta? The following individual research questions are then created from this general research question:

1. What was the price trend of barley in the Canadian province of Alberta between 1992 and 2022?

2. How do gasoline price affect the price of barley in Alberta?

1.3.1 Research Objectives

The primary goal of the study is to look at the trends and impacts of gasoline costs on barley prices in Alberta during the past 30 years. The following goals will be pursued in order to achieve this:

1. To investigate the price patterns of barley in Alberta between 1992 and 2022.

2. To ascertain how Alberta's barley prices are impacted by gasoline prices.

1.4 Justification of Study

Price hikes in the Albertan food market have recently raised concerns among a wide range of people, especially consumers and policy makers. Therefore, the purpose of this study is to show whether fluctuations of gasoline price have an effect on the market price of barley.

Most economists are astonished by the recent increases in food costs, which include barley. This reminds stakeholders that all projections are subject to unforeseen outcomes. Forecasts of price trends frequently assume normal trends, unchanging laws, and steady economic growth. By concentrating on the broad trends of the chosen commodity during the study period and how gasoline prices affect the prices of barley, this study is important to fill the knowledge gap in already existing literature considering the impacts of price increases of barley and the subsequent impact on household consumptions in Alberta. The identification of the bases and potential interventions that stakeholders could implement to considerably minimise price variability in order to lessen the impact on households, families, and businesses that rely heavily on barley will be aided by a thorough analysis of this aspect.

1.5 Organization of the report

The remaining sections of the study are organized as follows,

Section 2 outline the literature review. In this section, a comprehensive review of relevant literature and research studies related to the topic were presented, highlighting the current state of knowledge, existing gaps, and theoretical frameworks.

Section 3 presents research methodology. This section describes the research design, data collection methods, and analytical techniques employed in the study. It outlines the sample selection process, data sources, and any limitations or ethical considerations.

In section 4, I presented results and conclusions. This section presents the findings of the research, organized according to the research questions or themes identified. It includes the analysis and interpretation of data.

Section 5 presents conclusion and policy recommendations to the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The recent increase in food prices can be largely related to the rise in gasoline costs. This macroeconomic factor is crucial to every economy since it underpins a variety of activities, particularly those related to agriculture. The structural character of the increases in gasoline and energy prices may be seen in the long-term disparity between rising incremental oil demand and stagnant production and supply.

The agriculture sector is affected by higher oil costs, and the sensitivity has grown as bio-fuel have become more popular. Over the past few decades, agriculture has become more energy intensive. For example, irrigation and fertiliser use both require significant energy inputs to produce high-yielding kinds of food grains (ADB, 2008). In this section, I discussed relevant literature that to support this study.

2.2 Theoretical Framework

According to Lovendal et al. (2007), the demand for commodities has remained largely stable. This is especially true in developed economies, where changes in consumer behaviour are gradual and it is unlikely that price increases will result in lower food consumption. In developed nations, industrial demands also tend to be consistent, with firms only slowly adjusting to price changes. Therefore, variations in supply must be to blame for price volatility. These conditions are probably considerably worse in developing nations where crop diseases and political unrest are widespread. Prices act erratically as a result of the unstable market equilibrium caused by the persistently inelastic demand and the frequent fluctuations in supply. This can also be explained by Price theory, a fundamental idea that examines how prices are established in markets and how people make decisions based on their desires and restrictions, might also help to explain this. It offers insights into resource allocation, market effectiveness, and the effects of market failures, providing as a foundation for economic analysis, policy creation, and comprehending individual and corporate behaviour in market economies.

2.3 Review of Empirical Studies

Despite global efforts and control mechanisms, the ongoing rise in food costs internationally poses a tough problem with far-reaching effects. Governments and organisations have worked valiantly

over the years to address this issue, yet the cost of basic goods has been rising at a slow pace. A comprehensive analysis of the underlying causes, effects, and potential solutions to this situation is necessary. Looking back, the early 1970s saw a startling difference in inflation rates between industrial economies and developing economies. Despite the fact that many developing countries struggled with persistent inflation, industrialised economies saw a higher level of monetary stability. This discrepancy highlights the complexity of the problem by showing how factors such as national conditions and international economic factors interact to affect food prices.

The dynamics of food cost are significantly influenced by oil, the foundation of contemporary economies. Notably, the price of a barrel of oil increased significantly in 2007, going from $54 to $86 in just one year (ESSCR, 2008). The whole food business felt the effects of this sudden increase in oil prices. Higher oil prices have an influence on both the direct costs of producing food and the indirect expenses related to logistics and transportation. As a result, there was a compounded rise in food costs, which put a burden on consumers' budgets and had an impact on the entire supply chain. Research on the rise in food prices has mainly focused on low-income or developing countries, with an emphasis on issues like household and national food security.

This trend has effects that go beyond just higher grocery costs. Prices are impacted by the downstream impacts, which have an impact on the price of commodities and services involved in the production of food. Families and individuals are forced to change their purchasing habits as the cost of living rises. People are compelled to eat less frequently, eat smaller portions, and look for less expensive, less nutrient-dense substitutes. These changes have significant effects on socioeconomic dynamics as well as health. Jones and Sanyang (2008) draw attention to the negative effects of these modifications. They contend that these changes in consumption habits set off a domino effect, with effects ranging from elevated poverty to rising rates of disease and malnutrition. The social fabric of societies is also at danger, which has repercussions for social stability, peace, and cohesion. The interconnection of these effects highlights the pressing need for all-encompassing solutions that take into account not only the current economic problems but also the wider societal ramifications.

Numerous studies emphasise that fuel prices have significant effects on the expenses of agricultural output. Since fuel is a crucial component of agricultural machinery and equipment, rising fuel prices put pressure on farmers. In their investigation of this phenomena, Tokgoz et al.

(2007) found a clear correlation between rising fuel costs and an increase in operating costs, particularly for activities like plough, plant, and harvest. The sensitivity of agricultural operations to abrupt changes in gasoline prices is shown by these findings. Another area where variations in fuel prices a big impact have is transportation costs. According to Ivanic and Martin's (2008) research, high fuel prices can raise the cost of moving agricultural products from fields to markets, which in turn raises the price of food as a whole. In addition, supply chain disruptions brought on by sharp variations in gasoline prices may worsen the issue by resulting in shortages and price volatility (Beghin & Bureau, 2001). This emphasises how susceptible the food supply chain is to outside forces like fluctuations in fuel prices.

Fuel prices have an impact on international trade as well. Because higher fuel prices have an impact on transportation costs and trade routes, they can alter the dynamics of international trade. Following these changes, nations that depend significantly on food imports are more vulnerable. Beghin and Bureau's (2001) research elaborates on how changes in fuel prices might sabotage business partnerships and call for strategic policy solutions.

In conclusion, the ongoing increase in food prices around the world is a complex issue that defies simple fixes. The confluence of elements such as oil prices, global economic dynamics, and consumption patterns makes the problem more challenging despite international efforts and control mechanisms. The disadvantaged people in developing countries are disproportionately impacted by this tendency, which can have a cascading impact on societal stability and public health. To ensure food security and stability for everyone, addressing this challenge demands a comprehensive approach that takes into account economic, social, and policy factors. As time goes on, it will be necessary to work together at the local, national, and international levels to reduce the negative effects of growing food prices.

2.4 Contribution to Literature

The rising expense of food on a global scale has resulted in a variety of negative effects, necessitating a thorough comprehension of its complex causes. Despite significant efforts, there are still a number of research gaps that call for more investigation to gain a deeper understanding of how fuel prices and food costs interact. The influence on middle-income economies shows a substantial discrepancy. The majority of existing research compares industrialised and underdeveloped countries, mostly ignoring middle-income nations. Investigating how these

economies handle changes in gasoline prices and their effects could reveal several tactics. It is necessary to investigate the socioeconomic effects further. While it is known that there are downstream implications on consumption, health, and society, a comprehensive understanding of how these effects emerge in various cultural contexts is lacking.

An inquiry of how changes in gasoline prices impact urban food distribution is prompted by the growth in urbanisation. Understanding this aspect might help us understand how to keep affordable food available in increasingly urbanising places.

The interaction of fuel price dynamics and food production with climate change merits consideration. Developing adaptive methods requires an understanding of the interactions between these components and how they affect agricultural resilience.

Long-term economic sustainability is also worth looking into. Policy choices that strike a balance between short-term alleviation and long-term development can be guided by examining the trade-offs and synergies between short-term interventions and sustainable economic growth.

Last but not least, it is crucial that global value chains remain resilient to changes in fuel prices. Maintaining stability can be better understood by looking at tactics like diversification, other modes of transportation, and localised supply networks.

2.5 Insights from the Literature

Despite worldwide efforts, the rising cost of food presents a challenging situation with broad ramifications. Historical patterns show discrepancies in inflation rates between industrialised and developing nations, illuminating the complex interplay between local and international influences affecting food prices. Oil plays a big part in this problem, and its price explosion in 2007 had a big impact on the supply chains and the production of food. Beyond just affecting the cost of food, the influence has socioeconomic repercussions and changes in consumption patterns. The impact of fluctuating fuel prices on transportation and agricultural production costs has a substantial impact on food prices as a whole. Fuel price fluctuations also disturb international trade patterns, especially for countries that import a lot of their food. Comprehensive measures that take into account sociological and economic factors are needed to address this multidimensional problem. To lessen the negative effects of rising food prices, cooperation is essential.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section discusses the type of data, diagnostic test and models used for the analysis. The study was based on secondary data of price of barley and gasoline price for a thirty-year period at the same frequency.

3.2 Data Description

Quantitative secondary data for Alberta, Canada from Statistics Canada website were used for this study. I analyzed monthly time series data on barley prices and gasoline prices from 1992 to 2022. The data on gasoline price and barley price was obtained from the official website of Statistic Canada. (Statistic Canada, 2023). All data sets on prices are in Canadian dollar.

Table 1 show variable description of the study.

Table 1: Variable description under study

Variable	Acronym	Description
Barley price	Bp	Dependent variable under this study. Its measured in dollars per metric tonne.
Gasoline price	Gp	Independent variable under this study, which is defined as the average provincial monthly prices measured in cents per litre.

In table 2, I present the summary statistics of barley and gasoline prices.

Table 2: Descriptive statistics for barley and gasoline prices from 1992 to 2022.

Variable	Min Price (CAD)	Max Price (CAD)	Mean Price (CAD)	Standard deviation
Barley Price	64.33	411.08	161.35	69.629
Gasoline Price	39.9	186	83.07	28.678

From Table 2, the minimum and maximum price recorded for barley was $64.33 per metric tonne and $411.08 per metric tonne respectively, with a mean price of $161.35 per metric tonne. This implies, there have been a significant increase in price of barley over the period under study. This sharp increase in price mostly affects low-income households since large percentage of their income is allocated for food. Gasoline price on the other hand recorded a minimum and a maximum price of $39.9 and $186 per litre respectively, with a mean price of $83.07 per litre. The difference of the maximum and minimum price of gasoline indicates a significant increase in price over the period under study and it has a positive correlation to barley price.

3.3 Analytical Approaches

Time series graphics and multivariate time series econometric methods were applied to fulfil the research goals. The most significant issue that restricts the use of the ordinary least squares technique to quantify the connection between two or more variables, given a sequence of multivariate data collected over time, is the presence of unit roots. Therefore, before beginning any significant econometric study, I first check for the presence of a unit root.

To explain the interactions and co-movements among multivariate time series variables, a vector auto regression (VAR) model is employed. To explain this model, consider n time series variables $(y_{1t}), \ldots, (y_{nt})$. A multivariate time series is the $n * 1$ vector time series y_t, where i^{th} row of y_t, is (y_{it}). That is, at any time t, $y_t = (y_{1t}), \ldots, (y_{nt})$. Theoretically, it is assumed barley price and food price in general is dependent on gasoline prices and own price history of the commodity under study as summarize as follows:

$$Barley\ price\ =\ f\ (previous\ price\ of\ barley, gasoline\ price)$$

In general, the VAR-X model is expressed in the form,

$y_t\ = c + a_1 y_{t-1} + a_2 y_{t-2} + \ldots + a_p y_{t-p} + e_t$, where c is a $k * 1$ vector of constants (intercepts), y_{t-1} is called the i^{th} lag of y, a_1 is a time invariant $k * k$ matrix and e_t is a $k * 1$ vector of error terms. $y_t\ = \mathrm{f}(y_{t-1}, \ldots, y_{t-\mathrm{p}};\ \mathrm{x_{t\text{-}1}}, \ldots, \mathrm{x}_{t-p} + e_t)$

The presence of unit root in time series data renders the data non-stationary. To address this problem, the first step is to test whether there is the presence of unit root. A statistical test for the proposition that a time series in an autoregressive statistical model has one autoregressive parameter is called a unit root test. That is, in a data series y_t, where t is a whole number, it is modeled by: $y_{(t+1)} = \alpha y_{(t)}$, where α is an unknown constant. A unit root test would be a test of the hypothesis that $\alpha = 1$ (presence of unit root), and the alternate hypothesis is $\alpha < 1$ (absence of unit root). To remove the liner trend and make the data stationary, the first difference is taken. Dickey-Fuller (DF) test method is used for testing for the stationarity. This is a work done by Dickey and Fuller (1979). The basis of the model is to test the null hypothesis that $\alpha = 1$

H_0: Series contain a unit root, $\alpha = 1$

H_1: Series is stationary, $\alpha < 1$

If H_0 is not rejected, it is concluded that, y_t has a unit root so a test is performed until the null hypothesis is rejected.

3.4 Limitation of the Model

To effectively estimate the model parameters in VAR-X models, a sizable sample size is often needed. The model may have substantial estimation uncertainty when there are few observations, which could result in incorrect inference and prediction outcomes.

3.5 Data Processing

Stata software was deployed to run regressions for this study.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results from the analysis and discusses the findings.

4.1.1 Diagnostic Test Results

I first performed a unit root test for stationarity.

The results of the DF test for the levels and first difference are summarized in Table 4.2.

Table 4.2: Results of unit root test

Dickey-Fuller test (1% = -3.450, 5% = -2.875)			
Data	Variable	Test statistic	P value
Levels	Barley price	0.219	0.9733
	Gasoline price	-2.135	0.2306
First difference	Barley price	-17.268	0.0000
	Gasoline price	-17.064	0.0000

The Dickey-Fuller test results of the levels data and the first difference is summarized in Table 4.2. It is clear from the table that none of the variables were stationary at the levels. The level data were differentiated in order to make the series data stationary. The fact that the unit root null hypothesis could not be disproved at the 1% level of significance suggests that the level data is not stationary. This made taking the first difference necessary. The findings of the DF test clearly show that the variables, barley price and gasoline price, achieved stationarity after first differencing.

4.3 Findings

4.3.1 Trends of barley price and gasoline price

This section describes the relationship and trends that exist among gasoline and barley price.

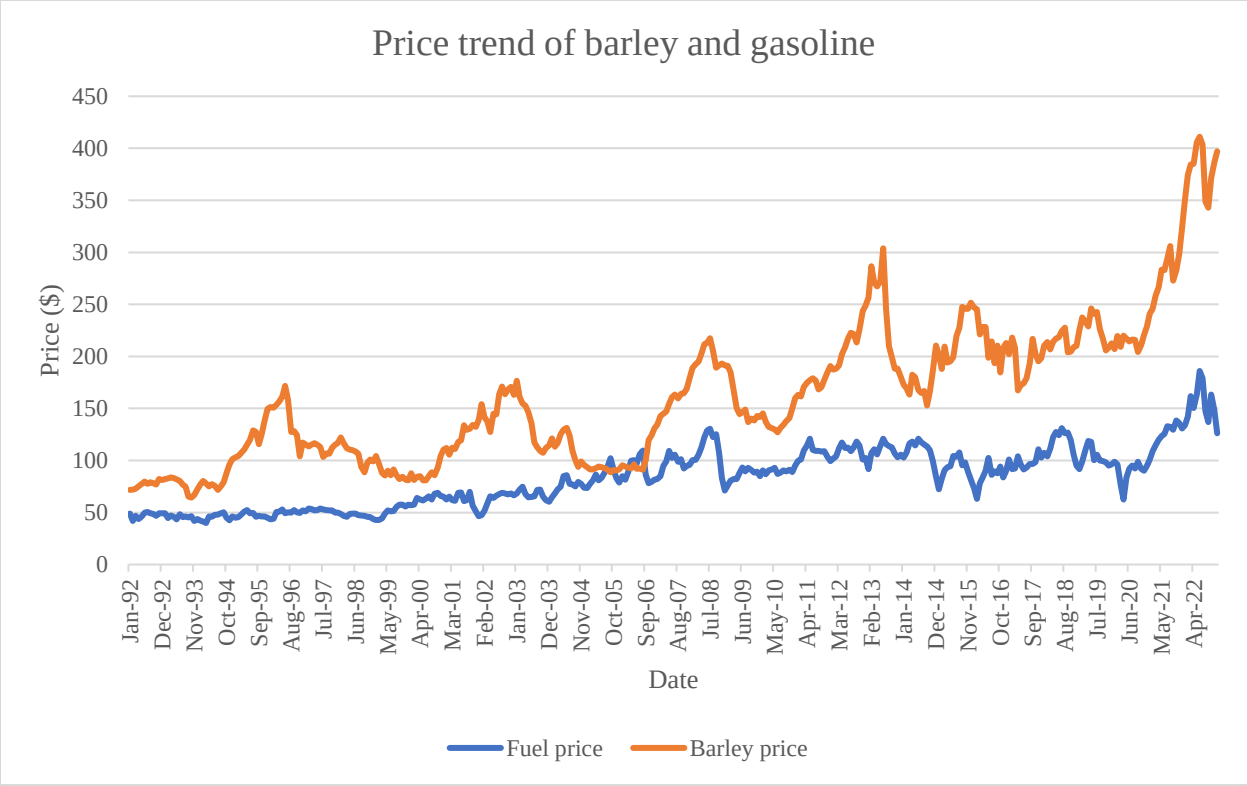

Figure 4.3: Trend of gasoline and barley price

A graphical representation of trends of barley price and gasoline price is illustrated in figure 4.3. Price of barley have shown a significant upward trend over the period under study. However, the trend shows an alternating trend in price. For instance, there was a sharp increase of barley price from January 2007 to January 2008, and then there was a sharp decline from January 2009 to January 2011. The minimum and maximum price recorded was in October 1993 and June 2022 respectively.

Gasoline price on the other hand showed a stead increase over the period under study. However, there are periods that showed fluctuating price patterns. Also, there are periods that recorded a fairly constant price development for some months before it started to fluctuate.

4.3.2 Relationship between gasoline and barley prices

The results presented in Table 4.4 were obtained by regressing gasoline price on barley price to examine the dynamics that exist among the variables.

Table 4.3: Lag-order selection criteria

Lag	LogL	LR	df	p-value	PPE	AIC	HQIC	SBIC
0	-2615.04				4957.97	14.1845	14.1929*	14.2057*
1	-2609.86	10.364	4	0.035	4926.31	14.1781	14.2034	14.2417
2	-2602.03	15.66*	4	0.004	4825.11*	14.1573*	14.1994	14.2633

* Optimum lag

To estimate the relationship between gasoline and barley prices, it is important to choose the right lag-length for analysis in order not to render the model mis specified if its too short or degrees of freedom being wasted if its too long. This test is done to ensure that, there is no autocorrelation at the selected lag. The Akaike (AIC), Schwartz (SBIC) and Hannan-Quinn criteria was used to determine the lag length. The HQIC and SBIC criteria shows an optimum lag length at zero, but AIC criterion shows an optimum lag length at 2. However, since the AIC result have the lowest value compared to HQIC AND SBIC, lag 2 was selected for the regression analysis.

Table 4.4: Impact coefficient of VAR-X on barley price

Dependent variable	Independent variable	lag	coefficient	Standard error	P value
Barley price	Barley price	T_{-1}	0.104	0.052	0.045*
		T_{-2}	0.003	0.052	0.956
	Gasoline price	T_{-1}	0.116	0.085	0.174
		T_{-2}	-0.149	0.086	0.0082*

The results presented in table 4.4 was obtained by regressing barley price on gasoline price to examine the dynamics that exist among them. From the results, barley price is dependent on its own price in the first previous month. Thus, barley price has a positive relationship with its own previous month but have no significant relationship with the second previous month. This implies that, past price of barley has relevant information to help predict current price of barley. At 5 percent significant level, a percentage change in the own price of barley in the previous month will lead to and increase in in the current price by 0.104, holding other factors constant. Gasoline price on the other hand was significant at 5 percent significant level at lag 2. This

implies that, second previous price of gasoline price has significant information to predict current price of barley. That is, a percentage change of the second previous price of gasoline will lead to a decrease of the current price of barley by 0.149, holding other factors constant.

4.3.3 Granger causality test results

The results presented in Table 4.5 were obtained from granger causality test. The results shows if one variable has enough or relevant information to predict the future price of the other variable.

Table 4.5: Granger causality test for barley price

Equation	Wald chi-square	P value
Gasoline price granger causes barley price	5.1143	0.078
Barley price granger causes gasoline price	1.5134	0.469

From the test, it was found that, gasoline does not significantly granger cause the price of barley at 5% significant level. That is, there is not enough information on prices of gasoline to predict future prices of barley. The p-value of 0.078, which is greater than 0.05 indicates gasoline price alone cannot be used to predict future price of barley.

4.4 Conclusion

From the findings, it is evident that, past prices of barley have significant information to used to predict future price of barley. Gasoline prices on the other hand were not found to significantly impact future price of barley, even though the results were statistically significant.

The possible explanation to this could be due to the fact that, most agricultural machineries are built to use diesel instead of gasoline. Also, the time period under study is short, which could be a factor. With this assumption, future studies could use data relating to diesel and on a wider time period. Data on diesel was not used for this study because of data sourcing challenges

CHAPTER FIVE: CONCLUSION

5.1 Introduction

This chapter presents a summary of the study and key findings that were identified. It also highlights on conclusion of the study and it policy recommendations.

5.2 Summary of the study

The study was conducted to examine the trend of gasoline and barley prices and how price of gasoline affects the price of barley in the province of Alberta, Canada from the period 1992 to 2022. To achieve this objective, data was sourced from Statistics Canada official website for analysis. From the study results, it was evident that, current price of barley is dependent on it own price in the first previous month at 5% significant level. Second previous month price of gasoline also has significant effect on the current price of barley at 5% significant level, but not the current price of gasoline. From the findings, we can conclude that past prices of barley and gasoline has relevant information for determining the current price of barley.

5.3 Policy implications

Based on the findings and conclusions of this study, the following policy recommendations are made.

1. Gasoline price should be made more stable to reduce the fluctuations in barley price.
2. Governments should consider introducing price stabilisation methods, such as establishing price floors or ceilings, in circumstances where the own price effect suggests considerable price volatility. Both consumers and producers may benefit from the stability these measures might offer.

5.4 Further research area

Based on the analysis, future study should consider data on diesel, since most agricultural machineries run on diesel. In addition, further research should work on a wider time period.

5.5 Study limitation

The key limitation to this study is time. That is, the time period required to complete this study was short.

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