ANALYSIS OF PRICE OF SELECTED DETERGENT PRODUCTS: A CASE STUDY OF OJA OBA MARKET, ILORIN

BY

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ND/23/STA/FT/0046

BEING A RESEARCH WORK SUBMITTED TO THE

DEPARTMENT OF STATISTICS, INSTITUTE OF APPLIED SCIENCES, KWARA STATE POLYTECHNIC, ILORIN.

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE

AWARD OF NATIONAL DIPLOMA (ND) IN STATISTICS

JUNE, 2025

CERTIFICATION

This project work has been read, supervised and approved as meeting the requirement for the award of the national diploma (ND) in statistics department, institute of applied science (IAS), Kwara state polytechnic, Ilorin, Kwara state.

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DEDICATION

This research work is dedicated first and foremost to the Almighty Allah, and Mr and Mrs Abdulazeez.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to all those who have contributed to the successful completion of this project.

Special thanks go to my supervisor, Mrs Elepo T.A., for his invaluable guidance, patience, and support, may Allah continue to bless you.

I am grateful to the head of department (HOD) Mrs. Elepo. I am also grateful to my lecturers for their insightful advice and encouragement.

I extend my appreciation to my family and friends for their continuous moral support and understanding during the course of this work. Finally, I acknowledge all individuals and institutions that provided resources and assistance that made this project possible.

ABSTRACT

The ever-changing economic environment in Nigeria has had a profound impact on the pricing of consumer goods, particularly household cleaning agents such as detergents. This research project investigates the price fluctuations of selected detergent products within Oja Oba Market in Ilorin, Kwara State. The objectives of the study include comparing the price movements of the selected products, identifying the factors responsible for such changes, and applying statistical indices such as the Laspeyres, Paasche, and Fisher Ideal Price Index to analyze trends.

Keywords: law, Prices changes, commodities, currency.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In the contemporary Nigerian economic setting, household products such as detergents have become essential for everyday living, contributing significantly to sanitation and hygiene. With the population increase and growing consumer demand, the detergent market has witnessed substantial expansion. Detergents, especially in powdered form, are widely used in homes, schools, hospitals, and other institutions. In markets like Oja Oba in Ilorin, detergent products are highly demanded, and their prices fluctuate in response to various economic and non-economic factors.

Why are changes in the cost of living so hard to measure?1 There are literally millions of goods and services available in modern market economies. A single supermarket may contain 30,000 differently priced items and a WalMart store over 40,000. New products are being introduced all the time and existing ones improved, while others leave the market. Relative prices of different goods and services change frequently, for example, in response to technological and other factors affecting costs and quality, which leads consumers to change their buying patterns. As we have become richer, demand has increasingly shifted to services away from goods, and to characteristics of goods and services such as enhanced quality, more variety and greater convenience. Technology and entrepreneurship provide these characteristics. But all these factors, plus others, mean a larger fraction of what is produced and consumed in an economy is harder to measure than decades ago when a larger fraction of economic activity consisted of a smaller number of easier to measure items such as hammers and potatoes. Hence, the very first point the CPI Commission made in its report was that inflation is inherently difficult to measure in a complex dynamic market economy.

The CPI program of the BLS is a large, complex and impressive undertaking. It is staffed by high quality dedicated professionals. We believe most of the problems occur because the rapidly changing nature of our economy puts immense pressure on a statistical system to keep up. Defining what information, one would need and how to use it to obtain an overall summary measure of the level and/or change in consumer prices requires various assumptions and procedures. The first question to answer is: ''What is the domain of consumer expenditures to be covered?'' The CPI program focuses on consumer expenditures on goods and services out of disposable income. Hence, it excludes non-market activity, broader quality of life issues, and the costs and benefits of most government programs. It also excludes saving, which is invested to finance future consumption. Hence, when the forward price of future consumption changes relative to current consumption; for example, when returns available to savers improve because of market forces, deregulation, tax law changes or finance product innovation (such as the widespread availability of low-cost mutual funds), no direct account is taken in the CPI. Second, one has to define the commodities and services the prices of which one wants to measure, how to measure them, how to collect data on them, over what span of time and at what interval, where and when to collect the data, and how to aggregate them into one or several overall summary statistics. At each of these levels, various judgments and assumptions must be made to make practical headway. Some of the Commission's suggested improvements deal with various of these assumptions such as the use of fixed weights. The BLS collects price quotations on 71,000 goods and services, at about 22,000 retail outlets, either monthly or bimonthly. Additional information is obtained on rent and owners' equivalent rent—that is, how much owners are paying in opportunity cost terms for housing services—from about 35,000 rental units. About once a decade the weights for different commodities are derived from the Consumer Expenditure Surveys; for the last decade, weights

were from the 1982–84 period. These data are used to define categories of goods within the index (for greater detail, see BLS, 1992). The CPI price collection goes through a hierarchical or pyramidal process. At the top is the all-item CPI—the overall summary measure of the change in consumer prices from month to month. Next comes a small number of broad commodity groups such as housing, food and beverages, apparel, transportation, medical care, entertainment and other. Each of these categories is subdivided into other categories. For example, housing is divided into shelter, fuel and other utilities, and household furnishings and operations. Each of these subcategories is divided still further; for example, household furnishings into categories such as furniture and bedding, appliances, and so on. The lowest level of aggregation for which an index is calculated by aggregating price quotes is called an item stratum. There are 207 item strata collected in 44 geographical areas, leading to 9,108 strata indexes. Below the strata are entry level items (ELI's), from which specific products are sampled. The basic price quotes, of course, are on actual commodities and services, not on this lowest level of aggregate or ELI. For example, one doesn't go into a store and buy ''apples,'' one buys a specific type and size, like large red Delicious apples. Therefore, the price data on actual commodities purchased in various places must be aggregated to get the strata indexes; for example, apples in Los Angeles. Outlets are chosen and rotated every five years from a Point-of-Purchase Survey, asking consumers where they purchase goods and services, with probabilities of outlet selection proportional to expenditures. There is thus approximately a 20 percent refreshing per year. The prices are collected and compared within outlets. No account is explicitly taken of substitution across outlet types, as might be expected with the evolution of retailing; for example, the widespread use of discount stores in recent years. Within the outlet, the BLS collects prices on specific items, with probability of selection

proportional to sales, and reprices the same item for five years. Often the same item is not in stock in successive months, and a judgment

These fluctuations in price can affect consumer purchasing behavior, market profitability, and overall economic stability. As detergent prices rise or fall, consumers must make choices based on brand preference, affordability, and perceived effectiveness. This study seeks to analyze these price dynamics by focusing on three prominent detergent brands—Viva, Eva, and Ariel.

1.2 Statement of the Problem

There is an observable inconsistency in the pricing of detergent products in Nigerian markets, particularly in Oja Oba Market, Ilorin. While some consumers complain of sharp price hikes, traders cite high transportation and procurement costs as the major cause. These irregularities have raised the need to understand how prices evolve over time, especially for popular brands. This inconsistency not only affects end-users but also poses a problem for market forecasting, retail planning, and consumer welfare.

1.3 The Aim and Objective of the Study.

The main aim of the study is to compare the prices of some detergent products with the following objectives

1. To show the descriptive Statistics of the changes in the prices.
2. To compute and analyze using the Laspeyres, Paasche, and Fisher Ideal Price Indices for these products.

1.4 Research Questions

1. What are the prevailing prices of Viva, Eva, and Ariel detergents in January and May 2025?
2. How do the prices of these detergents compare over the selected periods?
3. What are the major factors influencing their price changes?

1.5 Significance of the Study

The findings from this research will be of great benefit to a variety of stakeholders, including detergent manufacturers, market analysts, consumers, and government regulators. Manufacturers can gain insights into consumer behavior and market pricing, while consumers are better informed about product value. Policymakers and economists will benefit from understanding how microeconomic changes reflect broader inflationary trends.

1.6 Scope of the Study

This study focuses on selected detergent products—Viva, Klin, So Easy, Eva, and Ariel—sold in Oja Oba Market, Ilorin. It covers data from January and May 2025. The price comparison is limited to 1kg packages to ensure uniformity and relevance.

1.7 Limitations of the Study

The research was limited by time, resources, and access to real-time wholesale data. Informal pricing negotiations, which are common in local markets, may have also introduced some degree of inaccuracy in recorded prices.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses existing literature on price variation, consumer behavior, and statistical analysis of market prices. It provides both theoretical and empirical frameworks relevant to understanding pricing trends in the Nigerian detergent market.

2.2 Pricing Theory and Consumer Goods

An exchange rate is the price of a nation's currency in terms of another currency. Thus, an exchange rate has two components, the domestic currency, and foreign currency, and can be quoted either directly or indirectly. In a direct quotation, the price of a unit of foreign currency is expressed in terms of the domestic currency. In an indirect quotation, the price of a unit of domestic currency is expressed in terms of the foreign currency. Exchange rates are quoted in values against the US dollar. However, exchange rates can also be quoted against another nation's currency, which is known as a cross currency, or cross rate (Investopedia, 2018b). Exchange rate and foreign trade are the magic words in the world of business. These Terms are the clearest language to express the economic relations between various countries which are based on common interests. Therefore, the government endeavors constantly to develop advanced scientific methods that can lead towards a better future in the best and distinct manner. The Jordanian government has exerted all possible efforts to develop the methods used in its institutions and departments to achieve the highest standards. They include the Department of Statistics (DoS) and the General Customs Department which are closely associated with the Foreign Trade Division at the (DoS). A number of governmental procedures have been taken to facilitate this process with the aim to help the citizens

and improve planning and economic feasibility of projects by providing a data base on Foreign Trade figures (imports, exports and reexports by category and country and other statistical tables related to transit and Jordan's external trade for several years…etc.), within certain coding and edit rules in order to provide the decision makers and researchers with a comprehensive accurate database (DoS, 2018) The concept of competitiveness in economic literature emerged in its first form under the title of absolute advantage and comparative advantage (Gupta, 2015). It was used to explain the causes of foreign trade and how it could be adopted in international specialization and division of labor. However, developments after the Second World War and with the establishment of the International Monetary Fund, The World Bank and the World Trade Organization, which together formed the third pole in the world economy. This period witnessed the establishment of economic blocs and multinational companies, which led to the emergence of new divisions of international work and showed specialization in more than one country and region. Also, many economies Instead of relying on limited resources of competitiveness they have begun to pursue economic policies aiming to acquire one or several advantages to compete at the international level by encouraging business dynamism and innovation capability. Jordan competitiveness rank for the year 2018 was determined recently in the 2018 edition of Global Competitiveness Report which assesses 140 economies. In 2018, the World Economic Forum introduced a new methodology emphasizing the role of human capital, innovation, resilience and agility, as not only drivers but also defining features of economic success in the 4th Industrial Revolution. As a result, the GCI scale changed to 1 to 100 from 1 to 7, with higher average score meaning a higher degree of competitiveness. The report is made up of 98 variables organized into twelve pillars with the most important including institutions, infrastructure, ICT adoption, macroeconomic stability, health, skills, product market, labor market, financial system, market

size, business dynamism, and innovation capability. Figure 1 shows Jordan competitiveness rank from the year 2010- 2018.

Pricing in economics is defined as the process of determining what a company will receive in exchange for its product or service. For consumer goods, pricing involves several factors including production costs, competition, market demand, and brand perception. In developing countries like Nigeria, pricing is also influenced by inflation, currency fluctuation, and import dependency.

2.3 Price Indices

Price indices are statistical measures designed to show changes in the price level of goods and services over time. The commonly used indices in economic studies include:

- **Laspeyres Price Index (LPI):** This index uses base year quantities and current year prices.
- **Paasche Price Index (PPI):** This index uses current year quantities and both current and base year prices.
- **Fisher Ideal Index (FII):** This index is the geometric mean of Laspeyres and Paasche indices, and is considered the most accurate.

Types of Price Indices

1. **Consumer Price Index (CPI):** Measures the average change in prices paid by consumers for goods and services. It is widely used to assess the cost of living.
2. **Producer Price Index (PPI):** Tracks changes in selling prices received by producers.
3. **Wholesale Price Index (WPI):** Reflects the price of goods at the wholesale level.
4. **Retail Price Index (RPI):** Similar to CPI, but often includes housing costs more explicitly.

2.4 Review of Related Empirical Studies

Studies such as those by Musa (2020) and Okafor (2018) have shown that detergent prices in Nigerian markets are affected by changes in cost of raw materials, inflation, and consumer trends. However, few studies have localized their analysis to specific markets such as Oja Oba in Ilorin, which has unique market characteristics.

Several studies have examined price indices at national and sub-national levels:

- **National Bureau of Statistics (2023)** reports monthly CPI for Nigeria. However, its data often lacks granularity at the local market level.
- **Olayemi (2019)** analyzed market price volatility in Ibadan, highlighting how seasonal changes affect food prices.
- **Ogunbayo and Adebayo (2020)** applied CPI analysis to local markets in Lagos, revealing significant variation in inflation across different commodities and regions.

In Ilorin, few studies have focused specifically on localized price indices, particularly in major markets like Oja-Oba. This gap motivates the present research.

2.5 Uses of Price Index

- Tracking inflation.
- Adjusting wages, pensions, and contracts.

- Economic planning and policymaking.
- Evaluating purchasing power.

2.6 Theoretical Framework

This study is guided by the Law of Demand and Supply and the Theory of Consumer Behavior. The Law of Demand states that, all things being equal, an increase in price leads to a decrease in demand. Consumer Behavior Theory explains how individuals decide on what to purchase based on preferences, income, and available substitutes.

2.7 Summary of Literature

This literature highlights the importance of price indices as economic tools, the various types and calculation methods, and their practical applications. However, there is a gap in localized research, especially within informal markets like Oja-Oba in Ilorin. This study aims to fill that gap using real-time market data.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

The study employed a descriptive and quantitative research design. It focused on real-time pricing and the calculation of price indices to analyze changes over a specific period.

3.2 Population and Sampling

The population consists of detergent retailers in Oja Oba Market. A sample of 20 traders was randomly selected to provide price data and contextual information.

3.3 Data Collection Methods

Primary data were obtained through physical market surveys conducted in January and May 2025. Prices of 1 carton of Viva, Eva, klin, so easy and Ariel detergents were recorded during both visits.

3.4 Analytical Tools

To evaluate price movement, the following formulas were used:

- Laspeyres Price Index (LPI)
- Paasche Price Index (PPI)
- Fisher Ideal Price Index (FII)

These indices help in drawing comparisons and establishing the level of price changes over time.

3.5 Ethical Considerations

- Respondents were informed of the purpose of the study and assured that the data collected would be used strictly for academic purposes.
- Participation was voluntary, and no personal identifiers were collected.
- Verbal consent was obtained from each participant before data collection.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 Price Data for January and May 2025 (₦/carton)

This table below presents the price data collected for selected detergents

Brand	Jan 2025 Carton-Price (₦)	May 2025 carton-Price (₦)	Quantity (Base)	Quantity (Current)
Viva	9000	11000	50	45
Eva	8500	10000	40	35
Ariel	10000	12000	60	50
So Easy	9500	11000	50	45
Klin	10000	12500	40	35

Table 4.1.;

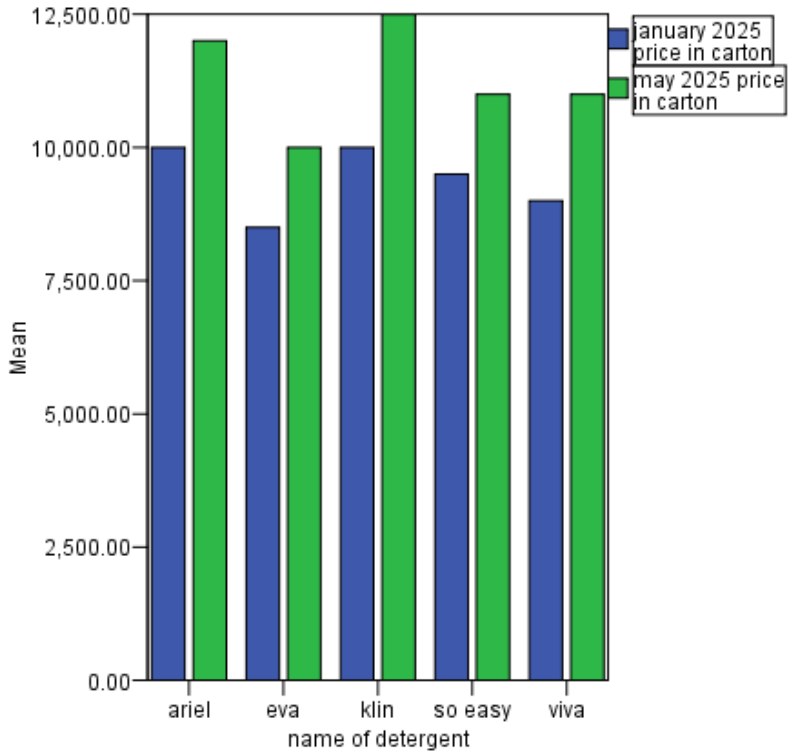

Fig.1

Interpretation: from chart q1 it shows that the detergent (**klin**) has the highest price increase in May 2025

4.2 Laspeyres Price Index(LPI)

LPI = (ΣP1Q0 / ΣP0Q0) × 100
= (550000 + 400000 + 720000 +550000+500000) / (45000 + 34000 + 60000+475000+400000) × 100
= 167000 / 139000 × 100 ≈ 1**20.06**

Interpretation: The laspeyres price index is 120.06. this shows there is an increase in the price of detergents by 20.06% from the base year to the current year.

4.3 Paasche Price Index (PPI)

PPI = (ΣP1Q1 / ΣP0Q1) × 100
= (49500 + 35000 + 60000+495000+437500) / (40500 + 29750 + 50000+427500+350000) × 100
= 144500 / 120250 × 100 ≈ 1**19.86**

Interpretation The Paasche price index is 119.86. this shows there is an increase in the price of detergents by 19.86% from the base year to the current year.

4.4 Fisher Ideal Price Index (FPI)

FPI = √(LPI × PPI) = √(120.06 × 119.86) ≈ 1**19.96**

Interpretation: The fisher price index is 119.96. this shows there is an increase in the price of detergents by 19.96% from the base year to the current year.

4.5 Interpretation of Findings

From the analysis, all detergent brands showed an increase in price from January to may2025. This suggests an overall inflationary trend in detergent prices detergent prices during this period, possibly due to economic factors like supply costs, fuel prices or currency fluctuation

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Conclusion

The prices of all detergents have risen from January to May 2025.

All three price indices—Laspeyres, Paasche, and Fisher—confirmed an approximate 19.96% increase.

Key factors identified include rising cost of raw materials, transportation costs, brands perception, and inflation.

The Paasche price index is 119.86. this shows there is an increase in the price of detergents by 19.86% from the base year to the current year.

The fisher price index is 119.96. this shows there is an increase in the price of detergents by 19.96% from the base year to the current year.

The laspeyres price index is 120.06. this shows there is an increase in the price of detergents by 20.06% from the base year to the current year.

5.3 Recommendations

i. **For Manufacturers:** Explore cost-effective production methods to stabilize product prices.
ii. **For Retailers:** Offer a diversified product range to meet consumer affordability.

iii. **For Government:** Implement policies that control inflation and support local manufacturers.

iv. **For Future Researchers:** Expand the study to include more markets and product categories for broader analysis.

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