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Recent Trends and Patterns of Gasoline Consumption in Nigeria

Chioma Yingigba Jaja*

Abstract

This article analyses recent trends and spatial patterns of gasoline consumption in Nigeria. In particular, it shows that the volume of gasoline consumption in the country fluctuates with changes in economic growth. The pattern of distribution of gasoline consumption indicates that the largest consumption centres are in the South-West and South-South geopolitical zones of the country, specifically Lagos, Oyo, Ogun, Edo, Rivers and Delta States. Other locations of high gasoline consumption are Kaduna, Kano, Imo states and Abuja (Federal Capital Territory). Compared with a previous study, the four additional centres identified are Ogun, Delta, Imo States and Abuja (FCT). Results of the multiple regression analysis show that the spatial variation in gasoline consumption is related to the number of gasoline-using vehicles newly registered and per capita income in the states. The study provides a framework for the development of meaningful policies for the reduction of transportation-related energy consumption.

Résumé

Cet article analyse les récentes tendances et variations spatiales de la consommation d'essence au Nigeria. En particulier, l'article montre que le volume de consommation d'essence dans le pays varie en fonction des changements de la croissance économique. Le réseau de distribution de de l''essence indique que les plus grands centres de consommation se situent dans les zones géopolitiques Sud-Ouest et Sud-Sud du pays, en particulier dans les Etas de Lagos, Oyo, Ogun, Edo, Rivers et Delta. Les États de Kaduna, Kano et Imo et Abuja (Territoire de la Capitale Fédérale- FCT) sont aussi d'autres lieux de

* Department of Geography, University of Ibadan, Ibadan, Nigeria.
E-mail: chiomajaja@yahoo.com

forte consommation d'essence. Comparés à une étude précédente, les quatre centres supplémentaires identifiés sont les États d'Ogun, de Delta, d'Imo et d'Abuja (FCT). Les résultats de l'analyse de régression multiple montrent que la variation spatiale de la consommation d'essence est relative au nombre de véhicules utilisant de l'essence nouvellement immatriculés et au revenu par habitant dans les États. L'étude offre un cadre pour l'élaboration de politiques efficaces pour la réduction de la consommation d'énergie liée aux transports.

Introduction

Transport is a key element in the social and economic development of any country An efficient transport system provides access to points of employment, health and education. It facilitates the development of a country's market, transforming local markets into national, regional and international areas. However, despite the important contributions of transport to national development, the environmental and social costs of transport are significant. Transport systems degrade the quality of life and undermine urban productivity. Their range of impact includes congestion, high energy consumption, local and global air pollution, noise pollution, traffic accidents and social inequities.

Transportation accounts for approximately 25 per cent of world energy demand and more than 55 per cent of oil used each year. Transportation is almost completely reliant upon petroleum products, with the exception of railways using electrical power (Lenzen, Day and Hamilton 2003). Globally, energy consumption in the transport sector has increased. Noted that world energy use in the transport sector grew on average of per cent per year. This energy consumption contributes to greenhouse gas emissions and presents an economic burden especially in countries that import energy resources.

In Nigeria, more than 75 per cent of energy consumption is in the transport sector. Households and industry account for a large share of the remainder. Petroleum products consumption rose ninefold from 28,000 barrels in 1970 to 236,000 barrels a day in 1982. The recession in the post-1982 period was accompanied by a decline in the level of demand to 196,300 barrels in 1986. However, there has been a steady increase since then. In 2003, petroleum products consumption amounted to 430,202 barrels per day.

A breakdown of energy consumption among various modes of transport shows that highway traffic is by far the single largest consumer of transportation energy. This is because at present, the principal means of transporting people and goods are private cars and commercial vehicles. The concern over road transport is in respect of its contribution to carbon dioxide emission resulting in changes in the earth's climate. Climate change is occurring in the context of increased anthropogenic stress across a range of natural systems, examples being stratospheric ozone depletion, sea-level rise, loss of biodiversity, spread of invasive species, exhaustion of wild fisheries and the depletion of freshwater supplies.

The key factors in the rapid growth of transportation energy consumption are subsidised and administered energy prices. The high level of consumption in recent years, inflated by smuggling and use of generators for power supply, has been sustained by low product prices. In the transport sector, high energy consumption is also due to the use of inefficient second-hand vehicles, poor road conditions and inefficient urban mass transit and railways. Transport energy consumption has a strong correlation with the level of development. Growth in economic activity and population are major factors that influence energy demand. Economic growth spurs growth in industrial output, which requires the movement of raw materials to manufacturing sites as well as the movement of manufactured goods to end users. Increased economic activities expand per capita income and as the standard of living rises, demand for personal transportation increases. This is because the value of time increases with income, offsetting the higher monetary costs of faster modes, thereby increasing demand for the automobile and energy consumption.

Population size affects the range of local jobs and services that can be supported and the range of public transport services which can be provided. Population size is a proxy measure of accessibility and urban structure. Giuliano and Narayan (2003) indicate that smaller areas that are unable to support a large range of services and facilities may force residents to travel longer distances in order to access the services they require. Very large, centralized settlements may on the other hand also lead to longer travel distances as the distance between homes and urban centres becomes large. Several studies (for example, Orfeuil and Salomon 1993 and Breheny 1995) show that areas with low population size are associated with long trip distances and high transport energy consumption while short distances and low transport energy consumption are observed in large cities.

When measured at a sufficiently disaggregated level, population density has proven to be an effective proxy for intra-metropolitan spatial structure (Pushkarev and Zupan 1977; Neimener and Butherford 1994; Schimek 1996). High density is a surrogate for greater transit availability, more walkable environments, mixed use and high accessibility. Low density is a surrogate for low accessibility (Giuliano *et al*. 2003). Newman and Kenworthy (1989) claim support for the argument that denser cities result in lower per capita gasoline consumption.

Industries that make use of motorised equipment use gasoline for various production processes. It is, therefore, hypothesised that the greater the number of firms in a given place, the more gasoline that location may consume. The gasoline consumption capacity of vehicles varies. Thus, it is expected that states with high numbers of vehicles with large gasoline capacity will have higher levels of gasoline consumption than those with less such vehicles. The number of gasoline-using vehicles registered in each state is a proxy variable for the total number of vehicles operating within each state. However, vehicles registered in each state are by no means the total number in circulation. This is because some people register their vehicles outside their state of residence either for social identification with their place of origin or to reduce the cost of registration.

Construction and improvement in the quality of road networks is usually necessitated by an increased number of vehicles. Consequently, areas with high road length are assumed to have a high number of vehicles and high transport energy consumption. At the other extreme, there are many minor roads in remote parts which carry low traffic. At household level, work status has been shown to have significant effect on journey frequency. Journey frequency increases as the number of workers per household increases (Ewing *et al.* 1996). Thus, areas with high numbers of people employed have high trip frequency and consume more energy for transportation.

Sustainable development has become a major issue after the publication of the Bruntland Report (WCED 1987) and after the relevance that Agenda 21 has given it (United Nations 1992). In the former, it is defined as 'development which meets present needs without compromising the ability of future generations to achieve their own needs and aspirations'. From this perspective, the debate about the research for sustainable transport has strengthened. Sustainable transportation concerns systems, policies and technologies that aim for the efficient movement of people, goods and services. These include the use of fuel-efficient vehicles, design of cities with compact urban form and bicycle-friendly neighbourhoods, increased prices of petroleum products and use of bio-fuel.

This paper analyses the spatio-temporal pattern of gasoline consumption in Nigeria. The study uses multiple regression analysis to investigate the relationship between gasoline consumption, geographical and economic factors. The rest of the paper is structured as follows: Section 2 presents a review of studies on gasoline consumption in Nigeria. This is followed in Section 3 by the research methodology, while Section 4 examines the trends and analyses the spatial pattern of gasoline consumption. The conclusions are presented in Section 5.

Literature Review

Research on the petroleum industry in Nigeria has focused on the effects of petroleum on the economy and activities related to the exploitation of the resource, the economics of production and distribution of crude oil, the policy implications of the dominance of foreign oil companies, the demand for gasoline, the impact of inefficient pricing policy on the macro-economy, and the environmental impact of oil production. The studies by Robinson (1964), Schatzl (1969), Pearson (1970) and Ikoku (1972) discussed in part the economic importance of petroleum to Nigeria. Adegbulugbe *et al.* (1986) analysed the demand for gasoline using economic models of pooled cross-section and time series, while Adenikinju (1995) examined the impact of an efficient energy pricing policy on the macro-economy. Odu (1972, 1977a, b), Oyefolu *et al.* (1979), Imevbore (1979), Kinako (1981) and Ikporukpo (1983) examined various aspects of the environmental impact of oil production.

Perhaps the study by Ikporupko (1978) on the consumption pattern of gasoline and the efficiency of the organisation of the gasoline distribution system provides a good starting point on the detailed studies of gasoline consumption in Nigeria. Over the years, however, little, if any, attention appears to have been paid to the emerging pattern despite the geo-political restructuring of the country and the various economic reforms that have taken place. This paper thus presents an update of the spatial and temporal patterns of gasoline consumption in the country between 1971 and 2005. In addition, it examines the factors responsible for spatial variation in the demand for gasoline.

Data and Method

Data on gasoline consumption in the thirty-six states of Nigeria were obtained from the *Annual Statistical Bulletin* of the Nigerian National Petroleum Corporation for the period 1971-2005. This was to provide a general overview of gasoline consumption and an insight into changes which may have occurred since Ikporupko's study (1978). Data on new registration of gasoline-using vehicles by state, population size, per capita income, population density, distribution of employed population, length of roads in each state, motor vehicles newly registered by state and number of industrial establishments in each state were collected for the period 1971-2005 from the *Annual Abstract of Statistics* published by the Nigerian Bureau of Statistics. However, due to inconsistency in the availability of data for some of the variables for the entire period, the analysis uses the mean of the total of each variable for the period for which data were available.

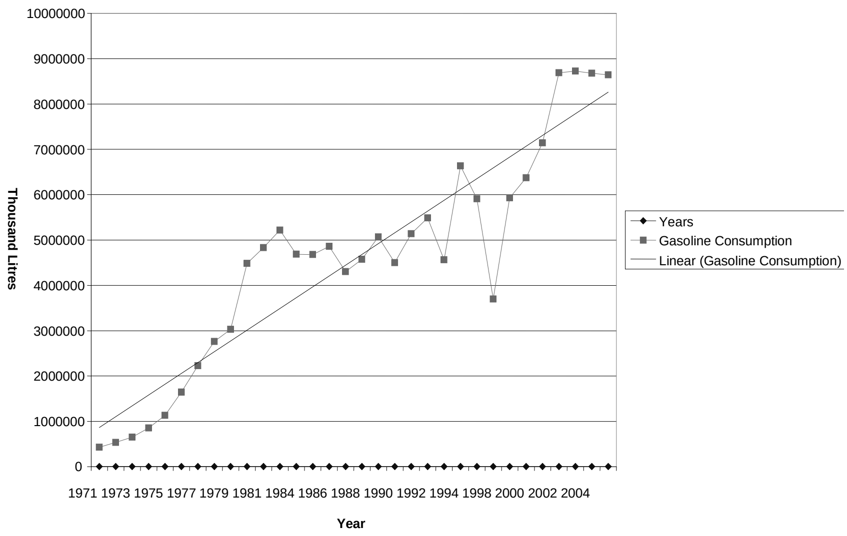
The data collected for the states were adjusted accordingly, given the fact that geographical changes have occurred in the country over time. In 1977, there were 19 states and Abuja (Federal Capital Territory) as seven new states had been created and the names of some existing states had been changed. Two additional states were created in 1987 and in 1991, nine states were added. By 1996, six more states were created to make a total of thirty-six states and Abuja (FCT). Data for new states were estimated from the data for the states from which they were created. To achieve this, the political map of Nigeria for 1963, 1967, 1976, 1987, 1991 and 1996 were digitized and overlaid to ascertain the proportion of the each new state contained in the old state. The computed proportion was used to calculate the percentage of the new state contained in the old state. The value obtained was then subtracted from the old value to give the percentage of the old and new states. For example, Oyo State constitutes 50.6 per cent of the areal size of the old Western Region in 1967. In 1991, Oyo was itself divided into two states, namely, Oyo (74.9%) and Osun (25.1%). These percentages were used to estimate gasoline consumption values for Oyo and Osun states from the various secondary data obtained for the study.

Trends in the Consumption of Gasoline

Temporal Trends

The consumption of gasoline in Nigeria for the 34- year period from 1971 to 2005 for which data are available displays three distinct phases (Figure 1). In the first instance, consumption rose from 427,937 litres in 1971 to a peak of 5,219,957 litres in 1983, an increase of 1,120 per cent. The key factors in this rapid growth in gasoline consumption were the rapid income expansion due to strong oil export performance and subsidized energy prices. The second phase, 1984-1998, was marked by fluctuations in consumption of gasoline. The economic recession in the post-1982 period was accompanied by a decline in the level of demand culminating in the sharp fall from 5,219,957 litres in 1983 to 4,302,174 litres in 1987, a decrease of 17.5 per cent. This coincided more or less with the economic depression consequent on the two-thirds fall in world crude oil prices within the first six months. Consumption of gasoline increased from 4,565,852 litres in 1993 to 6,635,302 litres in 1994, an increase of about 45 per cent. There was a sharp decline from the volume consumed in 1994 to 3,699,547 litres in 1998, representing a decrease of about 44 per cent. After this sharp decline, gasoline demand increased steadily to a peak of 8,725,938 litres in 2003 (a 135% increase from 1998) which is the peak level of consumption throughout the period under consideration. Consumption levels then stabilised between 2004 and 2005 when 8,676,812 and 8,644,260 litres were consumed respectively. The general growth in the economy may have been responsible for this increasing trend in gasoline consumption, as there is usually a close relationship between energy use and economic development (Naess *et al.* 1995).

Figure 1: Gasoline Consumption in Nigeria 1971-2005



Spatial Trends

The pattern of variation in gasoline consumption from one state to the other in Nigeria for a 34-year period is examined here. The states are subdivided into six geopolitical zones so as to make the variation over space more evident. The pattern in the South-East zone, which comprises Abia, Anambra, Ebonyi, Enugu and Imo states, indicates a rise in the consumption of gasoline in all the six states from 1971 to a peak in 1980. This was followed by a fall in 1981 and fluctuations between 1981 and 1990. There was a marked increase in consumption in 1992, followed by a gradual decrease between 1993 and 1999. Consumption levels increased steadily from 2000 to 2005, although there was a fall in 2003. For the entire period, Imo State had the highest level of consumption of gasoline with 2,582,727 litres (26%) followed by Enugu State with 2,490,543 litres (25.4%). Anambra State had the lowest level of gasoline consumption with 1,414,415 litres (14.4%).

The South-South zone comprises Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers States. Consumption of gasoline increased in all these states between 1971 and 1981. After 1983, the pattern shows a series of increases and decreases in gasoline demand in most of the states. Generally, between 1971 and 1992, Edo State had the highest level of gasoline consumption in the zone. There was a significant rise in consumption level in Rivers State from 69,971 litres in 1990 to a peak of 420,361 litres in 2004 (a 500% increase). Thus, Rivers State had the highest level of gasoline consumption between 1997 and 2005. Edo and Rivers states consumed a total of 3,815,737 and 3,674,979 litres of gasoline in the entire period, representing 25.4 and 24.5 per cent respectively of the total gasoline consumed in the zone. Demand was lowest in Akwa Ibom State with 638,746 litres being consumed.

There was an increase in gasoline consumption in all the states of the South-West zone (Ekiti, Lagos, Ogun, Ondo, Osun and Oyo states) between 1971 and 1983. This is followed by fluctuation in demand up to 2005. However, a marked feature in the zone is the fact that Lagos State had the highest consumption level throughout the period. From a minimum level of 122,724 litres in 1971, gasoline demand increased to 1,366,301 litres in 1993 (a 1,013% increase). This was followed by a decline in 1997 to 952,777 litres (a decrease of 30%). After 1997; there was a steady rise to a peak of 1,852,267 litres in 2003, representing an increase of 1,409 per cent of the value in 1971. Hence, for the entire period, major consumption areas were Lagos and Oyo states with 24,200,352 litres (59.3%) and 6,260,901 litres (15.3%) while Ekiti had the lowest volume of gasoline demand in the South-West zone with 711,338 litres (1.7%).

The North-Central zone comprises Abuja (Federal Capital Territory), Benue, Kaduna, Kwara, Kogi, Nasarrawa, Niger, and Plateau states. Kaduna State dominated gasoline consumption in the zone between 1971 and 2000. Abuja had the highest consumption level between 2001 and 2005 with a peak volume of 486,288 litres in 2003. The predominance of Abuja during this period is due to an increase in vehicular traffic in the FCT occasioned by an increase in commercial activities and the transfer there of major government parastatals. The major consumption areas in the zone for the period are Kaduna State with 4,832,045 litres (28.2%) and Abuja with 2,656,821 litres (15.5%) while Kogi State had the lowest level with 1,282,837 litres (7.5%).

There was a rise in the consumption level in the six states (Adamawa, Bornu, Bauchi, Gombe, Taraba and Yobe) of the North-East zone between 1971 and 1981. Bornu State had the highest demand in 1981 with 124,695 litres. The period after 1981 was marked by the rise and fall in gasoline demand in all the states. Generally, Bornu State had the highest level of consumption with 1,573,996 litres (29.6%) followed by Bauchi State with 964,984 litres (18.2%) while the lowest demand was recorded in Gombe State with 416,026 litres (7.8%).

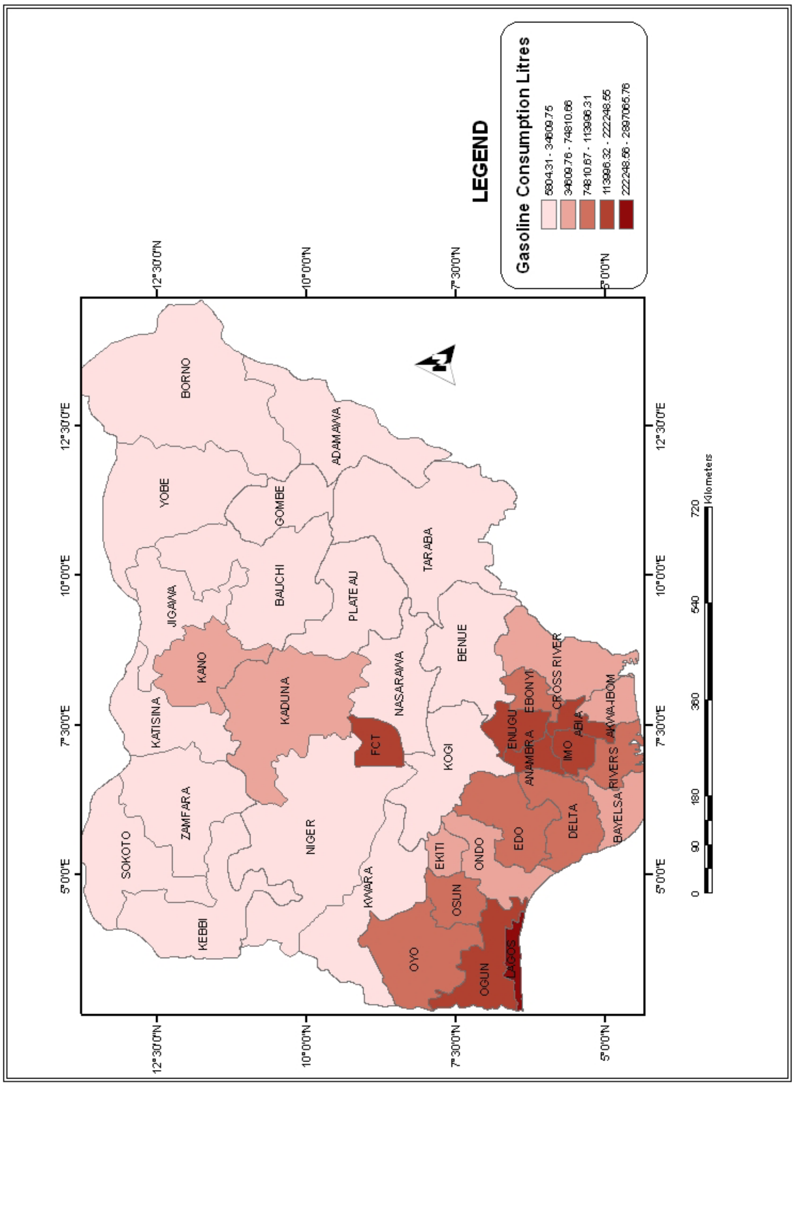
The North-West zone comprises Jigawa, Kano, Katsina, Kebbi, Sokoto and Zamfara states. There was a rise in gasoline consumption in all the states from 1971 to 1981, after which there was fluctuation in demand until 2005. Jigawa had the highest consumption level between 1971 and 1992 with a peak of 181,918 litres in 1989. Demand in Kano rose from 124,370 litres in 1992 to a peak of 299,223 litres in 2002, representing a 140 per cent increase. Thus, Kano State had the highest gasoline consumption from 1993 to 2005.

The high demand in Jigawa State may be attributed to the derivation of its consumption values from those of Kano State from 1971 to 1992. For the period, 1971-2005, Kano State had the highest gasoline demand with 3,356,553 litres (38.7%) while Kebbi had the lowest with 684,517 litres (7.9%).

The spatial pattern of gasoline consumption at state level (Figure 2) shows that Lagos State had the highest consumption level with 24,200,351 litres (25%) followed by Oyo (6.5%), Ogun (5.4%), Kaduna (5.0%), Edo (3.9%), Rivers (3.79%), Delta (3.79%), Kano (3.5%), Abuja (2.7%) and Imo (2.7 %). Therefore, the largest consumption centres are in the South-West and South-South zones.

Since Ikporupko (1978), four new major consumption centres have been identified, namely, Ogun, Delta and Imo states and Abuja (FCT). Gasoline consumption in these states has increased tremendously since 1974 due to growth in population, administrative, commercial and industrial activities, especially in the FCT. Some of the major consumption centres identified by Ikporukpo (1978) represent the state capital of the largest consumption centres identified in this study: Lagos (Lagos State), Ibadan (Oyo State), Benin (Edo State), Port Harcourt (Rivers State), Kano (Kano State) and Kaduna (Kaduna State). This is because a high percentage of the population and socio-economic activities in each state are concentrated in the capital cities.

Figure 2: Gasoline Consumption in Nigeria



The analysis of variance technique was used to analyse the spatial distribution of gasoline consumption in the country. The F-value of 56.933 is significant at a 5 per cent level. This indicates that there is a significant difference in the spatial variation of gasoline consumption in Nigeria over the years under consideration. This significant variation in the spatial pattern of gasoline consumption is attributable to the pattern of development. The larger consumption centres are either administrative, industrial or commercial centres and, of necessity, consume a lot of gasoline.

Determinants of the Spatial Pattern

In the preceding sections, the variations in gasoline consumption over space and time were discussed. This section seeks to determine the precise nature of the relationship between the volume of gasoline consumed and explanatory variables. Although the factors identified as explaining demand here relate mainly to variation over space, these factors may also apply to variation over time.

In this study, the choice of explanatory variables has been influenced mainly by the theoretical and practical relevance to the Nigerian situation and the availability of data. Eight variables were selected, namely, population size, population density, per capita income, vehicle registration, number of industries, new registration of gasoline-using vehicles, length of roads, and number of people employed in each of the thirty-six states in the country.

Multiple Regression Model

The step-wise multiple regression equation which expresses the relationship between gasoline consumption and various predetermined independent variables is expressed as follows:

$$Y= a+ b1x1+b2x2+b3x3+b4x4+b5x5+b6x6+b7x7+e$$

Where Y = gasoline consumption in the states (dependent variable)

a = Y intercept, it indicates the value of Y when X = 0

X1 = population size

X2 = new registration of gasoline-using vehicles

X3 = per capita income

X4 = number of industrial establishments

X5 = population density

X6 = number of people employed

X7 = vehicle registration

X8 = length of roads

e = an error factor or stochastic disturbance term

b1-b7 = regression coefficients

In the equation, all the explanatory variables are hypothesized as having a positive and linear relationship with the dependent variable.

Results and Discussion

Given that the variables were measured on different metric (length of roads in kilometres, etc) it is important first to reduce the variables to the same measurement. This was done by converting the values to logarithm base 10. The correlation coefficients of all the independent variables are positive and significantly related to gasoline consumption at 1 per cent and 5 per cent significance level, with the exception of length of roads. This implies that gasoline consumption increases as population size, population density, per capita income, number of industries, new registration of gasoline-using vehicles and number of people employed increase. Table 1 shows that new registration of gasoline-using vehicles has the highest correlation with gasoline consumption (0.729) while length of roads has the lowest correlation coefficient. In addition, the correlation analysis indicates a high degree of linear interdependence among the independent variables. Multicollinearity among these variables may result in an imprecise estimation of coefficient estimators. One possible solution to this problem is the application of principal component analysis, a technique used for collapsing a set of intercorrelated variables into a smaller or same number of uncorrelated dimensions or variates. The technique is useful in a situation where the number of explanatory variables that are theoretically relevant in a regression model is very large relative to sample size. Principal component analysis would help create new and fewer variables or make a selection from the old set of variables that could be used in the regression analysis. The method could also be used when there is a high degree of multicollinearity in a data set and the research interest is in determining the fewer set of variables that could be used in the regression analysis (Ayeni 1995).

Table 1: Correlation Matrix of Gasoline Consumption and Independent Variables

Variable	Y	X1	X2	X3	X4	X5	X6	X7	X8
Y	1	0.349	0.729	0.666	0.727	0.446	0.521	0.702	0.326
X1		1	0.659	0.043	0.460	0.406	0.835	0.613	0.633
X2			1	0.304	0.553	0.378	0.649	0.854	0,.464
X3				1	0.463	0.312	0.294	0.256	0.115
X4					1	0.628	0.497	0.561	0.236
X5						1	0.556	0.484	0.048
X6							1	0.598	0.647
X7								1	0.375
X8									1

The result of the principal component analysis on the eight variables in Table 2 shows that only two components have an eigenvalue that is greater than one. This implies that only two components were extracted.

Table 2: Eigenvalues of the Correlation Matrix

Components	Eigenvalues
1	4.384
2	1.334
3	0.794
4	0.664
5	0.370
6	0.236
7	0.125
8	0.092

Table 3 shows how the variables correlate with the components and the relative importance of each component. The first component accounting for 41.43 per cent of the total variation has a high correlation with the number of people employed, new registration of gasoline-using vehicles, vehicle registration, and population size. On the other hand, the second component, which accounts for 30.05 per cent of the variation, has a high correlation with per capita income only. Thus, the two components account for 71.48 per cent of the variation in the original data. The first component is named demographic and motorisation factor while the second component is named economic factor.

Table 3: Principal Components and Factor Loadings of the Correlation Matrix

	Component 1	Component 2
Volume of gasoline (litres)	0.882	-0.193
Population size	0.853	-0.064
New registration of gasoline-using vehicles	0.834	0.025
Per capita income	0.831	-0.392
Number of industries	0.738	0.444
Population density	0.642	0.483
Number of people employed	0.608	-0.585
Vehicle registration	0.408	0.606
Eigenvalue	4.384	1.334
% of Variance	41.43	30.05
Cumulative %	41.43	71.48

The result of the regression analysis (Table 4) using the component scores as independent variables against the dependent variable (gasoline consumption) show that the multiple correlation coefficient (R) is 0.825 and R^2 is 0.68. This implies that 68 per cent of the variation in gasoline consumption is explained by the independent variables. With an F value of 36.345, the model is significant at 0.001 significance level.

Table 4: Summary of Regression Model of Component Scores and Gasoline Consumption

Model		Unstandardized Coefficients								
		B	Std. Error	Beta	t	Sig.	R	R^2	F	Sig.
1	(Constant)	4.813	.033		147.385	.000	0.825	0.681	36.34	0.000
	Component Score 1	.131	.033	.382	3.943	.000				
	Component Score 2	.250	.033	.732	7.559	.000				

Table 5: Summary of Regression Model of Components and Gasoline Consumption

Model					Unstandardized Coefficients					
Model		Unstandardized Coefficients								
		B	Std. Error	Beta	t	Sig.	R	R^2	F	Sig.
1	(Constant)	1.237	.901		1.373	.179	0.866	0.75	32.924	0.000
	PopulationEmployed	.001	.178	.000	.003	.998				
	Gasoline-using vehicles	.508	.101	.580	5.006	.000				
	Per capita income	.676	.127	.490	5.312	.000				

Furthermore, regression analysis using the components with high correlations as independent variables against the dependent variable reveal that the t-values for new registration of gasoline using vehicles and per capita income are 5.006 and 5.312 respectively (Table 5). These t-values are significant at 0.005 significance level. Thus, new registration of gasoline using vehicles and per capita income are significant in explaining the spatial variation of gasoline consumption in the country.

Conclusion

This article has analysed the trend and spatial pattern of gasoline consumption in Nigeria. The attempt at building an explanatory model of gasoline consumption constitutes perhaps the most significant part of this work. In doing this, not only have other related works been reviewed, but the effect of development on gasoline consumption has been discussed. To ensure a high degree of credibility in the model, an effort was made to recognise some basic assumptions in the effective use of multiple regression models.

The consumption of gasoline in Nigeria displays three distinct trends. There was rapid growth between 1971 and 1983, followed by fluctuations between 1984 and 1998. After this period, gasoline demand increased steadily to a peak in 2003 and stabilized between 2004 and 2005. The spatial pattern of consumption indicates that the largest consumption centres are in the South-West and South-South zones. Lagos State has the highest consumption level followed by Oyo, Ogun, Kaduna, Edo, Rivers, Delta, Kano, Abuja and Imo States. Since the work of Ikporukpo (1978), four additional major consumption centres have emerged, namely, Ogun, Delta, Imo States and Abuja (FCT). The spatial distribution of gasoline consumption is significantly explained by new registration of gasoline-using vehicles, number of industries and per capita income. Indeed, the number of newly registered, gasoline-using vehicles in the states is the most significant explanatory variable.

In addition, by identifying the basic factors of demand, this paper provides a framework for the development of meaningful policies for reducing gasoline consumption in the country. It also provides the basis for forecasting the gasoline needs of specific locations and the country in general. This is important as the lack of effective forecasting has in various instances been instrumental in the problem of petroleum product shortages in Nigeria.

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