

Analysis of Economic Factors Affecting Household Private Final Consumption Expenditure in India

Jahanvi Khurana¹, Susanto K Beero²

Abstract: *Since consumer is the key driver of demand and consumption in a developing economy like India, it is important to examine Private final consumption expenditure by households and the factors affecting it. In this context, the paper analyses commodity wise Private final consumption expenditure done by households on 11 categories from 1980- 2020 and did descriptive analysis using averages, percentages, and compound annual growth rate. It also empirically evaluates the effect of Population, Real savings, Real disposable income, Inflation (CPI as a proxy) and Deposit interest rate for 1 to 3 years on Private final consumption expenditure by households using multiple linear regression. The results depict increase trend and the changing basket for expenditure done by households and the study provides evidence that there exist a significant and positive relationship in Disposable income, Inflation, Population and Private final consumption expenditure whereas, Real savings and Deposit interest rate indicates a negative linear relationship with it.*

Keywords: PFCE, Income, Savings, CPI, Multiple linear regression

1. Introduction

India being the second most populous country in the world, with a market potential more than most of the countries. Presence of consumers and their needs and desires gives birth to demand which is met by consumption of goods and services by them. Consumption is the main criteria for an economy's demand, served as a fundamental determinant of an economy including affordability, inequality, and the similar ones. The household sector engages in consumption as one of its key activities. Any income received, from any source, is either used for consumption or saved. It is one of the most effective indicators of a society's economic, political, and social situation at a particular point in time or over time are its consumption patterns. Consumption can happen through various agents within an economy. Two broad components are private consumption and government consumption. We will study about Private final consumption expenditure by Households in this paper. Private final consumption expenditure by household deals with expenditure done by the households for all types of commodities including Food and Non - food categories.

Assessment of factors affecting household consumption is crucial for India's economic policy changes. On the factors that influence consumption, there have been disagreements. As a result, various consumption theories and hypotheses have been developed in the literature. Keynes characterized consumption as a positive function of income in his Absolute Income Hypothesis (AIH). This suggests that a rise in income will inevitably result in a rise in consumption. The role of interest rate in influencing consumption has been captured in various studies. A rise in interest rates will, however, encourage households to save in order to benefit from the increase. As a result, the marginal inclination to save rises, leaving less available for consumption. But since it is unlikely that an increase in income will lead to a 100% rise in consumption, Keynes developed the idea of the marginal propensity to consume (MPC), which quantifies how quickly consumption will change in response to a change in income. Through its impact on real income, inflation can affect household consumption spending; both inflation and inflation expectations have the potential to

influence private consumption significantly both in terms of absolute consumption and its commodity structure. The households anticipating greater inflation are more likely to purchase durable goods than those anticipating constant or declining inflation.

Let us discuss about the studies done on different factors influencing household expenditure. As already mentioned, income is an essential factor for consumption so there are many studies analyzing the relationship between income and disposable income on household consumption in different countries and using different methods. Zeynalova (2020) examines household consumption expenditure and the economic factors affecting it, disposable income and other income related factors income tax, corporate tax, exchange rate and VAT using multiple linear regression for Azerbaijan Jovanovic (2016) analyses the impact of income and its changes on structure of consumption by certain group of products from 2005 - 2013 in different areas of Montenegro. Ekong (2020) evaluated economic determinants of household final consumption expenditure in West African sub - region, considering Nigeria and Ghana for the period 1999 - 2018. The study used Fixed effects least square dummy variable Panel regression analysis. It was observed in the analysis that National income and inflation exerted a significant and positive effect on household consumption expenditure, whereas interest rate and savings show up a negative and significant effect on the household consumption expenditure. Researches also consider that inflation and interest rate play a key role in determining and affecting the expenditure done by the households, Charles O. Manasseh (2018) examines the effects of interest and inflation rates (proxy - consumer price index) on consumer spending for the period 1981 - 2011 and Obinna (2020) empirically examined effect of Inflation on household final consumption expenditure in Nigeria using Ordinary least square method for the data from 1981 to 2018. Household final consumption expenditure is the dependent variable in his study whereas he has considered Inflation and interest rate as well as GDP growth rate as the independent variables. The results mentioned that inflation and GDP growth rate shows up positive and significant relation with household final consumption expenditure and interest rate

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has negative, statistically insignificant relationship with household final consumption expenditure in Nigeria. Adegboye (2013) determines and analyses the economic factors affecting private spending using time - series data ranging from 1981 to 2010, the model's framework evaluates the relative contributions of income and other factors that influence savings to the dynamics of private consumer spending in Nigeria. While real GDP growth, foreign direct investment, public spending, and changes in the real effective exchange rate had a negative impact on private consumption spending, the ratio of elderly dependency, inflation rate, gross domestic product (GDP) per capita, and disposable income had a significant positive impact. Just the interest rate showed up insignificant relation with private consumer spending.

Some studies also consider the consumption pattern changes within India, Deshmukh (2018) discussed the pattern of food and non - food consumption expenditures in India in pre and post reform periods. The study analyses the commodity wise trends in Monthly per capita consumption expenditure pattern in Rural and urban areas of Maharashtra and India. It uses CAGR and Correlation coefficient to understand the trends in the targeted periods. The results show that both rural and urban areas of India have seen an increase in monthly per capita consumption spending over time. When compared to rural areas, urban areas have seen a bigger increase in spending. Also, the proportion of spending on food products in overall spending has been on the decline; nevertheless, monthly per capita spending on non - food items has climbed.

Since the literature has not given much attention to the effect of economic variables on household consumption specifically in India so, this research seeks to understand commodity wise expenditure pattern of consumption using 11 categories on which consumer has been spending over 40 years and analyse how Private final consumption expenditures by households in India are affected by Macroeconomic variables.

The paper analyses the commodity wise trends in Private final consumption expenditure by households in India. Tries to understand the trend of Private final consumption expenditure by households, Real Disposable income, Real Savings, Deposit Interest rate, Inflation, and Population from 1980 to 2020. Studies the linear relationship between macroeconomic variables including Real Disposable income, Real Savings, Deposit Interest rate, Inflation, and Population with Private final consumption expenditure for last 40 years from 1980 - 2020.

The remainder of the manuscript is organized as follows: Section 2 dwells on the methodology, database, and variables. Section 3 presents the empirical results and delineates the structure of household consumption in India. The section 4 concludes.

2. Data and Method

This paper is based on the secondary data collected from various sources, such as National Accounts Statistics, Central Statistical Organization (CSO), Government of

India, RBI Publications, various websites, published and unpublished reports and journals etc. Using the GDP deflator, which is expressed in 2011 prices, the data on current prices spans the years 1980 - 2020, is converted to the base year.

The Statistical tools used in for the analysis are, Percentages and Averages, Compound Annual Growth Rate (CAGR) and the Least Square model and the multiple regression analysis are used to estimate the consumption expenditures function for India. The baseline consumption model for the India takes the following form:

$$Y = \beta_0 + \beta_1 X_1 t + \beta_2 X_2 t + \beta_3 X_3 t + \beta_4 X_4 t + \beta_5 X_5 t + \epsilon t$$

where, Y is the dependent variable; β_0 is the y intercept, β_1 , β_2 , β_3 , β_4 and β_5 are the coefficients that represent the slope of the line or the rate of change; X_1 , X_2 , X_3 , X_4 , and X_5 are the independent variables at the time point t; and ϵ is the error term. Y, in model is **Private final consumption expenditure** which is the final consumption expenditure of households relates to outlays on new durable as well as non-durable goods (except land) and on services. The independent variables include **Real Disposable income** which is the amount of money that an individual or household must spend or save after taxes have been deducted. **Real savings**, Households' Savings correspond to the total income saved by households during a certain period of time. **Inflation** (using CPI as proxy), Consumer Price Indices measures change over time in general level of prices of goods and services that households acquire for the purpose of consumption. **Deposit interest rate** (1 - 3 years), earned by an account holder for the amount maintained in their savings account for tenure of 1 to 3 years is called deposit interest rate and **Population** here refers to the number of people in India annually.

We have transformed some of the variables in log form to bring them up on the same scale and to make the data normal. We have not changed the values of inflation (CPI) and Deposit interest rate because it is already in percent which defines to be on the scale.

It is attempted to ascertain whether there is a linear relationship between household consumption expenditures and factors that are believed to influence these expenses with multiple regression analysis. The study's examination spans the years 1980 through 2020. The dependent variable is Private Final Consumption Expenditure (PFCE), while the independent variables are household disposable income, Savings, Population, Interest rate, Inflation (CPI as proxy).

The analysis was carried out using Excel, R programming, Tableau for data visualization and the results were interpreted on this basis. The following section presents empirical results.

3. Results and Analysis

As we are analysing the private final consumption expenditure done by household in this paper, let us have a discussion for descriptive analysis. Structure of household consumption expenditure in this study mentions about the

expenditure done by household on different commodities annually from 1980 to 2020.

3.1 Trends in commodity wise Private final consumption expenditure in India over time

Table 1 shows up average % share of total private final consumption expenditure done by household on different categories of commodities over the given time period.

Table 1: Structure of household consumption expenditure (%)

Item	1980 - 1990	1990 - 2000	2000 - 2010	2010 - 2020
Food, Beverages, and Tobacco	49.18	47.52	37.25	32.79
Hotels & Restaurants	0.89	1.20	1.83	1.99
Clothing & Footwear	7.09	6.96	6.07	6.43
Gross Rent, Fuel & Power	22.66	17.20	16.91	15.11
Furniture, Furnishing, Appliances & Services	2.79	2.61	2.79	3.03
Medical Care & Health Services	2.56	2.78	4.54	4.28
Transport	7.61	12.65	15.56	15.11
Communication	0.90	1.57	2.70	2.33
Recreation	0.79	0.87	0.97	0.90
Education	1.75	2.25	3.18	4.08
Misc. Good & Services	3.65	4.39	8.22	13.95
Total PFCE	100.00	100.00	100.00	100.00

Source: NAS (% Calculation done by author)

Food, beverages, and tobacco captures the highest share of the total expenditure showing a decreasing trend overall as it is showing an average of around 49% in the first 1980 - 90 but reduces to around 33% in 2010 - 20. The share of hotels and restaurants, Communication and Recreation in the total expenditure tends to be quite less, also can be seen as the

lowest values over all commodities, but shows up an increasing trend for Hotels and Communication but is somewhat around 1% only for Recreation. Clothing and footwear comprise of around 7% of the total share in the early stages which deliberately shows a decreasing trend in the recent years but again just by 1%.

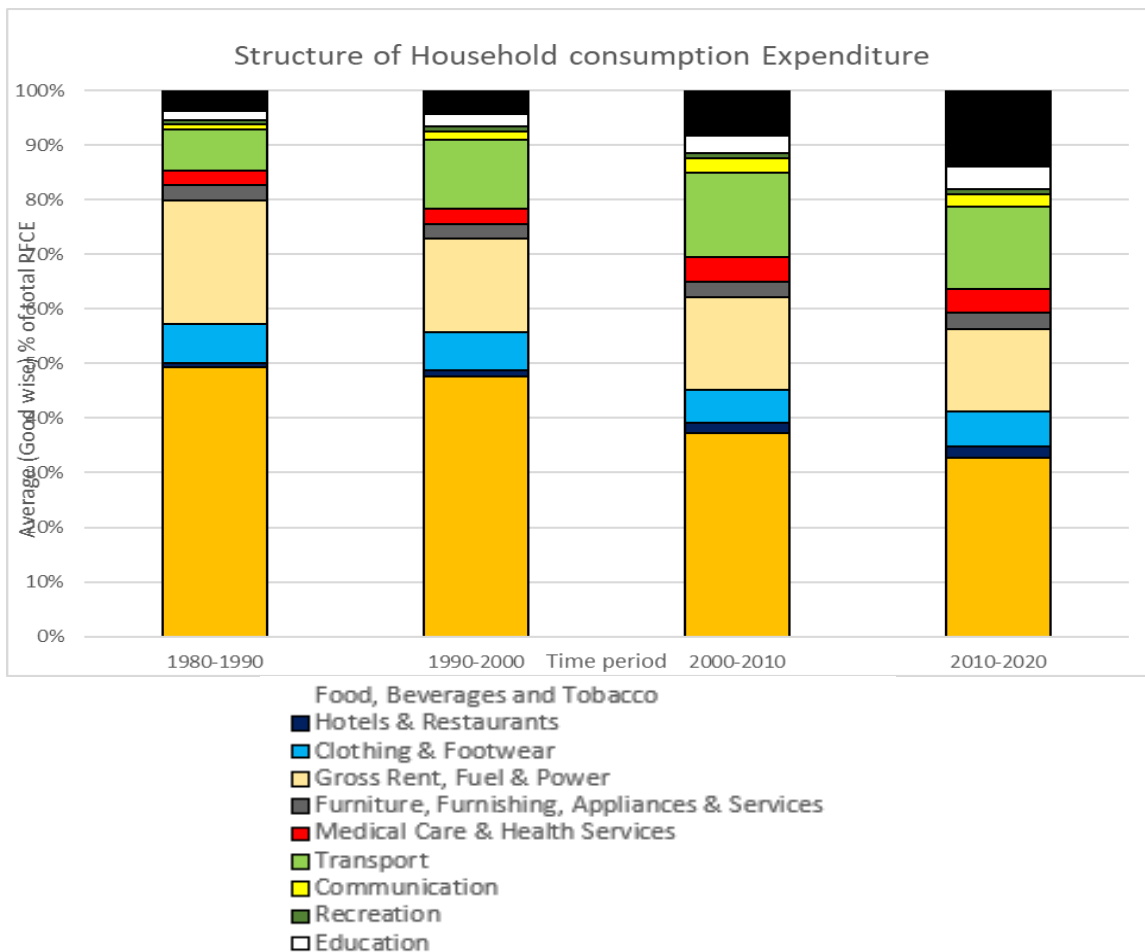


Figure 1: Structure of household consumption expenditure (%)

Source: Created by author

Medical care and health services comprises of around 3% of the total share in expenditure which also increases a little with time. Transportation expenditure shows up 8% share in total expenditure which has increased almost double in the overall time period to around 15%. Education takes up 2% of the total share of expenditure in the early years but again shows up an increasing trend overall as it shows up 4% in

2010 - 20. Lastly miscellaneous goods and services also depicts increasing trend, that too thrice of as it was in the earlier stage from 4% to around 14%.

3.2 Average and Compound annual growth rate of PFCE and factors affecting PFCE

Table 2: Average

Time	Unit	1980 - 1990	1990 - 2000	2000 - 2010	2010 - 2020	Total
PFCE	Rs in Billion	15579.52	22653.54	35632.86	61486.16	34069.26
Population	Million	756.45	926.36	1104.45	1274.91	1015.61
Real savings	Rs in Billion	2752.36	6118.36	14222.20	22956.50	11546.48
Disposable Income	Rs in Billion	16197.98	27703.37	49023.44	2457477.50	681262.56
(Inflation) CPI	%	9.19	9.04	6.12	6.78	7.74
Deposit rate (1 to 3 years)	%	8.86	10.52	7.00	7.36	8.43

Source: RBI Annual report publications (Calculated by author)

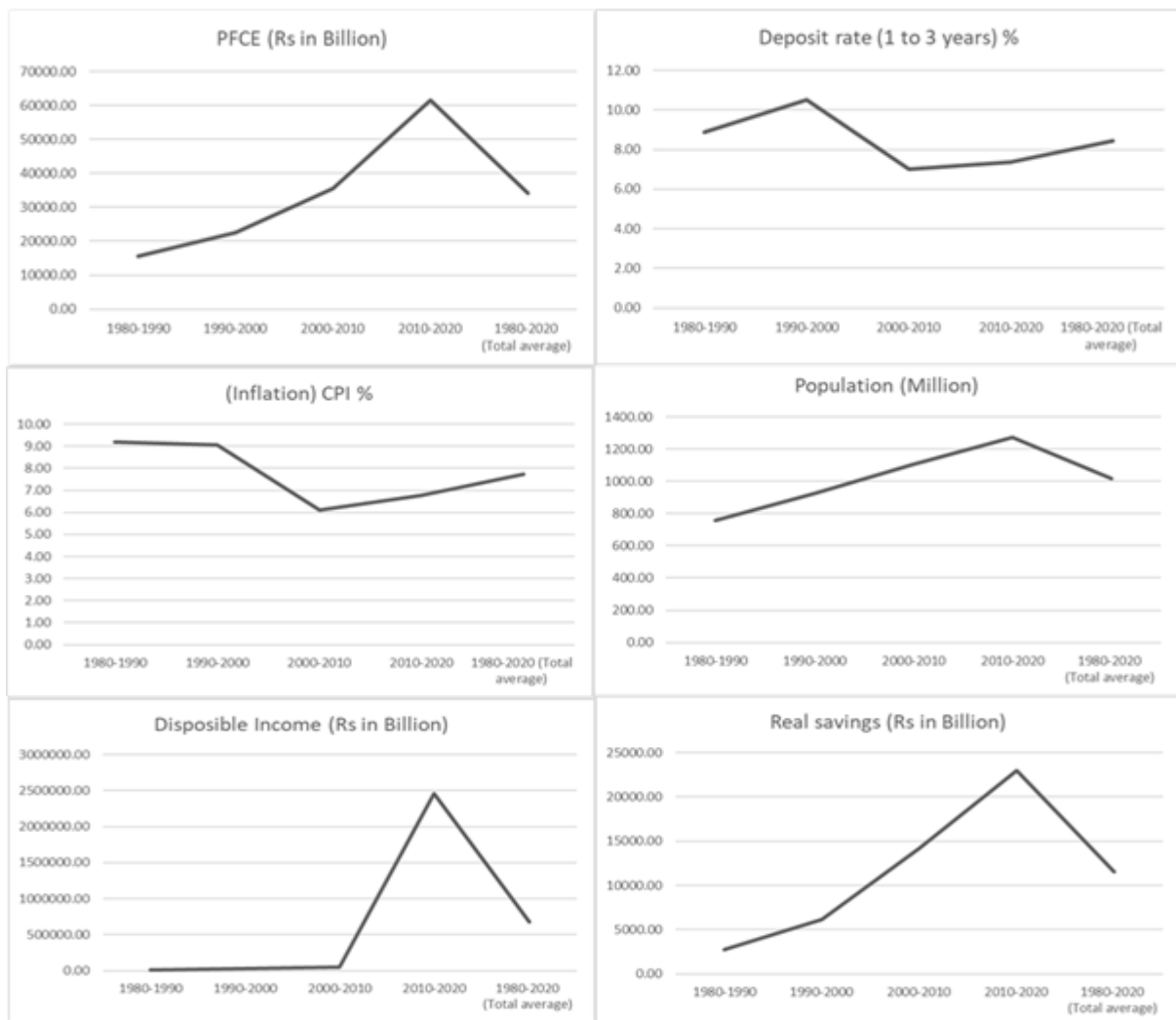


Figure 2

Source: Created by author

Table 3: Compound annual growth rate (%)

Time	1980 - 1990	1990 - 2000	2000 - 2010	2010 - 2020
PFCE	3.69	4.30	5.84	5.08
Population	2.38	2.18	1.70	1.49
Real savings	11.33	7.87	8.18	5.22
Disposable Income	5.70	6.54	6.39	7.26
(Inflation) CPI	- 2.58	- 8.56	12.94	- 6.38
Deposit rate (1 to 3 years)	1.93	- 0.60	- 2.75	- 3.30

Source: RBI annual report publication (Calculated by author)

Table 2 evaluates Private final consumption expenditure and the factors affecting it by taking average and table 3 illustrates compound annual growth rate for the given economic variables for periods as 1980 - 1990, 1990 - 2000, 2000 - 2010, 2010 - 2020.

PFCE shows an increasing trend overall, whereas it is increasing at an increasing rate as we can see in CAGR but increases quite lesser in the last period from 2010 - 20 as compared to 2000 - 10. PFCE have increased four times in the last 40 years. Whereas the average value of the period 2010 - 20 that is 61486.16 billion is almost double to the overall average of the given time that is 34069.26 billion.

Population also increased from 756.45 million to 1274.91 million overall, shows an increasing trend but at a decreasing rate from 2.38% in the first 10 years to 1.49% in the latest 10 years.

Real savings shows an increasing trend from 1980 to 2020, the values depicts that there is almost 8 times increase in the real savings in the latest years as compared to the previous years. The rate of increase is the highest in 1980 - 1990 and lowest in 2010 to 2020, possible reason for the lowest values might be the pandemic which the country faced in the latest years.

Disposable income also shows major increase as the time passes from average of 16197.98 billion to 2457477.50 billion in 2010 - 20. Disposable income has shown a huge increase. The average of 2010 - 20 is more than average of the total 40 years. The disposable income is increasing at an increasing rate as well. 7.26 in 2010 - 20 takes up the highest value as shown in table 3.

Inflation shows up a major dip over 40 years. The average inflation was 9.19% in the first 10 years but gradually shows a decrease in number to 6.78% in 2010 - 20 which is slightly higher than 2000 - 10 but still lower than the overall average over the time.

Deposit interest rate have increased from 1980 - 90 to 1990 - 00 but still have shown a major reduction from 1990 - 00 to 2020. It was the maximum in the period 1990 - 00 which is even greater than the overall total average and shows the value 7.36% in 2010 - 20 period which is lower than the total average.

3.3 The Least Square model and the multiple regression analysis

Depending on the results from R software package, the linear association between dependent and independent variables is given in Table 4.

Table 4: Correlation Coefficients of Variables

	PFCE	Population	Real savings	Real disposable income	CPI	Deposit interest rate
PFCE	1					
Population	0.981633	1				
Real savings	0.972047	0.995065	1			
Real disposable income	0.776315	0.71525	0.697814	1		
CPI	- 0.44322	- 0.47125	- 0.46625	- 0.43227	1	
Deposit interest rate	- 0.50942	- 0.47864	- 0.50207	- 0.44743	0.569031	1

It can be interpreted that the independent variables have a linear relationship with the dependent variable. The impact of the inflation and deposit rate can be considered as a weak linear relationship. We can also justify the strong relationship between savings and population as population of a country increases the savings also increases by growth effect.

As observed in Table - 5, Summary output of regression analysis, the model is well fitted. According to the results, the regression equation explains the relationship between economic indicators at 97.85% (Adjusted R - squared = 0.9785) and all the independent variables clearly shows significant linear relationship with the private final consumption expenditure as the p - value is less than 0.05 for all the independent variables.

Table 5: Summary output of regression analysis

Residuals:				
Min	1Q	Median	3Q	Max
- 0.07379	- 0.01776	- 0.00022	- 0.00022	0.07129

	Estimate	Std. Error	t value
Intercept	- 5.548991 ***	1.406144	- 3.946
Population	3.715151 ***	0.682501	5.443
Real savings	- 0.334297 *	0.157919	- 2.117
Real disposable income	0.050313 ***	0.013195	3.813
CPI	0.006338 **	0.002314	2.739
Deposit interest rate	- 0.011207 **	0.004088	- 2.741

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Beta coefficient which shows the impact level of independent variables on the model shows that there is a positive linear relationship between Populations, Disposable income, inflation (CPI) with Private final consumption expenditure. Whereas, Real savings and Deposit interest rate shows up negative or inverse linear relationship with Private final consumption expenditure.

According to formula, the estimated formula for Private final consumption expenditures is as follows;

$$\ln PFCE = - 5.548991 + 3.715151 * (\text{Population}) - 0.334297 * (\text{Real savings}) + 0.050313 * (\text{Real disposable income}) + 0.006338 * (\text{CPI}) - 0.011207 * (\text{Deposit interest rate})$$

Residual standard error: 0.03487 on 35 degrees of freedom
Multiple R - squared: 0.9812 Adjusted R - squared: 0.9785
F - statistic: 364.6 on 5 and 35 DF, p - value: 0.0000

According to the results, it is seen that independent variables have a significant impact on the regression equation for household consumption expenditures.

4. Discussion and Conclusion

The largest portion of total spending, which includes food, beverages, and cigarettes, is on a downward trend overall, with an average of 49% in the 1980s and 1990s and 33% in the 2010s and 2020s. The proportions of hotels and restaurants, communication, and recreation in total spending tend to be quite low and are also among the lowest values among all commodities.

PFCE has increased four times in the last 40 years, with an average value of 61486.16 billion. Population has increased from 756.45 million to 1274.91 million. Real savings have increased 8 times, with disposable income increasing at an increasing rate. Inflation has decreased from 9.19% in the first 10 years to 6.78% in 2010 - 20. Deposit interest rate has increased from 1980 - 90 to 1990 - 00, but has shown a major reduction from 1990 - 00 to 2020.

According to the results of linear regression analysis, all the given independent variables including Population, Real savings, Real Disposable income, Inflation (CPI) and Deposit interest rate have a linear relationship with Private final consumption expenditure by households. All the other variables except Real savings and Deposit interest rate are positive linearly related to Private final Consumption Expenditure that is justified as, if the savings of a household are more, then they would have lesser money to spend for consumption and similarly if the deposit interest rate is higher, people would tend to keep more money as savings and then again have lesser to spend on other consumption.

Moreover, analysing these variables separately 1 percent increase in population increases Private final consumption expenditure by 3.71 percent. 1 percent increase in Real savings reduces the Private final consumption expenditure of household by 0.33 percent as it shows negative or inverse relationship with the dependent variable. Disposable income and inflation depict positive linear relationship as concluded by Obinna (2020) that states, 1 percent increase in these variables increases the Private final consumption expenditure by 0.050 percent and 0.006 percent respectively. And deposit interest rate for 1 to 3 years shows inverse relation so 1 percent increase in Deposit interest rate reduces the Private final consumption expenditure by 0.01 percent. The result is in alignment to the results of Ekong (2020).

There is scope for different results as the model has some limitations as there is presence of autocorrelation in the data, if time series analysis is used for the given data it might give out different results.

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