A DISTRICT LEVEL ESTIMATION OF CONSUMPTION FUNCTION IN ASSAM

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Abstract

In this research endeavor, we conducted a meticulous examination of the determinants of household consumption expenditure through the utilization of the Ordinary Least Squares (OLS) technique applied to a log-linear model. Our investigation concentrated on eight districts in Assam, namely Dhubri, Goalpara, Kamrup, Morigoan, Tinsukia, Jorhat, Karbi Anglong, and Cachar, utilizing the comprehensive India Human Development Survey 2012 (IHDS) dataset. The empirical outcomes underscore that various factors, including household income, assets, education, family size, and household loans, exert a significant and positive influence on the overall household consumption expenditure. Intriguingly, age exhibits a negative impact on household consumption expenditure. Additionally, a set of dummy predictors, encompassing variables such as religion and seasonal migration, were incorporated into the analysis. A pivotal finding emerging from our study revolves around the conspicuous correlation between the proclivity towards household consumption expenditure and the acquisition of household loans. This revelation underscores the interconnectedness of borrowing behaviors and consumption patterns within households.

INTRODUCTION

The consumption function, a crucial idea in macroeconomic theory, clarifies the connection between consumer spending and disposable income, providing essential insights into economic behavior at both individual and aggregate levels. In India household consumption expenditure as a percentage of GDP during 1960 to 2022 was on an average 69.24 percent with a minimum of

54.72 percent in 2010 and a maximum of 87.38 percent in 1960. The latest value from 2022 is

60.55 percent. For comparison, the world average in 2022 based on 124 countries is 62.86 percent (India: Household consumption, percent of GDP).Consumption involves the use of goods and services by individuals, households, or societies to fulfill their needs and desires. Beyond being considered a personal choice, consumption is examined as a crucial factor influencing aggregate demand, thereby impacting economic output, employment, and various macroeconomic indicators. Scholars investigate diverse elements influencing consumption patterns, such as income, wealth, preferences, and economic policies. Moreover, interdisciplinary research integrates sociological, psychological, and cultural perspectives to offer a comprehensive understanding of consumption behavior (Becker, 1965) John Maynard Keynes's influential work, "The General Theory of Employment, Interest, and Money" (1936), is the cornerstone that introduced and formalized the consumption function. This revolutionary treatise established the basis for contemporary macroeconomics by proposing that consumer spending is influenced not only by current income but also by a fundamental level of autonomous consumption. Extensive theoretical and empirical discourse in both microeconomics and macroeconomics exists, addressing significant factors that ascertain the level, growth, and distribution of consumption, whether examined at a specific point in time or over an extended period (Kasturi A. , Bhattarai, Prasuna, & Siva Kumar, 2023).According to J.M. Keynes consumption depends on absolute income of current period with Marginal propensity to Consume(MPC) i.e changed consumption expenditure out of change in Income ranging from zero to one. Unlike classical economist Keynes was skeptical about the role of interest rate as a determining factor of consumption expenditure. He outlined three key points in support of his argument. Firstly, he asserted that consumption expenditure primarily hinges on the absolute income of the present period. Secondly, he emphasized that consumption is positively correlated with the absolute level of current income. Lastly, Keynes contended that an increase in income leads to a corresponding rise in consumption expenditure during that specific period (Jhingan, 2002). Economists such as (Friedman,1957), (Modigliani,1963), (Keynes,1936), (Duesenberry, 1949) among others, have explored the factors influencing consumption expenditure. They have examined both quantitative and qualitative elements, including income, wealth, interest rates, capital gains, liquid assets etc. Moreover microeconomic determinants such as household demography those are age, family size, and life stage, religion, caste; household debt level, . Consumer confidence, expectation, taste and preference play a significant role in determining consumption choices. Empirically many writer around the globe investigated the factor determining consumption function for example (Ajayi,1974) addressed Tomori's findings by centering their discourse on the identification of the most appropriate indicators. They concluded that critical factors influencing consumption expenditure in Nigeria included interest rate, monetary aggregate, and family size. This paper distinguishes itself by focusing on the estimation of microeconomic factors influencing household consumption expenditure in a specific Indian state. Additionally, we endeavor to assess the impact of various socio-economic factors on consumption expenditure behavior.

Literature review

Household consumption expenditure serves as a pivotal gauge of economic welfare and significantly influences the trajectory of overall economic growth. A thorough comprehension of the factors governing household consumption expenditure holds paramount importance for policymakers, economists, and researchers. This literature review endeavors to offer a comprehensive survey of the elements that shape household consumption expenditure, synthesizing insights from various scholarly articles and research studies. Several investigations underscore a robust association between income and household consumption expenditure, as evidenced by studies such as those conducted by (Hall,1978) and (Deaton,1992). Traditional economic theories, such as the Keynesian consumption function, propose that an increase in household income corresponds to a rise in consumption. Moreover, the substantial impact of wealth accumulation on consumption decisions has been identified by scholars like (Carrol,1997). Studies, exemplified by the work of Campbell and (Campbell & Mankiw,1989) underscore the influence of interest rates on consumer behavior. Variations in interest rates have the potential to modify borrowing costs, thereby impacting household consumption. Furthermore, investigations by (Dynan,2000) and additional researchers delve into the significance of credit accessibility and household indebtedness in molding consumption patterns. Demographic factors, such as the makeup of households and educational attainment, are consistently recognized as factors influencing consumption by (Browning, M., & Collado, 2001). The existence of children, for example, has been linked to specific consumption behaviors, leading researchers to explore the subtle impact of demographic characteristics on decisions related to expenditure. Many researcher investigated psychological elements, especially consumer confidence and expectations. Attitudes toward the economy and future outlooks can profoundly influence the behavior of household consumption. Studies provide insights into the intricate relationship between psychological factors and decisions related to spending. (Kasturi A. , Bhattarai, Prasuna, & Kumar, 2023) estimated consumption functions of rich and poor households located in rural and urban areas in India and its twenty-eight states. The primary outcomes of the research indicate that, according to macro time series data spanning from 1990 to 2020, the marginal propensity to consume in India is 49.8 percent. On a micro level, using household data, there remains a positive and substantial correlation between income and consumption. However, the marginal propensity to consume at the micro level is notably lower than that observed at the macro level. Furthermore, the study reveals that urban areas exhibit higher consumption levels compared to rural areas, and significant variations in consumption patterns exist across different states.

(Samantaraya & Patra, 2014).The study empirically investigated the factors influencing household savings in India. The researchers utilized the ARDL approach, chosen for its appropriateness in estimating equations containing a combination of stationary and nonstationary variables of order I(1), and to address potential endogeneity issues. The findings from the analysis indicate that GDP, dependency ratio, interest rate, and inflation exert statistically significant effects on household savings in both the long run and short run. (Khan, Anwar, Ahmed, & Kama, 2015) utilized annual data spanning from 1971 to 2013 and employs both the Keynesian Consumption Function (KCF) and the Permanent Income Hypothesis (PIH) to ascertain and estimate consumption functions for the SAARC countries. The researchers observed that, in the short term, there is a substantial disparity between the Keynesian Consumption Function (KCF) and the Permanent Income Hypothesis (PIH) concerning Marginal Propensity to Consume (MPCs). This variance implies that, in the short term, consumers primarily base their consumption decisions on their current income. Additionally, the study extends its analysis to estimate MPCs under the PIH in the long term. The findings reveal that, in the long run, the MPC values are higher compared to those derived from using PIH, indicating that consumers, in the long term, anticipate their future income and make consumption decisions based on their permanent income. (Chioma,2009) conducted a research study examining the relationship between gross domestic product and personal consumption expenditure in Nigeria from 1994 to 2007. Through the use of regression analysis, the results indicated that an increase in gross domestic product did not result in a statistically significant influence on personal consumption expenditure in Nigeria. Additionally, the study found that gross domestic product explained roughly 3.5% of the variability in Nigeria's personal consumption expenditure. (Mishra,2011) examined the correlation between actual consumption expenditure and economic growth in India using cointegration tests and vector error correction regression for the period 1950-51 to 2008-09. The findings reveal a long-term equilibrium relationship among the variables. The causality test within the error correction model suggests a unidirectional causal link from real private consumption expenditure to economic growth in the long run. However, the short-term application of the Granger causality test indicates the absence of causation between these variables. (Basumatary , 2015)This study examines the consumption expenditure patterns related to food, education, health, fuel and lighting, intoxicants, and cell phone expenses among the Bodo tribe residing in the Jalah Development Block. The research reveals that the consumption expenditure in this tribal region is primarily influenced by the income derived from labor in the agricultural sector. Moreover, it was observed that in numerous households, expenditures exceeded their income, however author did not provide a causal explanation among the variables.(Varman & Kumar, 2020)studied impact of the Mahatma Gandhi National Rural Employment Guarantee Act program on the magnitude and structure of consumption expenditure among rural households at the national level, employing a difference-in-differences methodology. The results suggest a rise in the monthly per capita consumption expenditure among participating households, along with a shift in their consumption patterns .Upon reviewing the existing literature, it becomes apparent that prior studies have predominantly concentrated on identifying the macroeconomic factors influencing household consumption expenditure. However, there is a noticeable dearth in the exploration of microeconomic determinants affecting household expenditure. Additionally, a

majority of the research has been centered around national-level data, with a limited scope on regional analyses. Recognizing these gaps, the present study endeavors to contribute by specifically addressing the microeconomic determinants of household expenditure at both national and regional levels, thereby enhancing the comprehensiveness of existing research in this domain.

Data and methodology
 The econometric method to estimate the determinants of consumption expenditure is widely known among researchers, we have specified our empirical model as follows
$lnC = \alpha + \beta_1 Income + \beta_2 Assets + \beta_3 Edu + \beta_4 HSize + \beta_5 Age + \beta_6 Benefit + \beta_7 Debt +$
$\beta_8 Lloan + D_1 Religion + D_2 Dev + D_3 Stock + D_4 BPL + D_5 Smig + u_i$……………….(1)
Where,
lnC= Natural logarithms of total household consumption expenditure,
Income = Total household income from all sources
Assets=Household assets measured as unit of land holdings
Edu=Highest adults education
Hsize=Household size i.e number of household members
Age= Average age of the household members
Benefits=Benefits received from government in rupees
Debt=Outstanding household debt
Lloan= Largest amount of loan in rupees
Religion=Religion of the household
Dev= Level of development of the place of residence of the household
Stock=Livestock won by household
BPL= Household belonging to BPL category
Smig= Seasonal migration
u_i = Random errors
And β_1 to β_8 are the respective parameters, whereas D_1 is the dummy for religion which takes 0 for Hindus,1 for Muslims, 2 for Christian and 3 for Trible. Similarly Dummy variable D_2 takes 0 for other urban,1 for more development Village and 2 for less development village. D_3 takes 0 if household does not posses livestock like cows, goats etc. and 1 if the corresponding household possesses livestock. Likewise D_4 takes 0 if household does not belong to BPL category while

takes 1 if belong to BPL category, and dummy variable D_5 takes 0 if household does not emigrate for work during some season while takes 1 if the household emigrate for work

The rational for including most of the above variable is inspired by the literature for example household income as a positive determinant of household consumption expenditure is taken from Keynesian absolute income hypothesis however the hypothesis talks about aggregate income and consumption but we narrowed down those to micro level to household income and household consumption expenditure. According to Keynesian psychological low of consumption β_1 is expected to lie between zero to one. Likewise wealth at micro level is proxied by household assets which is expected to have a positive impact on household consumption expenditure. Education level, age, household size ,household debt level, religion as social group are well studied determinant of total household consumption expenditure. Many of the household in the region of Dhubri, Goalpara district work in the bricks making firm in other states therefore Seasonal migration is included to capture the effect of the same. We have also included weather household own livestock because livestock is also considered as saved wealth which might have impact on household consumption expenditure.

We used The India Human Development Survey 2012 (IHDS) dataset which is a nationally representative, multi-topic panel survey of 42,152 households in 384 districts, 1420 villages and 1042 urban neighborhoods across India. For our study we focused 8 districts in Assam namely Dhubri, Goalpara, Kamrup, Morigoan, Tinsukia , Jorhat ,Karbi Anglong and Cachar.

Empirical results and Discussion

Descriptive statistics of the sample are tabulated in the table 1 and 2. It is observed that the total yearly household consumption expenditure has a mean of 110151.4 rupees with standard deviation of 84021.46 rupees, Assets is the household land holding in Bighas which has a mean of 13.83768 bighas with a standard deviation of 5.960891 bighas. While education is taken the maximum year of schooling of adults in the household, the mean year of schooling is reported to be 9.003908 years with a standard deviation of 4.800243 years. The average age of the household guardian members are taken as a proxy for the age which is able to capture the brief idea of ages of all the members in the household, which has a mean of 45.61493 years with standard deviation of 11.60697 and so on. In our sample nearly 64.30% households belong to BPL category and has a ration card and 35.70% households don't have and belong the same. Nearly 94.89 household at least have one seasonal migrant worker. 58.77% households belong to Hindu religious group, 38.91 are Muslim and 2.32% belongs to Christians and Tribal category.

Table-1

Variables	observations	mean	sd	Minimum	Maximum
Total consumption expenditure	4,603	110151.4	84021.46	9000	1039008
Income	4,606	139938.9	154954.7	0	1740000
Assets	4,602	13.83768	5.960891	1	30
Edu	4,606	9.003908	4.800243	0	16
Hsize	4,606	5.422058	2.078666	1	12
Age	4,033	45.61493	11.60697	17.5	85
Benefit	1225.221	6201.654	6201.654	0	86400
Debt	3,404	13853.89	61158.68	0	956000
Lloan	4,575	22149.9	82457.65	0	1100000

Table-2

		Frequency	Percentage
BPL	Yes	2,959	64.30
	No	1,643	35.70
Smig	Yes	4,304	94.89
	No	232	5.11
Religion	Hindu	2,707	58.77
	Muslim	1,792	38.91
	Others	107	2.32
Dev	Urban	1,253	27.20
	More development village	470	10.20
	Less development village	2,883	62.59
Stock	Yes	2,391	51.91
	No	2,215	48.09

Equation (1) is estimates employing Ordinary Least Square (OLS) technique, the resultant coefficient are reported in table (3) Almost all the variable have statistically significant impact on household consumption expenditure except Benefits received from government in rupees by the households, Outstanding household debt and dummy variable others religious group which includes Christians and Tribal. The model has a constant of 10.45913 which means that If all the explanatory variable are zero the household consumption expenditure is e^10.45913 which is 34861.290 rupees approximately in a year. The coefficient of household income is 4.95e-07 means that if household income increases by one unit the household consumption expenditure increase by 0.00000495 percent percent keeping all other explanatory variable constant which is statistically significant, similarly if household assets increases by one unit i.e household land holding increases by one bigha ,consumption expenditure increases by 5.17881 percent keeping all other explanatory variable constant. Likewise an additional member in a given household increases the household consumption expenditure by 6.74406 percent. One year increases in the age of household guardians average age is associated with a 0.1582 percent fall in the total household consumption expenditure moreover if highest amount of loan increases by one rupee the household total consumption increases by 0.0000104 percent, the reason behind this positive coefficient is due to the observational fact that in the area like Dhubri, Goalpara, household takes loan from Bandhan bank and expense on durables. Compared to Hindus, the Muslim household total consumption expenditure is 5.63 percentage rupees lesser in a year on an average. Likewise compared to urban areas the total household consumption expenditure of the household residing in more developed villages is 17.26 percent lesser, while 11.57percent lesser on an average residing in less developed areas. Household who own live stocks spend 10.9 percent lesser compared to household having live stocks due to the observational fact that poor family are more likely to own live stocks. Similarly households having a ration card along with BPL status spends 8.30 percent lesser as compared to non-BPL households and seasonal migrant worker having households are expected to spend 19.11 percent higher as compared to the household not having seasonal migrant workers keeping all other explanatory variable constant.

Table-3

Source	SS	df	MS		
				Number of obs =	2,436
				F(16, 2419) =	304.05
Model	628.691945	16	39.2932465	Prob > F =	0.0000
Residual	312.617108	2,419	.129234026	R-squared =	0.6679
				Adj R-squared =	0.6657
Total	941.309053	2,435	.38657456	Root MSE =	.35949

Variables		Coefficients	se	t stats	P>|t|	95% conf. interval
Constant		10.45913	.0460154	227.30	0.000	10.3689 - 10.54936
Income		4.95e-07	5.42e-08	9.13	0.000	3.89e-07 - 6.01e-07
Assets		.0517881	.0022206	23.32	0.000	.0474335 - .0561426
Edu		.0046268	.0021705	2.13	0.033	.0003706 - .0088831
Hsize		.0674406	.0039689	16.99	0.000	.0596578 - .0752235
Age		-.0015821	.0006867	-2.30	0.021	-.0029287 - -.0002354
Benifit		2.09e-08	1.08e-06	0.02	0.985	-2.10e-06 - 2.14e-06
Debt		3.96e-07	3.12e-07	1.27	0.205	2.16e-07 - 1.01e-06
LLoan		1.04e-06	1.81e-07	5.73	0.000	.82e-07 - 1.39e-06
Religion Dev	Muslims	-.0563749	.0188926	-2.98	0.003	-.0934222 - -.0193275
	Others	-.0553474	.1387934	-0.40	0.690	-.3275137 - .2168189
	More developed	-.1726516	.028596	-6.04	0.000	-.2287268 - -.1165765
	Less developed	-.1157758	.023212	-4.99	0.000	-.1612933 - -.0702582
Stock	Yes	-.1090785	.0169859	-6.42	0.000	-.142387 - -.07577
BPL	Yes	-.0830679	.0162152	-5.12	0.000	-.114865 - -.0512709
Smig	Yes	.1911443	.0326427	5.86	0.000	.1271337 .2551548

⁜All calculation are done using STATA-17

We conducted Ramsey RESET test for omitted variables the reported F- statistic is with 1.91 with 3 and 2416 degrees of freedom with a P-value of 0.1251 indicating that the model does not have omitted variable. Mean VIF is found to be 1.94

which indicates absence of multicollinearity. The reported test statistic of Breusch–Pagan test for heteroscedasticity is 0.06 with a P-value of 0.8004 which implies that the model is free from the problem of heteroscedasticity. We conducted Skewness and kurtosis tests for normality of residuals the resultant joint test statistics is 151.80 with a p-value of 0.087543 indicating the normal distribution of the residuals

Conclusion

In this study we used The India Human Development Survey 2012 (IHDS) dataset to estimate the factor determining household consumption expenditure by employing OLS technique. We focused 8 district in the Assam namely Dhubri, Goalpara, Kamrup, Morigoan, Tinsukia , Jorhat ,Karbi Anglong and Cachar. The empirical estimated result reveals that household income, household assets, education, family size, household loan all have significant positive impact on the total household consumption expenditure, One noteworthy revelation from our study lies in the remarkable correlation between the inclination towards household consumption expenditure and household loans. This positive and statistically significant relationship carries substantial policy implications, particularly for institutions like Bandhan banks and households engaged in loan transactions. It is pivotal to recognize that, rather than channeling the borrowed funds into productive ventures, a considerable portion is directed towards consumption. This trend raises concerns for developmental prospects. Consequently, there is a pressing need to raise awareness among households acquiring loans, urging them to adopt more prudent financial practices. Simultaneously, lenders, including institutions like Bandhan banks, should consider fortifying their lending policies to mitigate the risk associated with excessive consumption-oriented use of loans.

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