

Consumption Puzzle theory in Economics

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Abstract — This research paper examines the concept of consumption Puzzle in the long-term context. An eye catching and an important problem in macroeconomics theory which economists have tried to solve for decades. The mirage of a given predicted relationship between income and consumption is yet to be supported by theories over the long term. The absolute theory of consumption is an important traditional theory. The theory says changing income will lead to change in consumption but only at a diminishing rate. This concept leads to formation of another important concept that is average propensity to consume (APC) will gradually decrease when the economy grows. According to this reasoning the long run economic growth will be achieved by raising the savings in the economy. Historical economic data shows a distinct trend when examining national income in the long term. As economics grew over many years, both income and spending increased together in almost the same. In simple words, when people earn more over the long term they also spend more and divide their income for future expenditures that make their consumption and income stable in the long run. But according to old theories if the income rises then people should save more of their income and the spending share will change. To solve the consumption puzzle many economists said people do not make spendings by only present income. In fact they think more broadly when their income is increased. The Permanent income hypothesis says that people spend their income on the basis of not only current income but also care about future income. Example: if someone's income increases for a short time or a one-time increment then they may save most of it because they know it is a temporary income change. But when the income changes permanently then they increase their consumption. The Life Cycle Hypothesis also provides a similar idea. It says people plan their spending over their whole life, they may save during the working year, make consumption and save for retirement and sustain their consumption even after retirement. However their low income doesn't affect their consumption. People not only save for retirement but also have saving habits from generation for emergence funds, education and major household works.

Keywords— Consumption Puzzle Theory, Economics, Consumption Function, Income and Consumption, Marginal Propensity to Consume (MPC), Average Propensity to Consume (APC), Permanent Income Hypothesis, Life-Cycle Hypothesis, Keynesian Consumption Theory, Consumer Behavior, Household Consumption, Savings Behavior, Disposable Income, Economic Expectations, Aggregate Demand, Macroeconomic Analysis..

I. INTRODUCTION

Consumption is the most surprising economics' observation in which the actual spending in the economy doesn't align with consumption in the economy or classical theory of consumption.

Where consumption will be affected by the change in income. Very popular economic models such as Income Hypothesis and Life Cycle Hypothesis suggest that an individual plans their present and future consumption for the long term which leads to the problem of consumption puzzle because classical theory of consumption works accurately in the short term. These theories don't include short term income such as bonus, incremental income, salary cuts should have very little impact on spending in the economy. Instead, an individual should aim or plan their consumption stable in the long term.

Example: An individual earns during the working period of the life, consumes the income, saves a part from income for uncertainty and retirement.

However the real world statistics tell us a different story. Studies show that consumption often increases rapidly even when the income changes temporarily, this phenomena known as excess sensitivity of consumption to income. And in the same period the spending in the economy remains stable despite large functions having taken place, which leads to excess smoothness in the consumption. On the other hand the income is volatile from month to month, year to year, but the consumption is much less volatile in comparison to income. This discrepancy between theory and real-world behaviour creates the Consumption puzzle. Which many economists tried to explain for decades.

Why is the consumption puzzle important?

From the major part of an economy, consumption is one of them. In almost every country, especially in large economies such as India, China, USA consumer spending plays an essential role because it makes up more than half of the Gross Domestic Product (GDP). This means the consumption made by people in the economy directly affects the overall economy such as business growth, Development and employment conditions. This is how it's become very important to study about the consumption puzzle for better planning of an economy.

Importance of Studying the Consumption Puzzle

Understanding a consumption puzzle is crucial for economists and policymakers. Because consumption is the major part of the economy and consumer spending makes up over half of GDP in most every modern day economy. Policy makers and economists can easily understand the economic condition through spending habits, saving rate and consumption.

During economic crises or recessions, governments often use tools such as tax cuts or less expenditure and less investment in the economy. Therefore analyzing the consumption puzzle can help to design policies such as monetary and fiscal.

II. LITERATURE REVIEW

The relationship between income and consumption attracts significant attention in macroeconomics. But the theoretical expectations failed in terms of long term patterns of income and consumption. The traditional theory of Keynes says that household expenditure is mostly dependent on the current income and people saved when their income increased permanently.

This theory says that as income grows then the consumption rises at a slower rate. Lending will decline consumption-income ratio over time. Such evidence suggests that economic growth should gradually increase saving rates in the economy. The Long-term statistical evidence however, presented a challenge to this conclusion. Historical national accounts examined by Simon Kuznets show that over many years the economy was growing and people were earning more money but the amount spent did not decrease as economists expected.

Instead, the proportion of income that people spend stays almost the same because individuals cannot change their consumption frequently as their income increased. This pattern contradicts the Keynes short-run theory.

So, the theoretical focus has shifted to dynamic income from static income. This theory is given by Milton Friedman that suggests the individuals distinguish short income change and long term income change. The consumption decision is influenced by not only current income but also lifetime resources. The permanent income growth will lead to the same proportion adjustment in spending that leads to stability in consumption and income in the long term.

There is another popular theory by Francis Modigliani, that says individuals allocate resources across different life stages of life to maintain stable and consistent consumption. This life cycle planning mechanism further supports the persistence of stability in consumption and income in the long term. In recent years economists have added more real world factors because they understand people go through different phases of life such as job loss, medical expenses and strict borrowing conditions. Another important factor is habit and behavior because people mostly stick to their usual lifestyle and do not change their spending frequently.

Objective of the Research Paper

The main aim of this research paper is to go deep on the concept of consumption puzzle with real world data and analysis with established Economic theories. The concept that we need to look at "why an individual spending habits behaves unexpectedly?" Many times spending turnover is sensitive to short term income changes, while at the other time spending remains significantly stable even if the income has changed because of job change, unemployment, salary hike or temporary shocks. This research paper will list some limitations of well-known classical economic theories, such as the permanent Income Hypothesis by Friedman and The Life Cycle Hypothesis by Modigliani and Brumberg. These economic theories suggest that people can smooth their consumption over time based on their expected life and income. However, the real world observations reveals that the consumption can react much more strongly to temporary changes when the income changes as compared to long term income changes. As these theories predict or remain stable when the significant income changes occurred. These contradictions highlight the gaps in the traditional understanding of consumer behaviour. To explain these problems this research paper will explore various alternative explanations that are supported by modern studies.

Classical Theories of Consumption:

Absolute Income Hypothesis by John Maynard Keynes:

The Absolute Income Hypothesis was proposed by John Maynard Keynes in 1936 ("The General Theory of Employment, Interest and Money by John Maynard Keynes",

n.d.). This states that consumption depends primarily on the current absolute level of income of an individual or household. According to this theory, when income increases, consumption also increases, but not by the same proportion. This means people tend to save a part of income for future use or investment rather than spending it all. These theories treat every individual the same.

Keynes argued that consumption is a stable function of income and introduced the concept of the consumption function. Expressed as:

$$C = a + bY$$

Where

C represents consumption

a represents autonomous consumption

b represents MPC

Y represents income

When income increases, consumption increases at a slower rate, according to the Marginal Propensity to Consume, which is positive but less than one. As a result, when income rises, the Average Propensity to Consume (APC) decreases.

According to the hypothesis, consumers are primarily impacted by their current income rather than their past savings or future income. Additionally, it is predicated on the short-term psychological stability of the relationship between income and consumption.

While the absolute income hypothesis does a good job of explaining an individual's short-term consumption behavior, it is unable to explain long-term stability in the consumption and income ratios. As a result, economists have developed alternative theories, such as the Permanent Income and Life Cycle Hypothesis.

Relative Income Hypothesis

James Duesenberry proposed the relative income hypothesis, which contends that income affects consumption. Individuals attempt to preserve their social standing through consumption and compare their way of life to that of their peers.

For instance, middle-class families in urban India frequently purchase smartphones, branded clothing, or cars to fit in with others' lifestyles rather than just because they are affordable.

Due to social comparison, households with low incomes may occasionally spend excessive amounts on festivals or weddings. This occurs when a lower-income group mimics the high-income group's consumption habits.

Permanent Income Hypothesis.

According to Milton Friedman's Permanent Income Hypothesis, consumption choices are based on anticipated long-term income rather than fluctuations in short-term income. The majority of temporary income fluctuations are saved.

For instance, salaried workers frequently save money, invest it in fixed deposits, or repay loans rather than using it for consumption when they receive tax refunds or Diwali bonuses. This is due to the fact that they view such income as transient rather than permanent.

On the other hand, if someone gets a long-term promotion or a permanent government job, they might buy a car, upgrade their home, or increase household expenses. This represents consumption based on expectations for a steady income. (Henderson, n.d.)

Regression Model of Consumption

$$C_t = a + bY_t + e_t$$

C_t = Consumption at time

a = autonomous consumption B = MPC

Y_t = income at time

e = All the additional factors

Here, the MPC should be positive, but less than 1.

Short Term Consumption puzzle

$$\Delta C_t = a + B\Delta Y_t + e_t$$

ΔC_t = Change in Consumption

ΔY_t = change in income

Long Term Consumption puzzle

$$\ln C_t = a + B \ln Y_t + e_t$$

$$B = 1$$

More Extended Consumption puzzle

$$C_t = a + \beta_1 Y_t + \beta_2 W_t + \beta_3 R_t + \beta_4 C_{t-1} + e_t$$

Where:

- W_t = Household wealth
- R_t = Interest rate

- C_{t-1} = Past consumption

Major Types of Consumption puzzles:

Despite well-developed consumption theories, empirical evidence often shows behaviour that contradicts theoretical predictions. These inconsistencies are known as consumption puzzles. The most discussed among them are the Excess Smoothness Puzzle and the Excess sensitivity Puzzle.

Excess Smoothness Puzzle

According to intertemporal consumption theories such as life cycle hypothesis and permanent income, the consumption of an individual increases in terms of expected future income. So income is also volatile itself, and consumption is also expected to fluctuate as individuals adjust their expectations.

However, empirical studies consistently show that consumption is much smoother than income, reacting less than theory predicts. This phenomenon is called the Excess smoothness puzzle.

This puzzle is mainly observed when the consumption reacts less than those implied by income shocks. Another explanation is that many consumers face uncertainty and therefore, the smooth

consumption deliberately to avoid future risk. The habits and social norms may prevent the consumer from changing the consumption rapidly.

Excess Sensitivity Puzzle

The Excess Sensitivity Puzzle refers to the finding that responds of the consumption which is significantly to current income changes, however these changes are most likely predictable and temporary. And according to the theory, only unexpected changes in permanent income may affect the consumption in the long term and short term. Temporary income variations or changes mostly saved by the consumer.

In reality, consumption often increases immediately following current income rises, such as bonuses or wage payments. This suggests that consumers are excessively sensitive towards their current income.

Reason behind the Consumption Puzzle Liquidity Constraints
In simple words the meaning of liquidity constraints is, the household cannot borrow against the future income. Permanent income Hypothesis says the people should smooth their consumption over time by borrowing from different sources. When the income of the household is low and when the saving

is high. But in the real world many households don't have proper access to the borrowing market or are facing strict lending conditions. Borrowing requires a good credit score, stable income and much more. Because of these factors the households strongly depend on the current income for consumption. When the income rises then the consumption also rises immediately and income falls the consumption also falls immediately. This contradicts the theory that only permanent income leads to change in consumption, but in reality it depends on the current income. Which creates a consumption puzzle.

Uncertain about future income

People are uncertain about future income because there is unstable income and jobs. When households are unaware about the future earnings, they become cautious in their spending decisions. Even if the income increases today, consumption doesn't increase because of fear of future income loss and unstable income sources.

This uncertainty leads individuals to behave differently from what theories and economic models predict. Not only responding to permanent income changes but, households also react and change the consumption according to the risk perception. This behavior leads to smoother consumption behaviour that is linked to the excess smoothness puzzle.

Borrowing Restriction

Borrowing restrictions is also a reason behind the consumption puzzle. When the household wants to borrow for smooth consumption, banks may impose various restrictions such as collateral requirements, credit score conditions or income proof and a stable job. These restrictions prevent consumers from making smooth consumption overtime.

As a result, the consumption of households depends on the current disposable income rather than expected lifetime or future income. These restrictions make consumption more volatile and sensitive to income shocks, contradicting intertemporal consumption model,

Behavioral Factors (Habits and Myopia)

Most of the traditional models assume that consumers are fully rational and forward looking in terms of choice and decision. But real world behaviour of consumers often differs. Habit formation is one contradictory factor. People tend to maintain established consumption patterns, as habits developed over time are not easily adjusted or changed.

Myopia refers to the short term thinking process of a household. Most of the household depends on the current income for consumption therefore they neglect the future planning. This behaviour of the household contradicts the traditional model. Because of these behavioral factors there are deviations from theoretical predictions that contribute to both excess smoothness and excess sensitivity puzzles.

Empirical Evidence of the Consumption Puzzle

The well known theories of consumption such as the Permanent Income Hypothesis, Life Cycle Hypothesis and the theory of Rational expectation, suggest that most of the individuals changed their consumption level not only on the basis of long term income, but also short term income. When we examine the real time data closely, how people or households actually made their spending decisions. We find people mostly make their spending decisions based on current income or short term income changes, that doesn't match the classical economic theories.

However, the two major patterns that have emerged in real life are excess sensitivity and smoothness.

Excess sensitivity shows that people may increase their consumption or spending much more than expected when their income increases temporarily.

For example:- If someone gets a bonus for a short time, they might spend a large part or spend it all immediately to fulfill needs, despite it being temporary. Classical theories suggest that such a temporary rise in income doesn't affect spending, but the real life data proves this. This suggests that people are influenced not just by long term income change, but also current income play an essential role in spending decisions. The excess smoothness represents that people's spending often remains stable over time despite the change in income being significant.

For Example:- If someone lost their job then they might still try to maintain the minimum by past saving, borrowing or by making minor cuts in expenditure that is autonomous consumption.

Similarly when the income rises in the short term they may not spend it all.

Many research and studies indicate that income always changes because of various factors but consumption doesn't, it is much less volatile. People don't change their consumption frequently. People prioritize keeping their lifestyle steady over drastically

changing spending with each income change. Factors such as saving for emergencies, habits, social norms, borrowing and future planning helps explain this behavior.

So, the consumption arises because the consumption can be too sensitive to short term changes and too stable in the long term. Which doesn't fit with economic theories. Understanding these patterns of consumption is essential because consumption forms a large share of the economy. By understanding the consumption puzzle and factors behind that may help policymakers and economists to make better policies and implementations.

Policies implementation

There is something anomaly about the people's spending habits that policymakers need to understand. Most economies depend on how much people spend in the economy. If their spending is high then the economy grows and if their spending is less then the economy slows down. Because consumption is the major part of the economy. Governments need to understand consumption patterns when the income of people changes. Which helps to frame monetary and fiscal policy. The traditional theories suggest that people's consumption changes when their permanent income changes such as an increase in salary and temporary income change does only affect little. The real world statistics show that people react more to freebies, temporary income, bonus, inflation, trends, emotion, etc. Studying these factors is also crucial. If the policymakers don't understand these policies may fail and control of the economy become weak.

Fiscal Policy Strategy adjustment

Government and policymakers measure the taxes, stimulus payments, or cash injections do not always guarantee an increase in consumption. In many economics mostly households save rather than spend the additional income or temporary income. Therefore, fiscal strategies are more effective when financial support is directed to those households which are more likely to spend frequently. These determinants become a reason for money circulation and increase in economic activity.

Limitations of Monetary policy

Monetary policy expects that lower interest rates will encourage borrowing and spending because people borrow more and spending that leads to stability in the economy.

However, spending does not depend entirely on interest rates and bank rates. In many cases shown that if the borrowing is restricted due to credit constraints or fear of lower future

expected income, a cheaper money supply may not boost demand. Therefore, policymakers need to improve accessibility to the credit market.

III. RECENT RESEARCH AND DEVELOPMENT

In the modern era, academic inquiries have been advanced for the theories that lead to the question of “why an individual spending habits is frequently different from that the economic theories predict?”. Latest research in technology and innovations shows another important factor is behavior. Most of the scholars are now better equipped from traditional ways to anticipate and solve the complexities of theories, that can help to make assumptions to capture the real world dynamics. Recent research is focusing on the current modern problems in the economy such as credit accessibility, financial behavior of people and income sources in different parts of the country. Studies also show that if an individual encounters the restrictions on borrowings they can modify their savings. In many countries, people have easy accessibility to borrowing, but their spending is less. On the other hand some people do not have easy accessibility to borrowing, but their expenditure is very high. The adjustments in the spending does not always match that traditional economics theories predict. According to the classical theories an individual is always rational for their saving and spending. Recent research in behavior economics reveals that people are certainly biased, which is one of the factors that later affect their decision making.

Hand in hand, Most of the consumers often choose short term satisfaction over long term saving and financial goals. Which traditional theories cannot predict and fail.

The classical theories predict that an individual spending becomes lower after retirement because of low income or low income source, but the real world dynamics shows that even after retirement the consumption of an individual is stable and in many cases it is higher than in working years., but the real world dynamics shows that even after retirement the consumption of an individual is stable and in many cases it is higher than in working years. Finding the parameters behind this is very difficult and is not the result of random variations. Modern technology also helps in refining big data and economic analyses.

Now researchers can analyze big data sets to understand people's spending patterns. Modern technology allows them to identify and understand patterns that are not predictable by chance, connections in the spending behavior of the consumer.

The applications of this research can be seen in various sectors to analyze the different patterns of consumer behaviour such as shopping habits of an individual. Many homeowners can not adjust their spending when there is a sudden change in income because they are tied up in the real estate. E-commerce also affects the consumer decision because it is influenced by algorithms and targeted advertising.

These factors can easily influence purchasing decisions that become a reason to update policy frameworks that adjust the amount of the modern era of digital influence. The combination of these factors can be a reason for ensuring the economic models remain relevant and allow effective policy design.

IV. CONCLUSION

This research paper shows the correlation between income and consumption in the consumption puzzle. How the consumptions of the consumer change when their income changes. According to the well known theories of consumption in macroeconomics. The consumption primarily depends on the long-term income changes, according to the real world dataset the consumption is more sensitive to short term income changes as compared to long term. Theories say consumers save the income short term or invest the short term income. And increase the consumption in the long term because of income stability, but in reality consumers spending more frequently in short term income change because of various factors which were discussed above in the research.

This mismatch between theories and real life dataset created an important and difficult challenge for economists and led to the development of alternative explanations. One of the most interesting models to understand the consumption puzzle is The intertemporal theory of consumption by Irving Fisher in 1930. Which argues individuals base their spending decisions not only on current income, but also depends on future expected income or long term permanent income. Which means the consumer lives in two different time periods: future and present.

Consumer consumption is influenced by both time periods. Not only present income and conditions.

Later, this theory was expanded by Franco Modigliani and Milton Friedman in two different ways; The Permanent Income Hypothesis by Milton Friedman in 1957s and Life Cycle Hypothesis in the 1950s by Franco Modigliani.

The Permanent Income Hypothesis by Milton Friedman.

This theory divides income into two different parts: temporary income and permanent income. Temporary income refers to short term income because this income is for a temporary period of time. Permanent income refers to an increase of income in the long term and which is permanent, not just for a short time period. So people plan their consumption for long term income changes not short term income changes.

Similarly, Life Cycle Hypothesis by Franco Modigliani.

This theory says the consumer plans their consumption and savings for their entire life. And consumers try to stabilize the consumption for a long period of time. Which becomes a reason for smooth consumption in the long-term. According to this theory people borrow at a young age, high income in working years and again low income after retirement. Consumers borrow, save and dissave for smooth consumption.

Moreover, these theories there are more recently research has been done which find additional factors that influence consumption decision. Those factors are future income, limited access to credit market, precautionary saving and social norms. All these factors affect the consumption behavior in the short term as well as long term.

Overall, The consumption puzzle has a significant role to understand the economic thought. Because it describe and reveal the limitations in well known economic's simple income based models. It encourages today's economists to develop a more deep and comprehensive framework which considers income expectation, lifetime resources, consumer behavior and imperfections in the market. Understanding of the consumption puzzle plays an essential role for policymakers because consumption behavior strongly influences aggregate demand, economic stability and effective policy implementation.

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