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Analysis of household consumption function based on permanent income hypothesis in Sabah, Malaysia: A conceptual framework

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Abstract: In the past, Sabah has often been reported as Malaysia's poorest state, with the recorded highest incidence of absolute poverty among all the other states. The consumption patterns of households in Sabah have been significantly impacted by such circumstances. This further draws light on the adverse impact on the broader economy, as low levels of spending may restrict demand for products and services, stifling economic growth. The understanding of households' consumption functions based on the Permanent Income Hypothesis (PIH) will advance knowledge in identifying the key factors that influence the households' spending decisions. Pointing out the scant number of past studies done within this very context, and focusing on the Sabah state in particular, further motivated this study, this paper aims to develop a conceptual framework that can estimate and examine the households' consumption functions in Sabah. As such, the methodology of drawing upon narrative reviews from research in the past will be used in this paper to develop the conceptual framework. The result of this study built upon the framework developed will help in identifying the factors that explain the households' consumption patterns, in particular, whether the function estimated will be consistent with the Permanent Income Hypothesis (PIH). It is hoped that the conceptual framework built will aid in providing valuable empirical insight for policymakers in designing effective policies that can uplift households that are living in poverty.

Keywords: conceptual framework; permanent income hypothesis; households' consumption; function; Sabah

1. Introduction

Economic growth is highly correlated with individual disposable income and economic development, with a focus on the quality of life. According to Tapsin and Hepsag (2014), household consumption expenditures are considered a primary indicator of economic well-being, holding significant importance in macroeconomic stability and policymaking. The analysis of national consumption patterns can be of great use to a given country's monetary policymakers, as household consumption growth helps drive economic growth (Al Gahtani et al., 2020). Although there are several consumption function theories, the Permanent Income Hypothesis (PIH) appeared to be widely accepted as the proper application of the theory of the consumer. According to the hypothesis, consumers estimate their ability to consume in the long run and decide on the current consumption based on the appropriate fraction of that estimate (Hall, 1978). Numerous studies (Al Gahtani et al., 2020; De Juan and Seater,

1997; De Juan et al., 2004; Tapsin and Hepsag, 2014) have been done relating to PIH in explaining the households' consumption function. However, the studies in Malaysia have been relatively new with many choosing to focus on the entire population rather than specifically on certain communities.

The Sabah state, which has the highest incidence of absolute poverty with an estimated number of 86,766 people falling under the categories of hard-core, poor, and economically marginalized, was once again named the poorest state in Malaysia in the most recent publication of poverty statistics (Department of Statistics Malaysia, 2021). It is therefore crucial to have a deeper understanding of the consumption patterns at the household level before solutions can be proposed to reduce Sabah's poverty level. Nakajima (2020) stated that household debt has risen sharply around the globe in the past two decades and that debt is seen as playing a more prominent role in economic decisions. Even though there have been innumerable studies on consumers' spending habits, research into how socioeconomic backgrounds influence habits, especially in the context of Malaysia, is still in its early stages (Ali et al., 2021). It is to our knowledge that this is the first study that specifically focused on examining the household consumption pattern in Sabah, one of the poorest states in Malaysia. Besides that, the lack of consensus among academics about the consumption theory that can explain consumer behavior will serve as additional motivation for this study. However, the examination of the households' consumption would require a conceptual framework to be developed to articulate the intervening variables that drive the households' consumption patterns. Hence, the main objective of this conceptual paper is to build the conceptual framework that can be employed for future empirical analysis of the households' consumption function in Sabah.

To exacerbate the issue, the COVID-19 pandemic crisis outbreak left a significant impact on household income and consumption patterns. The recent analysis reported by the Department of Statistics Malaysia showed that the majority of households experienced a decline in real income. No doubt, the changes in real income would result in changes to the spending pattern. Needless to say, it would be beneficial to study the changes by estimating the household consumption pattern function to better understand how families' spending patterns and functions are changing. Ergo, the main objective of this paper is to develop the conceptual framework that can be used later in the empirical research in estimating the household consumption function. The conceptual framework constructed will open the door for researchers to address the research question regarding households' consumption patterns. The knowledge of the households' consumption patterns will be imperative for policymakers to evaluate and further adopt critical policy change. This conceptual paper will provide significant practical contributions through knowledge advancement within this context of study. The subsequent section will briefly discuss the literature review. The theoretical framework is then discussed in Section 3. Next, Section 4 will present the conceptual framework, and Section 5 the discussion of the model specification. Lastly, this paper will conclude by providing potential implications obtained from the research.

2. Review of literature

The Milton Friedman-proposed permanent income hypothesis asserts that

households spend a fixed set percentage of their permanent income on consumption. According to Friedman's (1957) theory, only changes in one's permanent income can influence their consumption. Permanent income refers to the annual equivalent of the revenues that a person anticipates receiving over a lengthy period. Roche (1995) provided two arguments for the need to empirically test the Permanent Income Hypothesis. The first is the hypothesis' implications for policy, particularly in the area of income tax. For instance, if consumers believe that a government policy of tax reduction is permanent, the influence on consumption will be higher. Because lower-income people have a larger Marginal Propensity to Consume (MPC), tax cuts targeted at the bottom of the income distribution are therefore likely to have a greater expansionary effect than tax cuts targeted at the top (Palley, 2008). Second, the PIH plays a significant role in other theoretical discussions, such as the dispute over expansionary fiscal contractions. According to the argument, cutting back on government spending will pave the way for future income tax reductions. As a result, the forward-thinking rational agents will see an increase in their permanent disposable incomes; as a result, they will raise their consumption expenditure, which will lead to an increase in output.

Considering the importance of the PIH policy implications, numerous literatures have examined the empirical validity of PIH. De Juan and Seater (1997) in a cross-country analysis indicated that findings from developed countries demonstrated strong support for the PIH, while the findings from developing countries failed to support the validity of PIH. This implied that countries with high-quality national income accounts were in favor of the PIH, whilst those with low-quality income accounts demonstrated otherwise. Meanwhile, Osei-Fosu et al. (2014) concluded that the PIH holds in explaining the consumption function of Ghana. However, Gupta and Ziramba (2009) did not find PIH fitting in explaining the consumption expenditure data in the US. On the other hand, Manitsaris (2006) revealed that the analysis of the selected 15 European Union member-states provided strong support for the consumption function under the permanent income hypothesis. Liaqat et al. (2018) disregarded the validity of PIH, yet re-affirmed the support for the Absolute Income Hypothesis (AIH) instead in their analysis conducted in China using data from 1970 to 2016. Similarly, Khan et al. (2010) reported findings that were in support of the AIH rather than the PIH for Pakistan. In another study by De Juan et al. (2004), the PIH estimation in 48 contiguous states of the United States provided support to the PIH. However, De Juan et al. (2006) did not report the same findings in their study on the 11 West German states. De Juan et al. (2010) found that 10 Canadian provinces between the years 1961 to 1996 also failed to support the PIH theory.

It is clear from the literature reviewed that the validity of PIH in explaining the consumption function has remained inconclusive and largely ambiguous. The findings from different countries reported varied findings with some in support of the theory and others rejected. In Malaysia, Bakri et al. (2017) examined the behavior of household consumption expenditure and reported that household income has a significant positive relationship with household consumption expenditure. Meanwhile, Ali et al. (2021) analyzed the validity of PIH in explaining the consumption function in Kelantan, Malaysia using the ARDL bound testing from 2000 to 2016. Findings from their study revealed that the PIH is valid in the case of Kelantan with a large

disparity found between the elasticity to consume from current income and the elasticity to consume from permanent income among households in Kelantan. Meanwhile, Yun et al. (2023) attempted a systematic review to provide a better understanding of PIH analysis. However, the study done in Sabah has remained sparse with none being done to the best of our knowledge. Hence, the development of the theoretical framework is necessary as a pre-requisite requirement for future study to be done within this context in the state of Sabah.

3. Methodology

This paper draws upon the narrative review of past research to develop the conceptual framework that can be used in the empirical estimation of the households' consumption function in Sabah. The review will provide insight into the development of a conceptual framework with variables identified as significant in explaining the households' consumption function. In addition, the review of the literature allows us to establish a clear relationship between intervening variables that drive the households' consumption function.

4. Findings: Conceptual framework

In 1957, Milton Friedman formulated the Permanent Income Hypothesis in his work *A Theory of the Consumption Function* (Friedman, 1957). Based on this hypothesis, the consumption of individuals or households depends on the permanent income rather than on the current income of the economic unit as hypothesized by Keynes (Nedomlelová, 2008). The permanent income refers to the average expected income of lifetime resources. This can also be explained that the permanent consumption is equal to the previous yearly income plus a portion of any income adjustments that took place between the previous and current years. Friedman (1957) further argued that the short-run MPC is lower than the long-run MPC due to the volatile nature of income growth. Putting it simply, Friedman's Permanent Income Hypothesis can be defined as a consumer purchasing theory that explains individuals invest their income at a pace consistent with their predicted future average income (Ali et al., 2021). Sustained output and price stability an indicator that every economy strives to achieve.

Following this theory, the uncertainties of income growth will have significant consequences on the consumers' spending behavior. The consumer's expenditure tends to focus on the short-run average tendency to spend and will likely choose to spend less when their income grows despite being well adapted to the higher permanent income that was expressed in the long-run consumption function. This is largely due to the level of uncertainty faced by consumers in pertaining with the expectation of whether the income growth will last. According to Friedman's (1957) theory, the actual income can be divided into permanent components and transitory components (as reflected by Equation (1)), with some restrictions in place, such as zero correlation between the permanent and transitory components and zero serial correlation in transitory components.

$$Y_t = Y_t^P + Y_t^T \qquad (1)$$

The permanent component is to be interpreted as reflecting the impact of those

factors that the unit views as determining its capital value or wealth: the nonhuman wealth it owns; the personal attributes of the unit's earners such as their training, ability, and personalities; the attributes of the earners' economic activity, such as the occupation pursued, the location of the economic activity, and so forth. Meanwhile, all other factors which include factors that are likely to be treated were put under the transitory component. These other factors are often treated as "chance" occurrences, although they can be perceived from another point of view as a predictable result of particular forces, such as cyclical fluctuations in economic activity. Similarly, the consumption function under the Friedman's (1957) theory can be derived as in Equation (2).

$$C_t = C_t^P + C_t^T \qquad (2)$$

To test the hypothesis, it is imperative some necessary steps need to be taken to translate the absence of permanent income and permanent consumption data into a more observable term. As the elasticity of measured consumption concerning measured income is equal to the fraction of the variance of measured income contributed by the permanent component of income, the direct measurement of the permanent income in the case where its variance is equal to the variance of the total income, with the elasticity equal to one, the consumption would hence be proportional to income (Houthakker, 1958). Hence, under the PIH, the Permanent Consumption is determined by permanent income. The equation can be derived as in Equation (3) (Ali et al., 2021).

$$C_t^P = \alpha + \beta Y_t^P \qquad (3)$$

where α, β are parameters to be estimated.

Based on Manitsaris (2006), Osei-Fosu et al. (2014), Gujarati and Porter (2008), and the adoption of Cagan's adaptive expectation model, the following model is formed:

$$C_t - C_{t-1} = \delta(C_t^P - C_{t-1}) + \varepsilon_t \qquad (0 < \delta \le 1) \qquad (4)$$

$$Y_t^P - Y_{t-1}^P = \varphi(Y_t - Y_{t-1}^P) + \varepsilon_t \qquad (0 < \varphi \le 1) \qquad (5)$$

where δ is the partial adjustment coefficient and φ is the adaptive expectations coefficient.

Substituting Equation (2) into Equation (3):

$$C_t - C_t^T = \alpha + \beta Y_t^P \qquad (6)$$

$$C_t = \alpha + \beta Y_t^P + \mu_t \qquad (7)$$

where $\mu_t = C_t^T + \varepsilon_t$.

$$Y_t^P = \frac{1}{\beta}C_t - \frac{\alpha}{\beta} - \frac{1}{\beta}\mu_t \qquad (8)$$

Lagging Equation (8) one period yields:

$$Y_{t-1}^P = \frac{1}{\beta}C_{t-1} - \frac{\alpha}{\beta} - \frac{1}{\beta}\mu_{t-1} \qquad (9)$$

Based on Koutsoyiannis (1977), Equation (8) and Equation (9) are substituted into Equation (5),

$$C_t = \alpha\varphi + \beta\varphi Y_t + (1 - \varphi)C_{t-1} + [\mu_t - (1 - \varphi)\mu_{t-1}] \qquad (10)$$

The final equation is restated as follows

$$C_t = \vartheta_1 + \vartheta_2 Y_t + \vartheta_3 C_{t-1} + \varepsilon_t \qquad (11)$$

where $\vartheta_1 = \alpha\varphi$, $\vartheta_2 = \beta\varphi$, $\vartheta_3 = (1 - \varphi)$, $\varepsilon_t = [\mu_t - (1 - \varphi)\mu_{t-1}]$.

Based on Alimi (2015), and Ali et al. (2021), the conceptual framework is developed by incorporating the variables of households' lag consumption expenditure, real gross domestic product, and real interest rate. The following **Figure 1** shows the conceptual framework developed based on the theoretical framework as discussed in the previous section.
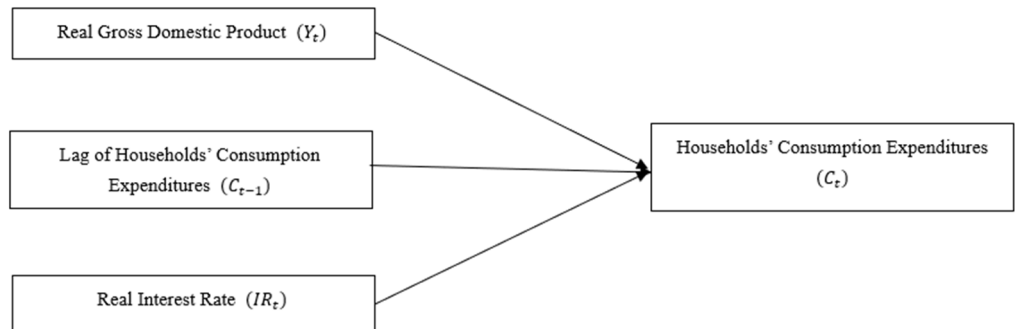
Figure 1. Conceptual framework.

5. Discussion

In this subsequent section, a discussion will be provided on the model specification developed based on the conceptual framework established. Based on the postulated PIH theory, the final model is developed by incorporating real GDP income, lag consumption, and interest rate as independent variables. According to Bano et al. (2018), log-linear conditions provide better and more efficient results than simple linear methods. Hence, the log-linear model is employed in the model developed.

The model specification, therefore, is as follows:

$$lnC_t = \vartheta_1 + \vartheta_2 lnY_t - \vartheta_3 lnC_{t-1} - \vartheta_4 lnIR_t + \varepsilon_t$$

where ϑ is the elasticity coefficient, C_t is the household consumption expenditure, Y_t is income, C_{t-1} is lag consumption, IR_t is the real interest rate, and ε_t is the error term.

According to the PIH, as summarized in **Table 1**, household expenditure on goods and services rises along with household income as denoted in ϑ_2. Empirical studies have provided support for the PIH, for instance, Akhir et al. (2011) provided a micro testing evidence based on the PIH from the East Coast region of Malaysia. Likewise, Ali et al. (2021) discussed on the estimation of household consumption pattern with evidence from Kelantan, Malaysia supporting PIH. Meanwhile, lagged consumption is expected to have a negative relationship with consumption. Carroll (1992) predicted an adverse relationship between lagged consumption and current consumption, claiming that households adjust current spending in a manner that is less than proportional to changes in current income. The justification for this pattern can be best explained by the habit persistence, a hypothetical process by which households take prior expenditure patterns into account when making present-day purchases. Finally, higher interest rates may discourage borrowing and encourage saving, which could lead to lower levels of consumption, which could explain the negative relationship between interest rates and consumption. The model specified is developed is clearly in line with the established theories. Meanwhile, a subsequent analysis was done on each of the variables in the Sabah state to provide a better understanding of

the relevancy of the developed model with the local state.

Table 1. Description of variables and expected relationships.

| Variable	Description of variable	Measurement of variable	Source	Theoretical expected signs (long-run)
Household consumption expenditure	Household consumption expenditure is the expenditure for private consumption on goods and services during the reference period.	Ringgit Malaysia	Department of Statistics	Dependent variable
Household lag consumption expenditure	Household consumption expenditure is the expenditure for private consumption on goods and services during the previous period.	Ringgit Malaysia	Department of Statistics	Negative
Real gross domestic product	GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.	Ringgit Malaysia	Department of Statistics	Positive
Real interest rate	The real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator.	Percentage	Department of Statistics	Negative

5.1. Household consumption expenditure

According to the Department of Statistics, household consumption expenditure refers to the expenditure for private consumption on goods and services during the reference period. This expenditure includes the following:

- All purchases made by household members for their use of goods and services, whether they are made with cash or credit. Taxes on goods and services are also included in this category of spending.
- All free or discounted goods, services, and facilities received in kind are counted as expenses. For instance, free or discounted hotel and meals.
- Items for personal use. For instance, the household was charged retail prices for crops gathered from his farm or products purchased from his shop.
- The owner-occupied home's net rental value was also counted as an expense. This rental value must be estimated using the current market value of homes of a similar type in the same neighborhood.

Figure 2 shows the household consumption at a constant price in the state of Sabah from 2010 to 2021. A consistent increasing trend of household consumption expenditure can be observed in **Figure 2**. Meanwhile, **Figure 3** illustrates the median and mean of monthly household consumption expenditure in the administrative districts of Sabah during the year 2019. The findings recorded the city of Kota Kinabalu with the highest mean and median household consumption expenditure. Meanwhile, the Beluran district was recorded with the lowest mean and median value of household consumption during the year 2019. The pandemic crisis has no doubt affected household consumption expenditure causing a decline in spending during the year 2020. By 2021, the slow revival of the economy post-pandemic allowed household consumption spending to slightly increase. Since consumption is a function of income, a positive relationship is well expected between current consumption and

lag consumption. As such, the conceptual framework developed incorporated both the lag consumption and current household consumption expenditure.
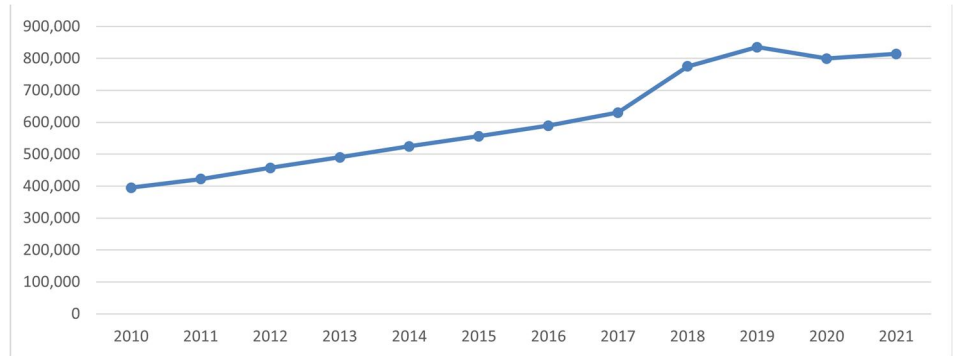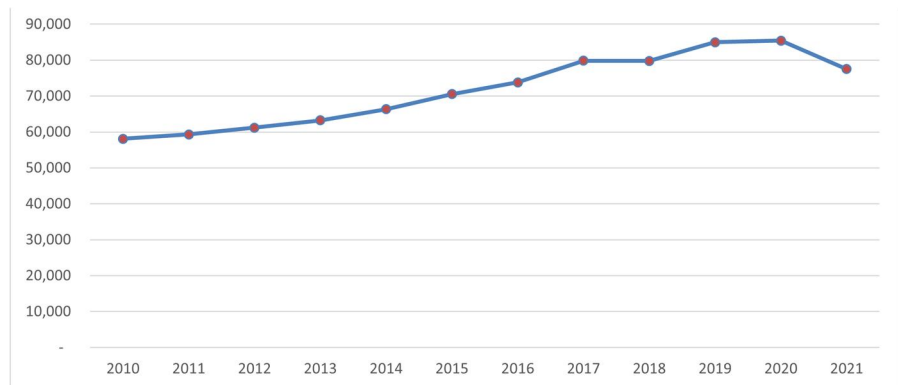

Figure 2. Household consumption expenditure at constant price, 2010–2021.
Source: Department of Statistics Malaysia (2022).
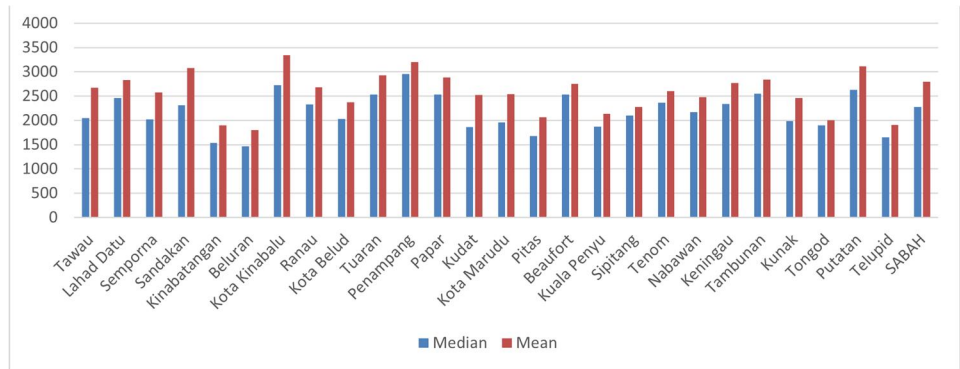
Figure 3. Median and mean of monthly household consumption expenditure by administrative district, Sabah, 2019.
Source: Department of Statistics Malaysia (2022).

5.2. Real gross domestic product

Meanwhile, **Figure 4** demonstrates the real gross domestic product from 2010 to 2021. According to De Juan and Seater (1997), the result in the support of the PIH theory is driven by the state of economic development as well as the quality of national income accounts.


Figure 4. Real gross domestic product (RM Million), Sabah, 2010–2021.
Source: Department of Statistics Malaysia (2022).

5.3. Real interest rate

Figure 5 shows the real interest rate which has been adjusted for inflation. Inconsistent with past studies (Ali et al., 2021; Alimi, 2015), the effect of interest rate on consumption has been incorporated as one of the primary factors that determine household consumption expenditure. According to McKinnon (1973), the basic hypothesis is postulated that individuals tend to consume a proportion of their permanent income in each period. In other words, the Average Propensity to Consume (APC) would be equal to the Marginal Propensity to Consume (MPC). However, the propensity itself would vary with factors such as the interest rate. In addition, the interest rate was included in the model to avoid misspecification errors (Osei-Fosu et al., 2014). Hence, the incorporation of both the interest rate and real gross domestic product factors is deemed necessary.
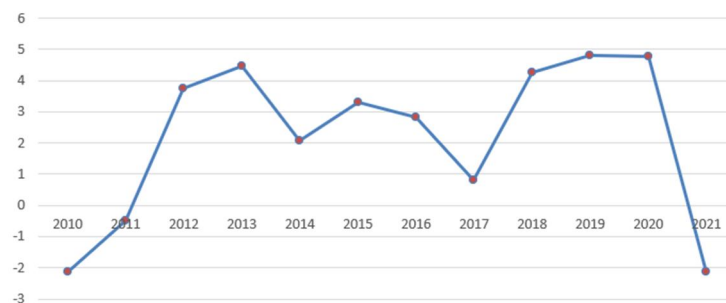
Figure 5. Real interest rate (%), 2010–2021.

Source: Department of Statistics Malaysia (2022).

6. Conclusion

The literature reviewed provided a theoretical framework that examined the empirical validity of PIH in explaining the consumption function in the respective countries studied. Next, this paper has presented a conceptual framework to show how research can be implemented within the same context in the state of Sabah. As none of the studies has been found to give specific focus to understanding the household consumption expenditure by states, this paper will serve as a preliminary study in building the conceptual framework that can be used in our empirical study of testing the validity of PIH in Sabah. This conceptual paper will set out to explore the household consumption expenditure function and to stimulate debate in this important but complex area. The devised framework will assist us in planning more effective future empirical research in this very area. Based on the conceptual framework laid out, the real gross domestic product, lagged household consumption, and real interest rate are critical drivers to be considered in the estimation of the household consumption function.

This conceptual paper will provide knowledge advancement through the presentation of a conceptual framework that can be used to gather insight into the households' consumption function in Sabah. Estimation of the households' consumption function will be useful for policymakers to evaluate the effectiveness of the current fiscal and monetary policies in supporting macroeconomic stability. Besides that, the knowledge of the consumption function is vital for them to anticipate

and respond accordingly to economic changes such as recessions or periods of economic growth. In addition to that, a forecast of consumer behavior can be done based on the findings to help businesses make informed decisions. It is necessary to point out that the limitation of the study in examining the population in general may not be useful for the design of effective policies that can help the communities in target, particularly, those in poverty. In such a case, this conceptual paper can address such limitation by filling the literature gap in devising a conceptual framework that serves the purpose of estimating households' consumption function by focusing on the communities in a single state.

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