Regional Consumption Inequalities in Pakistan under Relative Income Hypothesis

Mehr U Nisa Ishtiaq[1], Tahira Tauheed[2] and Isma Ishtiaq[3]

Abstract

In this paper panel analysis is being carried on original Relative Income Hypothesis (RIH) and its other modifications over the time span of 1998 to 2015. To furnish reliable and appropriate estimation, Households Integrated Economic Surveys (HIES) based consumption and income variables have been gone through various stages of data filtering. The findings of Feasible Generalized Least Squares (FGLS) significantly validate the relevance of three types of ratchet effects (income, consumption and habit) in provinces. Average Propensity to Consume is highest for Baluchi's households followed respectively by Pashtuns, Punjabi, and Sindhi. The selection of constant slop model implies that province-wise there is no difference in magnitudes of ratchet effect obtained from various versions of RIH. All provinces make adjustments in long run to their consumption in response to income fluctuations. Estimated marginal consumption propensities are according to economic theory that shows smooth consumption path in short run as well in the long run. Polices should be formulated to switch consumer mind set from consumption oriented to saving oriented with the help of appropriate tool of fiscal and monetary policies.

Keywords: Relative income hypothesis, Ratchet effect, Propensity to consume, Feasible generalized least square, Random effect, Interpolation techniques.

JEL classification: C12, C23, C52, C63, D12, E71, E21

1.   Introduction

In literature of economics most debatable topic is consumption (Bilgili and Bağlıtaş, 2016). In one way several economic and social factors alter consumption pattern, whilst on other way consumption analysis not only helps policy makers to formulate appropriate policy but also guide market participants (Caglayan and Astar, 2021). No one can deny the importance of consumption expenditures as it constitutes a major share in aggregate demand (Bonsu and Muzindutsi, 2017). Consumption behaviour determines standard of living and economic growth

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[1] M Phil Scholar Department of Economics, Lahore College for Women University, Lahore, Pakistan
[2] Associate Professor of Economics, Govt. Post Graduate College Township, Lahore, Pakistan
[3] M Phil Scholar Department of Economics, Lahore College for Women University, Lahore, Pakistan
Corresponding Author's Email: nisa.ishtiaq@yahoo.com

(Slesnick, 2000; Stiglitz , Sen, and Fitoussi, 2010; Gerstberger and Yaneva, 2013; Ezeji and Ajuda, 2015). In economic theory the concept of consumption plays significant role. Consumption is the only cause of production. (Boulding, 1945). As aggregate demand is highly influenced by one factor so precise assessment of consumption is required for effective economy administration (Khan and Ahmad , 2014). Consumption theory explains the nexus between consumption and income (Ammad and Ahmed, 2018; Bibi, 2010).

There has been a great deal of debate about income and consumption analysis and numerous hypotheses have been proposed to study household consumption patterns. Among these hypotheses consumer is supposed to be physical being while ignoring societal features of his/her life (Singh and Kumar, 1971). Consequently, many introductory textbooks of economics take consumption analysis quite simple and rational process (Microeconomics in Context, 2014). The hypotheses based on the relationship between income and consumption includes Keynes' Absolute Income Hypothesis (AIH), Friedman' Permanent Income hypothesis (PIH), Duesenberry' Relative Income Hypothesis (RIH), and Modigliani' Life Cycle Hypothesis (LCH). All of these hypotheses attained great attention at their times. AIH is proposed by Keynes (1936) which postulates that consumption is a function of household's absolute income (Bibi, 2010). This hypothesis considers absolute income a sole determinant of consumption which is actually one side of coin because many other determinants i.e., social aspects may also affect consumption as well in varying magnitude. Keynes describes that APC diminishes as disposable income rises. The MPC will be less in the short run (during a recession or a boom period) as compared to long run. In year 1940, Simon Kuznet disagrees with Keynes' analysis of long-run MPC by discovering that in the long run aggregate consumption function is proportional to disposable income (Glahe, 1973).

The RIH could not sustain its prominence in economics discipline due to the ignored societal factors. This hypothesis based on two effects named ratchet and demonstration effect. Ratchet effect refers to households' refuse to decline in consumption when their income declines (Dwivedi , 2005)[4]. It is found that consumers imitate neighborhood consumption patterns in demonstration effect (Hadden J. , 1965) .

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[4] Duesenberry describes that motivation to attain high consumption standards is linked with the desire to imitate other people's consumption behavior (Sun and Wang , 2013).
[3] See literature review

Permanent Income Hypothesis formulated by Milton Friedman (1957), proposes that household's consumption level depends on the proportion of their total lifetime resources i.e., proportion of their permanent income instead of their disposable income. PIH states that measured consumption data always contains temporary fluctuations around the long run permanent consumption function. The true long run consumption function can only be obtained when transitory components are eliminated.

Modigliani-Bumberg assumes (1963) that all individuals consume a constant percentage of present value of their lifetime income. The individual or families try to maximize their utility derived from their lifetime consumption. For this reason, they continue consuming even in the times when income discontinues. To smooth the lifecycle consumption people saves to finance their retired life. According to LCH the APC of an individual is higher in young and old ages as compared to the middle age. Because old people spend their lives on savings while young people are more interested in borrowing, whereas middle-aged people tend to have higher incomes with lower consumption and higher savings (Alimi, 2013). PIH and LCH enlarge the list of determinants of consumer behavior and to some extent both theories are same. But there is one limitation of PIH i.e., Friedman does not describe any specific horizon for the optimization problem of consumer he considers consumption-smoothness for an adequate long-term period. This problem is solved by R.E. Brrumberg, Albert Ando, and Franco Modigliani in 1963. In their theory of LCH they not only provide the formal presentation of the problem with a defined optimization horizon but also consider distinct features of different periods in an individual's life when the periods are not homogeneous (Silvo , 2011).

The theme of all pioneered theories is based on consumption and income relationship whether it is Absolute Income Hypothesis, Life-Cycle Hypothesis, or Permanent Income Hypothesis. Only Relative Income Hypothesis (RIH) enhances this limited version of income-consumption relationship by adding the dimension of social aspects in consumption behaviour. There are evidence which support the argument that relative income affects consumption behavior strongly (Christen and Morgan, 2005). Various dimensions of consumption have been analyzed but there are still some aspects that require further investigation and research should be expanded to subnational levels. Due attention has been not paid on the social aspects of consumption behavior. RIH is among single of few theories that incorporate the ignored social factors into hypothesis and elaborates that income significantly affects the consumption behavior (Morgan and Christen, 2003).

Worldwide rreshaping patterns of consumption will lead to reduce the income gap between rich and poor. Rapid economic growth in emerging economies compels consumer to spend less on food and more on transport, goods, and services that will cause to create pressure on global infrastructure and climate. The winners are the poorer countries i.e., sub-Saharan Africa and India followed by China and advanced countries (Hellebrandt and Mauro, 2016). Change in consumption behaviour also change production pattern of limited produce products that engender factor of productions at regional and global level (Sharma , Nguyen , and Grote , 2018).

Pakistan is a developing country with a high proportion of household consumption expenditure. According to the report published by Ministry of Finance 2012-13, Pakistan is identified as consumption led economy. In year 2019 Pakistan's household final consumption expenditure accounts 82.85% of Gross Domestic Product (GDP) (The World Bank, 2021). Likewise other developing countries there exists big change in consumption pattern of Pakistan. Increase in income accelerates consumer's consumption while rich one increases spending on luxuries and poor households try to cover their basic necessities. Fluctuations among households' consumption pattern exists in developing countries (Shahzadi, 2010). In Pakistan consumption dissimilarities can be seen at provincial and regional levels. These consumption fluctuations are associated with many factors among which income is significant one (Hina and Abbas , 2021).

This fact highlights the importance and need to investigate intense nature household consumption patterns in Pakistan. Like Pakistan, there are few studies that examine the RIH with reference to other countries (Francisco et al., 2005; Corrales and Mejia, 2009; Francisco and Ngo, 2011). The findings of all these described papers highlight the importance of consumption behaviour instead of income in describing standard of living. Analysed countries in these researched articles are different in economic sense. It shows that whether country is developed or developing in nature, relative standing has important role in making their country's people consumption decisions. On the contrary to Adam Smith, Easterlin (1974) considers importance of relative income as consumption behaviour's determinant. There are also evidences that absolute and relative income are equally important for consumer while making decision based upon the properties of goods (Francisco et al., 2005).

This research analysis significantly contributes to the prevailing literature by incorporating modern requirements of research that would help policy makers to formulate policy by keeping in mind provincial consumption behavior under

RIH. Structure of present paper consists of four parts, first part is based on paper's theme, and second part reviews the existing literature about consumption behavior. Third part is about methodological plan, data, and estimated results. Fourth part concludes present study.

2.   Literature Review

The consumption theory has been the theme of innumerable theoretical and empirical research. Keeping in view the subject of present study, the literature review presented in this section focuses on the studies that explore consumption-income relationship with social factors qualitatively and quantitatively. Investigation about determinants of consumption remains limited up to 1940's. Duesenberry (1949) introduces societal influences as another determinant of consumption and explains the concept of Smith, Marx and Veblen in his analysis. As part of his book Income, Saving, and the Theory of Consumer behaviour, Duesenberry reformed Keynes' consumption function into RIH. He views consumption as a social process not the individual one (Corrales and Mejia, 2009). According to him consumption alone does not create utility, it is created in relation to other people's consumption. And for a consumer the number and strengths of impulses to consume more depends on the ratio of his expenditures in comparison with other individuals. These effects found to be more powerful in low-income brackets than high income. This implies that low-income people often interact with consumers having superior consumption habits than high income receivers. This fact highlights another important part of RIH i.e., Demonstration effect. In this effect person imitates his next-door neighbor and in keeping up Joneses theory he tries to narrow the consumption gap with other person that is next to him on a higher standard of living. Despite of its undeniable aspect this theory confronted much criticism due to its social interactions. This theory of consumption soon disappeared from the field of consumption behavior with the arrival of Modigliani and Friedman.

A new element in the RIH is given by Frank in 1985, according to his theory of positional goods not only people differ in their own assessment of commodities, but the value function also lies in the others individuals' commodities. Frank modifies the RIH by adding the component of utility maximizing function. But he makes the society's maximization problem of utility complex as utility becomes the function of both the relative and absolute income/rank (Verme , 2013). Koçkesen (2008) describes implication of Duesenberry's theory and describes that consumption creates negative externalities in a society which is not considered in analyzing individual decision-making process. People work more to upgrade their

status relative to the society's optimal level. Koçkesen unveils one important aspect of the RIH that induces people to indulge in over working and over consumption process.

One drawback of Duesenberry theory is that he did not describe the time length of the emulating process. Cuadrado and Long (2011) presents the lifetime version of RIH and overcome the weakness of time length by considering an overlapping generation economy with heterogeneous wealth levels. Individual utility depends on leisure, relative consumption and bequest which means that individual's consumption is derived by comparing their lifetime income with income of his/her reference group. Due to comparison individual would over-consume, over-work and under-save relative to the welfare maximizing levels. This paper not only describes the problem but also suggests the cure by giving the simple tax schedule that induce the competitive economy to achieve efficiency.

A strand of literature critically and empirically analyzes the various consumption theories. Singh and Kumar (1971) in their empirical analysis cast the vote for RIH by suggesting that RIH represents the consumption behavior for all the countries analyzed in the study. Findings conclude that the process of habit formation is continuous contrary to what was implied by Duesenberry's original specification and consumption is a better indicator of living standard as compared to income[5]. He highlights Honduras and Guatemala as underdeveloped countries and their Marginal Propensity to Consume (MPC) is higher than developed countries. Based on this article, present study comprehensively analyzes the consumption behavior by using more sophisticated and modern econometric techniques.

In (1974) Richard Easterlin added happiness in consumption analysis. His study describes that the RIH matters for consumption analysis and happiness increases with rising income in a given time period as it is a psychological fact. Happiness may remain same when there is no rise in income. Moreover, people of different countries are equally happier at different income level. Individual's utility depends on both relative and absolute income. According to Easterlin (1974) relative income is important determinant of consumption behavior. However, some other studies Alpizar, Carlsson, and Stenman (2005) find that both absolute income and relative play their roles in analyzing consumption behavior and consumer always make decisions on the basis of the properties of goods. Varied results are observed in their study, relative income is importance for consumption decision of

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[5] Original Duesenberry chose current income relative to past peak income for explaining consumption expenditure (Akhtar, Estimating consumption functions for Pakistan, 1983).

non-positional goods like vacations and insurance, while the consumption decisions about positional goods like cars and housing are based on absolute Income. Ahmed , Baloch, Khan, and Memon (2015) analyze the consumption behavior for randomly selected high-income countries like Australia, Korea, New Zealand and Singapore. Their findings indicate that in short run households of these countries follow the rule of thumb while in the long run their consumption pattern follows the PIH[6].

Palley (2008) presented Keynes, Friedman, and Duesenberry's seminal contributions in his work. Based on the findings of this study, rich household consumption is higher and Average Propensity to Consume (APC) is lower. As a result of keeping up Joneses' behaviour, consumption inequality is less than income inequality. Lower income households spend proportionately more of their income as compared to rich households.

A considerable number of studies investigates the consumption-income relationship with reference to Pakistan. Akhtar (1983) analyzes the consumption behavior in Pakistan under various hypothesis. According to him, income-related variables are better predictors of consumption than habitual consumption. The major drawback indicated by author himself is the utilization of data of East and West Pakistan over the time period of 1959-60 to 1978-79. OLS and 2SLS techniques are used in order to eliminate the simultaneous bias in regression models. Results indicates negative income ratchet effect due to the short-run irreversibility proposition for Pakistan. Khan and Ahmad (2014) use both the primary and secondary data to test the consumption hypotheses in Pakistan. The findings confirm the presence of AIH and income ratchet effect in Pakistan. Ammad and Ahmed (2018) analyses the aggregate consumption function under the PIH for Pakistan based on the Cagan (1956) and Gujrati and Porter (2009) methodologies. Their study proves that there is no significant role of past consumption on the present consumption decision. This study rejects the existence of PIH under adaptive expectations and cast vote in favour of the (AIH) for Pakistan. Khan et al. (2015) analyse people consumption behaviour in the light of RIH for the two villages of Peshawar, Pakistan. Results confirm the existence of RIH. Study is limited in scope as it takes only two villages of city Peshawar.

The literature review presented in this section highlights the existing research gap in empirically analysis of RIH with reference to Pakistan. The study on RIH excecuted by Akhtar (1983) is a national level analysis and is subject to serious data problems. The scope of Khan et al. (2015) is quite limited as it analyses

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[6] Rule of thumb refers to those consumers who consume according to the current income. This is the simplest representation of AIH (Rodepeter and Winter , 2000).

RIH for two villages of district Peshawar in Pakistan. The important role of social aspects in determining consumption behaviour and lack of research in this direction provides the rationale of this study. In this research the various types of ratchet effect proposed by RIH are investigated at provincial levels in Pakistan.

3.   Data and Methodology

3.1   Methodological Framework

The methodological framework has been illustrated in Figure 1

3.2   Data

Required data of this study, income and consumption are proxied by household average income per capita and household average consumption per capita respectively. This data is multiplied by twelve to convert it into the annual data following the standard practice exercised by Pakistan Bureau of Statistics (PBS). The statistics is obtained from various rounds Household Integrated Economic Survey (HIES). This analysis consists of four provinces of Pakistan i.e., Punjab, Sindh, Balochistan, and Khyber. This paper does not cover other Pakistan administrative areas like Azad Jammu and Kashmir and Northern Areas due to non-availability of data. All the surveys of HIES (1998-99, 2001-02, 2004-2005, 2005-2006, 2007-2008, 2010-2011, 2011-2012, 2013-2014 and 2015-2016,) report statistics on consumption and income in per capita terms except 1998-1999 survey. To convert aggregate consumption and income for the year 1998-1999 into per capita form, the average household size is obtained from Pakistan population census 1998.

The HIES is conducted on alternative years which provides few observations i.e., 36. In order to increase this observation bracket to 72 various techniques of interpolation i.e., Linear, Catmull-rom, cardinal and piecewise hermite are employed. On the basis of SIC, BIC, HQ, R^2, Root Mean Square Error (RMSE), Mean Absolute Error (MAE) and D-W for each provincial time series the most appropriate technique among is chosen. Efficient models has MAE close to zero, relatively low RMSE than other models, high R^2 and lowest values of SIC, BIC, and HQ. (Mombeini and Chamzini, 2015; Norazian et al., 2008)[7].

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[7] See Appendix A.1 for evaluated interpolated series.

Figure 1: Methodological Framework

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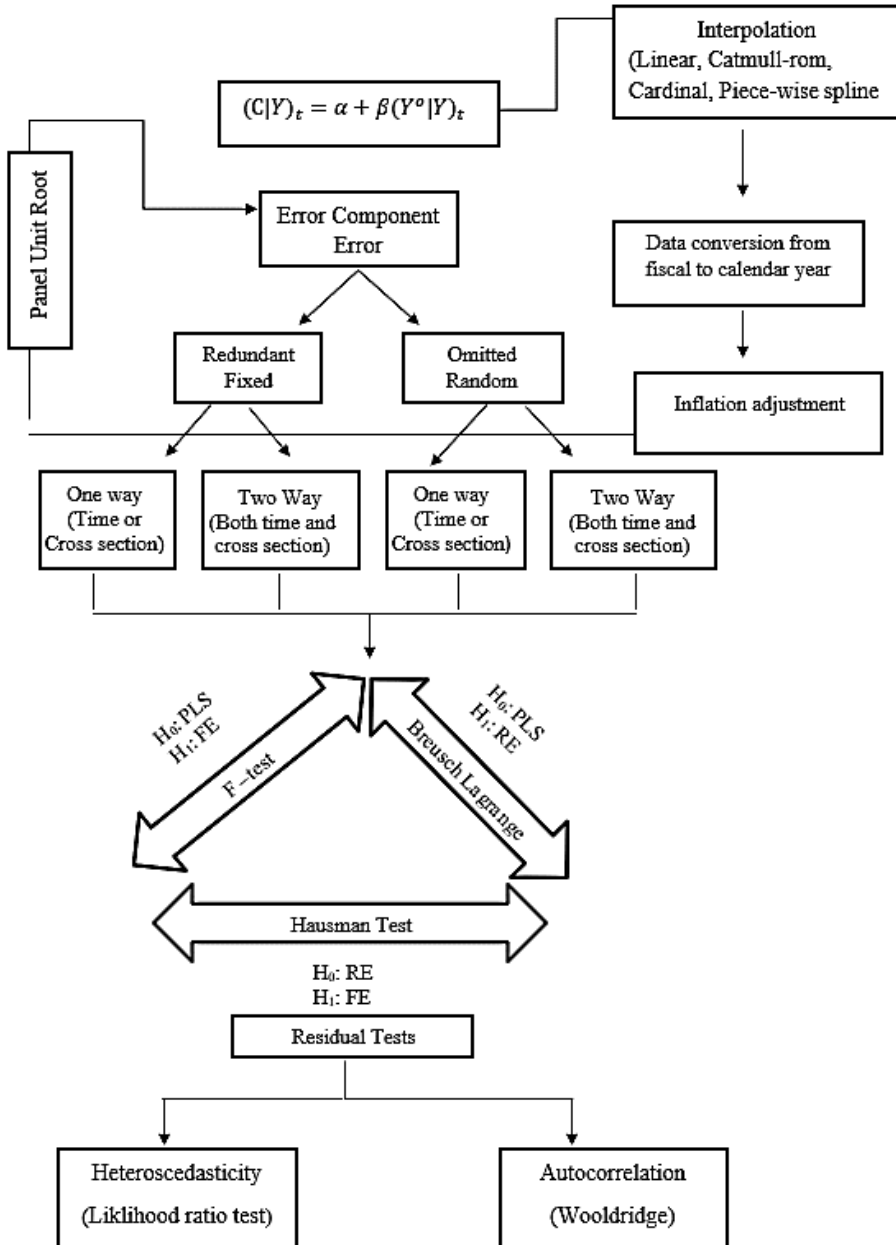
After interpolating the missing data, all the series are converted from fiscal to calendar years[8]. To remove the inflation effects, nominal data is converted to real data by using the Consumer Price Index (CPI) of year 2010. Five panel unit root stationary tests Fisher-ADF test, IPS, Breitung LLC, and Hadri test have been used to obtained reliable and accurate results[9].

Error component model is used to decide whether there is one way or two-way error components (time and period effect) in estimated model[10]. Hausman test applied to check the appropriate model among Common Constant (CC), Fixed Effect (FE) and Random Effect (RE) models[11]. At the first step, F-test test is used to select between CC and FE technique. A p-value less than given level of significance leads to the selection of FE. At second step, Hausman test is applied to select appropriate method between RE and FE. If the p-value is greater than given level of significance, the RE technique is selected. At last step, Breusch-Pagan LM test is adopted to choose appropriate method between RE and CC. RE is selected, if p-value is less than level given level of significance. FGLS estimation technique is applied to estimate the random effect models which assume contemporaneous correlation among regressors. If FE model is selected based on F-test, then apply Breusch-Pagan and Hausman test. However, if CC model is selected by F-test test then first apply Hausman and then apply Breusch-Pagan LM test[12].

All estimation process is applied on the prescribed specification of Evans (1967). This paper estimates original as well as modified versions of RIH as every specification involves improved explanatory power but restrict to compare the efficiency among proposed models. Original RIH form including its modified versions are cited below as well as the formulae of marginal propensity to consume for short run (SRMPC) and long run (LRMPC) from Eq.1 to Eq.12. Long run APC is equal to LRMPC, to get short run APC mean values of independent variables are used Hadden (1965).

1. Original Duesenberry Model

$$\left(\frac{C}{Y}\right)_t = \alpha + \beta \left(\frac{Y^0}{Y}\right)_t \tag{1}$$

$$\text{SRMPC} = \alpha \tag{2}$$

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[8] Formula is explained in Technical Appendix, available upon request.
[9] For reference see (Brooks, 2008; Kucukkocaoglu and Gokten , 2018; Nguyen and Nilsson, 2014).
[10] For reference see (Brooks, 2008; Kucukkocaoglu and Gokten , 2018; Nguyen and Nilsson, 2014).
[11] These methods are also used to estimate dynamic panel models as number of cross sections are less than number of time periods that violates the assumption of two step GMM models. So, this analysis cannot use 2SLS and GMM for dynamic panel models.
[12] For reference see Zulfikar (2018)

LRMPC= $\frac{\alpha(1+\lambda)+\beta}{(1+\lambda)}$ (3)

2. Duesenberry-Eckstein-Formm (DEF):

$\left(\frac{C}{Y}\right)_t = \alpha' + \beta' \left(\frac{Y^0}{Y}\right)_t + \gamma' \left(\frac{C}{Y}\right)_{t-1}$ (4)

SRMPC= $\alpha' + \gamma'(C|Y)_{t-1}$ (5)

LRMPC= $\frac{\alpha'(1+\lambda)+\beta'}{(1+\lambda)(1-\gamma')}$ (6)

3. Davis Model:

$\left(\frac{C}{Y}\right)_t = \alpha + \beta \left(\frac{C^0}{Y}\right)_t$ (7)

SRMPC= α (8)

LRMPC= $\frac{\alpha(1+\lambda)+\beta}{(1+\lambda)}$ (9)

4. Modified Davis Model:

$\left(\frac{C}{Y}\right)_t = \alpha' + \beta' \left(\frac{C^0}{Y}\right)_t + \gamma' \left(\frac{C}{Y}\right)_{t-1}$ (10)

SRMPC= $\alpha' + \gamma'(C|Y)_{t-1}$ (11)

LRMPC= $\frac{\alpha'(1+\lambda)+\beta'}{(1+\lambda)(1-\gamma')}$ (12)

$\therefore \lambda = \left(\frac{last\ value}{first\ value}\right)^{\frac{1}{n}} - 1$

In all above stated specifications C_t, , Y_t^0, C_t^0, λ, Y_t, and $(C|Y)_t$ symbolised per capita consumption expenditure, past peak per capita disposable income past peak per capita consumption expenditure, income growth rate, real per capita disposable income, rate, and APC in year t, respectively.

A diagnostic analysis of the estimated model is carried out by applying Wooldridge and Liklihood ratio tests for autocorrelation and heteroscedasticity respectively.

3.3   Descriptive Statistics

Descriptive statistics of all provincial's consumption and income series are exhibited in Table 1. The range for most of variables is narrow which depict that the observations are clustered around their mean values. It is evident from the

standard deviation that among all series income ratchet effect shows the highest variability. It shows variation among the provincial incomes.

Table 1: Descriptive Statistics

	C^0/Y	Y^0/Y	$(C/Y)_{t-1}$
Mean	0.930927	0.927691	0.977873	0.929357
Median	0.97617	0.889791	0.998163	0.97617
Maximum	1.069659	1.390516	1.354007	1.069659
Minimum	0.300895	0.61425	0.700982	0.300895
Std. Dev.	0.123026	0.16278	0.14638	0.125884
Sum	63.30302	59.37222	62.58388	59.47887
Observations	68	64	64	64

3.2 Selection of Error Component Model

The results for Redundant Fixed Effect model and Omitted Random Effect model for all versions of RIH are reported in Table 2.

This study uses one-way error component method (fixed cross section) for Original Duesenberry, DEF and Davis Models and fixed time and period effect component for Modified Davis Model, if fixed effect method is selected for estimation. The estimation results of Omitted Random Effect Models depict that there is a significant evidence for one-way cross section random effect in Original Duesenberry, Davis, and DEF models while in Modified Davis Model neither cross section nor time random effects are found to be significant.

Table 2: The Findings of Redundant Fixed Effect and Omitted Random Effect Models

Tests	Two-way effects	Cross-section effects	Time effects
For Original Duesenberry Model			
χ^2	50.9928*	40.7803*	18.1577
Breusch-Pagan	64.5075*	62.6968*	1.8107
For Duesenberry-Eckstein-Formm			
χ^2	28.0388***	6.6926***	1.1558
Breusch-Pagan	0.1658	0.0186*	0.1472
For Davis Model			
χ^2	43.4953*	28.9667*	18.2101
Breusch-Pagan	30.9893*	30.3438*	0.6455
For Modified Davis Model			
χ^2	26.6708***	5.1614	21.6141
Breusch-Pagan	0.3111	0.1408	0.1702

Note: The "*", "**", "***" represents 1%, 5%, and 10% level of significance.

3.5 Selection of estimation technique for Panel data

It can be observed from the Table 3 that random effect technique is most appropriate for the estimation of all specifications of RIH's models.

Table 3: The Findings of Model selection

For Original Duesenberry Model						
Error component	F test		Breusch Pagan Lagrange Multiplier test		Hausman test	
Cross section	CC	FE	CC	RE	FE	RE
χ^2	10.51*		62.70*		0.00	
Decision	FE		RE		RE	
For Duesenberry-Eckstein-Formm Model						
χ^2	18.60*		0.01		6.05**	
Decision	FE		CE		RE	
For Davis Model						
χ^2	10.43*		30.34*		1.07	
Decision	FE		RE		RE	
For Modified Davis Model						
χ^2	18.40*		0.31		1.82	
Decision	FE		CE		RE	

Note: The *'** represents 1% and 5% level of significance respectively

3.6   Analysis of Estimated Models

3.6.1   Results

It is evident that the estimated values of intercept term ($\hat{\alpha}$) are distinct and the estimated slope coefficients ($\hat{\beta}, \hat{\gamma}$) are same for all the provinces obtained from each form of RIH, see Table 4. To test the hypothesis that the slope coefficients are same in various RIH models for all the provinces Linear Mixed Models test is utilized. It is exhibited from the findings of Linear Mixed Models tests that there is no significant difference between the same and separate slope models for RIH specifications[13].

The various versions of estimated RIH models show significant income ratchet effect for all provinces. It demonstrates that in all the provinces households give importance to their peak income while determining their current consumption. The income ratchet effect lies in the range of two percent to five percent.

The results indicate the existence of consumption ratchet effect (C^0/Y) and habit persistence influences in all the provinces. Magnitude of coefficient of consumption ratchet effect is same as that of income ratchet effect (Y^0/Y) which shows that peak consumption is equally important as the peak income for the household purchasing decision. The habit persistence effect is stronger than not only peak consumption but is also larger than income effect. This result demonstrates that habit persistence effects the actual average propensity to consume (C/Y) and the desired average propensity to consume by previous peak income and previous peak consumption relative to that permitted by current

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[13] For detail results see (Appendix A.2 and Appendix A.3), available upon request.

income[14]. The value of habit persistence effect lies in the range of 0.48 to 0.58 that is manifold greater than the magnitude of income and consumption ratchet effects.

The values of $\gamma = 1 - \hat{\gamma}$ obtained from Table 4 demonstrates that the values of coefficient of adjustment for all the provinces are 0.42 and 0.52 respectively from DEF and modified Davis models. It shows that forty-two percent to fifty-two percent of discrepancy between the desired and actual consumption is eliminated in a year. Speed of adjustment exhibits that household in all provinces quickly narrow down the gap between desired and actual consumption.

3.6.2 Discussion

The estimated propensities to consume reveal that the low-income households (Balochi and Pashtun) tend to consume more as compared to the rich ones (Punjabi and Sindhi). Average Balochi' household spends at least more than 90% of his income on goods and services. These findings are in accordance to Hadden (1965) which demonstrates that the low income households have low savings. Hina (2017) associates this high APC trend with personal sense of insecurity in Balochistan[15]. According to Pasha (2015) Balochistan stands at the last place regarding per capita income among provinces[16] Cheema, Saleem, Rehman and Atif in (2018) state that poverty is one of the expected reasons of low saving in Balochistan households. Balochi people respond significantly towards all three ratchet effects (income, consumption and habit) $(C/Y)_{t-1}$. It can be exhibited from Original Duesenberry and Davis Model that income ratchet effect and consumption ratchet effect terms significantly affect desired APC and accelerate APC, see Table 4.

Like Balochistan, the significant presences of income and consumption ratchet effects are the reasons to boost APC in KPK. While other models that include habit persistence effect are intended KPK's household to maintain balance between consumption and savings, see Table 4. The Pasha (2015) highlights the reason of high APC in KPK is the large inflow of remittances from foreign and domestic sources. According to Pasha (2015) remittances contribute about 20 % in

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[14] Interpretation is based on proposed line of Singh and Kumar (1971)

[15] For further detail see (Hafsa, 2017).

[16]Average yearly household income interval in Balochistan lie from twenty two nine hundred and ninety seven rupees (22,997) to thirty-one thousands nine hundred and sixty-nine rupees (Pakistan Bureau of Statistics, 2015-16).

KPK Households' income[17]. High APC also shows low households saving behaviour in KPK. According to IGC report "Pashtuns' are not savers"[18].

The trend of APC for Sindhi household is found to be opposite to Balochistan and KPK. The magnitude of APC for Sindh is less than other provinces' APCs. The Sindh's APCs ranges from 0.30 to 0.80 which shows relatively high saving attitude of Sindh's household as compared to other provinces. Cheema, Saleem, Rehman and Atif (2018) show that higher number of earners per households is the expected reason of high saving attitude in Sindh[19]. Moreover, APS is greater than APC even in DEF and Modified Davis Model for the province of Sindh. It may be concluded that the impact of habit ratchet effect to reduce APC in various RIH models is highest in case of Sindh, see Table 4.

Table 4: Estimated RIHs Models

	Duesenberry		Duesenberry-Eckstein-Formm			Davis		Modified Davis		
Province	$\hat{\alpha}$	$\hat{\beta}$	$\hat{\alpha}$	$\hat{\beta}$	$\hat{\gamma}$	$\hat{\alpha}$	$\hat{\beta}$	$\hat{\alpha}$	$\hat{\beta}$	$\hat{\gamma}$
Balochistan	0.9622*	0.0497*	0.50033*	0.0269	0.4789*	0.9600*	0.0509*	0.8738*	0.0584	0.5844*
	(0.0225)	(0.0213)	(0.1215)	(0.0179)	(0.1219)	(0.0222)	(0.0207)	(0.0373)	(0.0374)	(0.0037)
KPK	0.9548	0.0497*	0.4965	0.0269	0.4789*	0.9538	0.0509*	0.3618	0.0584	0.5844*
	(0.0069)	(0.0213)	(0.0063)	(0.0179)	(0.1219)	(0.0069)	(0.0207)	(0.0042)	(0.0374)	(0.0037)
Sindh	0.7967*	0.0497*	0.4160***	0.0269	0.4789*	0.8000*	0.0509*	0.2983*	0.0584	0.5844*
	(0.0481)	(0.0213)	(0.0508)	(0.0179)	(0.1219)	(0.0484)	(0.0207)	(0.0037)	(0.0374)	(0.0037)
Punjab	0.9468*	0.0497*	0.4192*	0.0269	0.4789*	0.8135*	0.0509*	0.3078*	0.0584	0.5844*
	(0.1295)	(0.0213)	(0.0226)	(0.0179)	(0.1219)	(0.0135)	(0.0207)	(0.0092)	(0.0374)	(0.0037)

Note: The *'** represent 1%, and 10% level of significance respectively and standard errors are presented in parenthesis

The Punjab's APC estimated from various forms of RIH is generally higher than that of Sind and lower than that of Balochistan and KPK. The results demonstrate that according to various versions of RIH models, average Punjabi household spends 31% to 94% of their income on consumption. The APS calculated for Punjab in present study is relatively lower than that estimated by Cheema, Saleem, Rehman and Atif (2018). It is demonstrated from Table 4 that the strength of habit ratchet effect in Punjab does same job like Sindh where average propensity to save is greater than average propensity to consume.

Original Duesenberry and Modified Davis Models for Punjab indicate low saving tendency. This trend could be justified by the findings of Cheema, Saleem,

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[17] According to Bureau of Emigration and Overseas Employment in 2019 KPK is known as "remittance led service economy" because the effect of remittance on KPK's Economic growth is 5%. From the year 1999 to 2015 twenty lac seventy five thousand six hundred and nine Pashtuns are working abroad.
[18] According to IGC report in 2015 migrants' family state that their 1st, 2nd and 3rd for the use of remittances are food, health and education respectively.
[19] HIES surveys form 2004-05 to 2015-16 shows that average no. of employed person's ranges from 1.88 to 2.15 i.e. more than other provinces

Rehman and Atif (2018) which states that the low savings in Punjab is the result of females' spendthrift behavior.

The estimated SRMPC and LRMPC for all provinces witness the smooth consumption behaviour. In order to smooth consumption path propensities to consume acts according to economic theory where SRMPC is lower than LRMPC. Which shows that all provinces make adjustments in long run to their consumption in response to income fluctuations but both propensities are closer to 1 that show smooth consumption path in short run as well in the long run.

Figure 2: Marginal Propensity to Consume over Short and Long run in Provinces
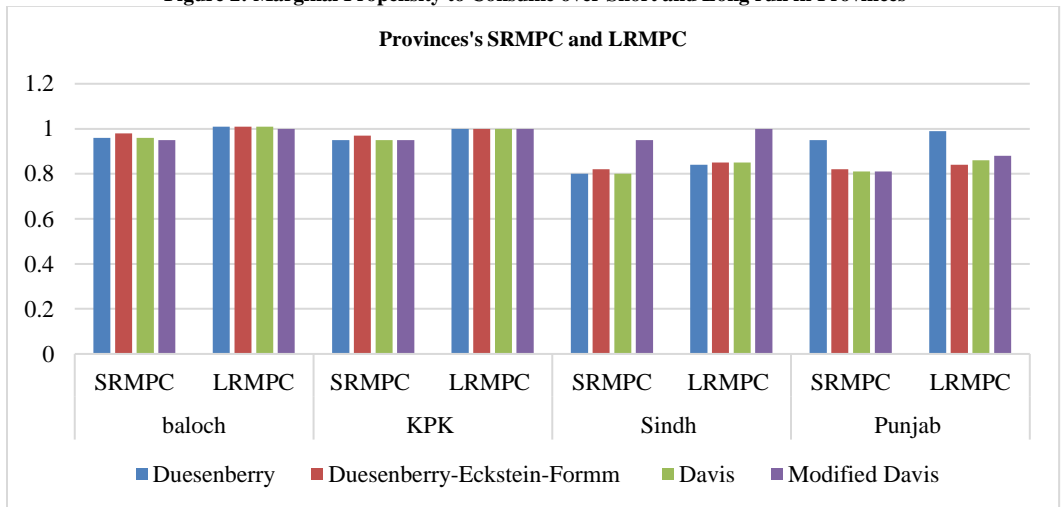
3.7 Diagnostic Tests

To test the Heteroscedasticity and Autocorrelation assumption in panel data, Liklihood-ratio test and Wooldridge test has been used. The findings of likelihood ratio test for various versions of RIH are depicted in Table 5.

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Table 5: Diagnostic Test Results for Panel Data

Model	likelihood-ratio	Wooldridge
$\left(\frac{C}{Y}\right)_t = \alpha + \beta\left(\frac{Y^0}{Y}\right)_t$	170.58*	5412.806*
$\left(\frac{C}{Y}\right)_t = \alpha' + \beta'\left(\frac{Y^0}{Y}\right)_t + \gamma'\left(\frac{C}{Y}\right)_{t-1}$	134.88*	2151.608*
$\left(\frac{C}{Y}\right)_t = \alpha + \beta\left(\frac{C^0}{Y}\right)_t$	163.76*	5715.366*
$\left(\frac{C}{Y}\right)_t = \alpha' + \beta'\left(\frac{C^0}{Y}\right)_t + \gamma'\left(\frac{C}{Y}\right)_{t-1}$	135.15	2373.803

Note: The * represents 1% level of significance.

The null hypothesis that error terms are homoscedastic at 1% level of significance is rejected for Original Duesenberry, DEF and Davis Consumption Model.

To test the autocorrelation assumption in various forms of RIH models, Wooldridge test is applied. The exhibited results in Table 5 rejects the null hypothesis of no first order serial correlation for Original Duesenberry, DEF and Davis Model.

However, last form of RIH model i.e. Modified Davis Model does not violate autocorrelation and heteroscedastic assumption. The RIH models that violate homoscedasticity and no autocorrelation assumptions are estimated by adjusted error structure of panel data for heteroscedasticity and autocorrelation.

4. Conclusion

There is a dire need to analyze consumption behavior in the formulation of appropriate macroeconomic policy for the scenario of developing countries like Pakistan by incorporating social aspects.

According to the findings of this study, Pakistan has all three types of ratchets effects. It is observed that in comparison with income and consumption ratchet effect, where stronger habit ratchet effect is found for all provinces and in all types of RIH models. These results provide reasoning for consumption behavior that cannot be reversed when income changes. In each estimated model at the provincial level the magnitude of ratchet effect is found to be the same for all provinces.

The analysis of APCs and MPCs exhibits the heterogeneous consumption behavior among four provinces. It is revealed that both marginal and average propensities to consume are highest in Balochistan followed respectively by Khyber Pakhtunkhwa, Punjab and Sindh. This phenomenon may be attributed to the earning differentials and societal factors in four provinces of Pakistan. The higher propensities to consume in relatively poor provinces verify the argument

made by Christen and Morgan (2005) that due to ratchet effect, financially weak households spend more on goods and services and save less. In this study, the LRMPC and SRMPC show smooth consumption patterns over time at the provincial level respectively.

The present study by thoroughly analyzing RIH at the provincial level finds one of the expected reasons that why Pakistani households do not step down their consumption when there is a reduction in their incomes. The results of this study explain that these households do not want to lose their maintained highest standard of living during their poor financial times.

According to the conclusion of present study the relative standing urges people to maintain and attain their highest standard of living. The findings of present study recommend to balance between their consumption and savings with the aid of suggestions i.e., Policy makers should opt appropriate tool of fiscal and monetary policy to equalize consumer behavior among various provinces' households. Marketers should not highlight perceived status benefits of their goods and services and maintain degree of equality among their customers. People usually work maximum hours to increase their standard of living that excess labour supply cause reduction in their wages. There should be labour market ceiling to minimize negative effects of over working and conspicuous consumption.

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