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Empirical Estimation of GDP determinants, Household Consumption Expenditure and the Consumption Multiplier in Pakistan (1985-2011)

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Abstract. Present study empirically estimates the impact of consumption on Gross Domestic Product in Pakistan using annual data for 27 years (1985-2011). Stepwise regression method is applied on GDP as dependent variable and several other variables like Household Consumption, Foreign Direct Investment, International Trade, Domestic Savings, Value Addition in Industry, Agriculture and Services Sectors taken independent of each other, External Debt, Remittances, Gross Capital Formation and Population as independent variables. The empirical results suggest that the change in GDP is significantly explained from the change in Agriculture and Services Sectors' Value Addition, Gross Domestic Savings, External Debt and Household Consumption. The Standardized Beta values of the coefficients of accepted variables suggest that the household final consumption expenditure is the biggest determinant of GDP out of the accepted variables. Further the consumption multiplier has been estimated from the estimated value of marginal propensity to consume (MPC) which suggests that rise of each Pakistani rupee (local currency) in household income leads to a rise of PKR 0.821 (Pak Rupee) in household final consumption. Further, given the MPC value, through induced expenditure, the multiplier effect is thus estimated at 5.587.
Keywords. Gross domestic product, Marginal propensity to consume, Consumption multiplier, Stepwise regression.
JEL. E2, E21, E210.

1. Introduction

According to the established notion of consumption-led growth in Gross Domestic Product (GDP) of any country, countries grow with additions in their Aggregate Demands. Household consumption makes biggest component of the Aggregate Demand. Present study is intended to empirically estimate and identify the most important factors affecting the GDP of Pakistan. This is done through applying stepwise regression method to run the linear regression on GDP as dependent variable and the several other variables like Household Consumption Expenditure, Foreign Direct Investment, International

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Trade (Exports and Imports), Domestic Savings, Value Addition in Industry, Agriculture and Services Sectors taken independent of each other, External Debt, Remittances, Gross Capital Formation and Population as the independent variables. Though the empirical results suggest that the change in GDP is significantly explained from the change in Agriculture and Services Sectors' Value Addition, Gross Domestic Savings, External Debt along with the Household Consumption, nevertheless, the most dominant factor affecting GDP of Pakistan is the final household consumption expenditure. The second most important factor significantly affecting the change in GDP is the Value Added Services.

In addition, the consumption patterns of the selected developing countries given in Table 1 calculated as percentage of GDP reflects the significance of the consumption expenditure as the biggest component of GDP justifies the worth of the study. None among the selected countries, Bangladesh, Malawi, Nepal, Philippines, Turkey, Sri Lanka, India and Pakistan has observed consumption expenditure as percentage of GDP below 60% during 27 years (1985-2011). According to Table 1, the percentage share of final household consumption taken as average of 27 years (1985-2011) is more than 70% for most of the selected developing countries except India that has 63% share of household consumption expenditure in its GDP. This confirms the basic idea as the household final consumption expenditure dominates the GDP equation. Seemingly the Indian economic structural base has been diversified due to its spectacular growth in services and manufacturing sectors in last two decades. Therefore the share of GDP has been tilted more towards manufacturing (Eichengreen, Barry and Gupta, Poonam, 2011) and services.

Despite the skeptic views (Panagariya, 2008) about the sustainability of the services sector in India, the share of services sector has seemingly converged to the international norm. The prominent sectors include business services, communication and banking along with IT sector.

TABLE 1:*Percentage Share of Consumption in the GDP of Selected Countries 1984-2013*

	Bangladesh	Malawi	Nepal	Philippines	Turkey	Sri Lanka	India
				Percentage of GDP			
1985	87.00	69.00	77.00	76.00	79.00	77.91	67.00
1986	86.00	70.00	79.00	73.00	76.00	77.65	66.00
1987	87.00	66.00	79.00	74.00	69.00	77.24	66.00
1988	86.00	72.00	80.00	71.00	66.00	78.14	65.00
1989	86.00	75.00	80.00	71.00	69.00	77.29	65.00
1990	86.00	72.00	84.00	72.00	69.00	75.92	65.00
1991	85.00	74.00	82.00	73.00	68.00	77.41	66.00
1992	83.00	85.00	81.00	74.00	67.00	75.35	65.00
1993	82.00	88.00	79.00	74.00	66.00	74.82	67.00
1994	82.00	71.00	82.00	71.00	66.00	75.11	66.00
1995	83.00	79.00	75.00	74.00	68.00	73.24	64.00
1996	83.00	83.00	76.00	73.00	70.00	74.13	68.00
1997	81.00	83.00	77.00	72.00	68.00	72.32	65.00
1998	79.00	77.00	77.00	72.00	66.00	71.07	66.00
1999	79.00	87.00	77.00	73.00	68.00	71.47	62.00
2000	78.00	82.00	76.00	72.00	71.00	72.05	64.00
2001	79.00	80.00	80.00	74.00	68.00	73.97	63.00

2002	77.00	84.00	82.00	74.00	71.00	71.27	64.00
2003	77.00	84.00	83.00	74.00	71.00	71.85	63.00
2004	76.00	88.00	80.00	75.00	71.00	70.94	58.00
2005	76.00	91.00	80.00	75.00	72.00	69.01	58.00
2006	76.00	84.00	82.00	75.00	71.00	67.66	57.00
2007	77.00	72.00	81.00	73.00	71.00	67.15	56.00
2008	79.00	79.00	80.00	74.00	70.00	69.95	59.00
2009	77.00	69.00	80.00	75.00	71.00	64.45	57.00
2010	77.00	71.00	79.00	72.00	72.00	65.16	56.00
2011	78.00	75.00	76.00	73.00	71.00	69.82	59.00
Average	80.81	78.15	79.41	73.30	69.81	72.68	62.85

Explanations: The table shows the data on the year-wise percentage share of consumption in GDP of the countries selected for the study. Last row gives the average of the 27 years (1985-2011). All selected countries assume more than 60% share of consumption in GDP in all years. The data has been taken from World Bank online dataset.

Keeping in view the importance of the household consumption for GDP growth, an attempt is made to investigate the dynamics of household consumption expenditure vis-à-vis that of the economy's growth. Though the causal relationship between GDP and Household Consumption is established in the regression, however it does not help in capturing the other dynamics of the systematic link between the Household Consumption Expenditure and GDP. The dynamics of this relationship require knowing the size by which the household consumption is affecting the GDP or the value of consumption elasticity of household towards the household income. Therefore, to proceed on the study in depth, the marginal propensity to consume as a measure of household consumption expenditure elasticity is estimated on the yearly data on Household Income and the Household Consumption after applying transformation on the original data to the natural log form.

Notwithstanding, the data in hand suggests only the average and annual percentage share of consumption and not the causal linkage between consumption and GDP. Neither the sheer data confirms the claims that household consumption expenditure is the biggest factor affecting GDP nor consumption expenditure may be proved as the dominant determinant of GDP in presence of other factors like Foreign Direct Investment, Trade, domestic savings, value addition in Industry, Agriculture and Services sectors taken separately, external debt, remittances, gross capital formation and population as independent variables.

Therefore to establish the empirical relationship, stepwise regression has been run on the selected dependent and independent variables to find out the factors which affect GDP in a statistically significant and systematic way. Once the investigation on the empirical relationship is done, it is important to check the influence of change in consumption expenditure on the national income (GDP) using consumption multiplier effect via estimating marginal propensity to consume.

Following paragraphs present the chronology of the sections included in the paper. Second Section of the study presents elaboration of the consumption function, marginal propensity to consume and the multiplier effects in an economy.

Third section deals with the study of relevant literature in the context of Pakistan as well as the other developing countries.

Fourth section takes a detailed account of the research technique, regression estimations and their interpretation under taken in the paper. Final section is left for concluding remarks along with the limitations of the study and its future scope.

2. GDP, Consumption Function, Marginal Propensity to Consume and the Multiplier Effect

Consumption function is a mathematical relationship between household income and the final household consumption expenditure. Some studies have also attempted to investigate the effects of wealth and current disposable income on consumption expenditure like (Ando, A.; & Modigliani, F., 1963) introduced the Lifecycle Hypothesis to reconcile the low short-run marginal propensity to consume from income with the relative stability of the average propensity, as it was the well-known theory of "permanent income" due to (Friedman, 1957) and (Duesenberry, 1949). However, the present study measures the size of consumption multiplier from the annual household disposable income in Pakistan.

Further, Gross Domestic Product is defined as the value of total number of goods and services produced inside a country in a given period of time. This relationship can be shown through following mathematical equation:

$$\mathrm{GDP} = \mathrm{C} + \mathrm{I} + \mathrm{G} + NX \quad (1)$$

Where C = Consumption
I = Investment
G = Government Spending
NX = Net Exports (Exports – Imports)

Here consumption is the sum of expenditures by households on all goods (durable goods, nondurable goods) and services. Investment is the sum total of all private expenditures on capital equipment, tools, inventories, and structures. Government expenditure is the sum total of expenditures on purchases of goods and services by public sector. Net export is the difference between are the earnings from exports minus payment for imports.

Further, to estimate multiplier effect of consumption on GDP, marginal propensity to consume is measured from consumption function using following consumption function and MPC equation:

$$\mathbf{C} = \bar{\mathbf{C}} + \mathbf{cY} \quad (2)$$

The above equation II is the consumption function. $\bar{\mathrm{C}}$ is the autonomous consumption that's the amount of consumption under taken by households and institutions independent of the disposable income in the economy. Small c is the fraction or proportion of any change in income that is consumed as a result of rise in income. Since the Marginal Propensity to Consume (MPC) is the rate of change in consumption due to the one unit change in the income therefore it is known as the slope of the Consumption Function [i.e. MPC = change in consumption/change in income.]. Y denotes the disposable income in the economy. The slope of Consumption Function or MPC is estimated as follows:

$$\frac{\partial \mathbf{C}}{\partial \mathbf{Y}} = \frac{\bar{\mathbf{C}}}{\partial \mathbf{Y}} + \frac{\partial \mathbf{Y}}{\partial \mathbf{Y}}\mathbf{c} \quad (3)$$

First term on the right hand side in equation III turns zero on account of $\overline{C}$ being constant, $\frac{\overline{C}}{\partial Y} = 0$, the second term $\frac{\partial Y}{\partial Y} c$ retains the value of small c [i.e. the slope of consumption function (MPC)].

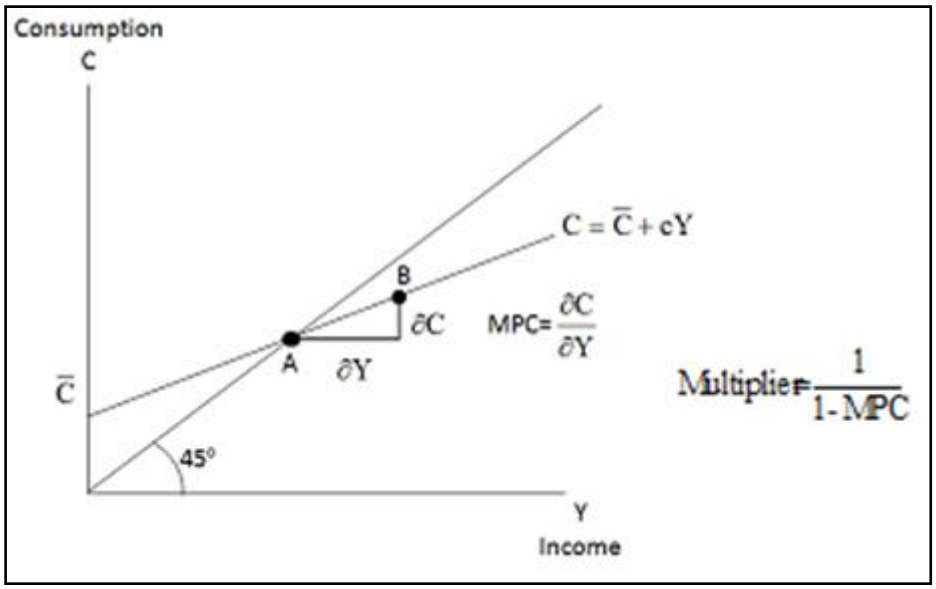
$$\frac{\partial C}{\partial Y} = MPC = c \tag{4}$$

Further, the multiplier value out of the slope of the consumption function is calculated by plugging in the value of MPC, small c, into following equation:

$$Multiplier = \frac{1}{1 - MPC} \tag{5}$$

The size of multiplier calculated from equation V estimates the changes in the GDP as the consumption changes by one unit. The specifications of the model have been taken from (Dornbusch, R. & Fischer, S., 2013)

Graphical representation of consumption function, MPC and Multiplier is given as under:



GRAPH 1 *Consumption Function, Marginal Propensity to Consume and Multiplier*

Graph 1 depicts the functioning of consumption function and its interlink with MPC and multiplier. The economy starts at an initial point of A on a consumption function $C = \overline{C} + cY$ with size of MPC, given as $\frac{\partial C}{\partial Y} = MPC = c$. It can be seen from the graph that the change in national income is far larger than the change in consumption expenditure. The volume by which the national income in an economy changes as a result of the change in induced consumption depends upon the size of the MPC. The value of MPC ranges between 0 and 1 (in percent from 0 to 100%). MPC taking zero value means, the rise in consumption is zero when income of the consumers is changing by 1 unit. On the other hand, MPC assuming value of 1 means that the rise in income is 100% consumed by the households. In the real world, both 0 and 1 values of MPC cease to exist. The change in GDP

(Income) due to the change in consumption expenditure by the households depends upon the size of the multiplier which in turn depends upon the value of MPC. After identification of Household Final Consumption Expenditure as the most important factor affecting the GDP, the objective is to estimate the MPC and the multiplier size in case of Pakistan. Higher the size of multiplier, larger would be the change in GDP which is a desirable phenomenon for economic growth of the country.

3. Literature Review

Based on the Keynesian hypothesis, the definition of consumption function has evolved from several studies and well known theories like (Duesenberry, 1949), (Brown, 1952), (Friedman, 1957) and (Ando, A.; & Modigliani, F., 1963). Further, (Carroll, 2001) has made these theories as part of the bigger discussion about the optimal behaviour of consumption with labour income uncertainty. According to him the consumption pattern is much better described by Friedman's original statement of the permanent income hypothesis.

On the other hand, Gross Domestic Production is the monetary value of the goods and services produced in a country in a given year. Additionally, till now GDP is considered as the most consistent and technically reliable measure of economic growth of a country, despite of some of its short comings if it is used as a measure of economic well being[i]. (Kuznets, 1962). Further, the GDP growth is an indicator of economic growth as accepted across the board as (Böhnke, 2003) narrates the empirically tested fact that lower gross domestic product (GDP) per capita in a given period of time leads to lower satisfaction levels throughout the population. Several studies like (Inglehart, R. and Klingemann, H.-D., 2000); (Ryan, M. R.; and Deci, A. L., 2001); (Di Tella, MacCulloch, & Oswald, 2003); (Fahey, T. and Smyth, E., 2004) have concluded their notion that economic growth and rising prosperity, in the long run, does not ensure the existence of increasing satisfaction and happiness levels; on the contrary, in most cases the subjective well-being remains remarkably constant.

Since the study is an attempt to identify the most important components of GDP and establish a significant causal link between household consumption expenditure and GDP in Pakistan, the available literature is presented here in two parts. First part includes the scientific studies on the causal link between the two variables in the context of Pakistan while second stack of scientific studies comprises of the studies on other developing countries.

(Khan, 2010) has pleaded the notion that GDP growth in developing countries including Pakistan has been consumption-led as the weight of consumption as a major component of GDP makes up approximately 70% of total GDP. Further, it is argued for sustaining long term economic growth the investment is bound to rise at a higher rate than the consumption. Further, in case of China, the economic strategy has been changed from export-led growth to the strategy of expanding domestic consumption for growth purposes.[ii]

In addition, (Islam, M.K. and Hossain, M.D, 2015) investigated the statistical relationship between domestic demand using household consumption expenditure and government consumption. Co-integration and error-correction mechanism techniques were used on annual data from (41 years) 1971-2011. The study investigated the causal relationship between domestic demand, export and economic growth using data pertaining to Bangladesh's final household consumption and government consumption as a measure of domestic demand, real exports, and real GDP over the period 1971–2011. The study concluded that final household consumption, final government consumption and export have influence on economic growth both in short-run and long-run.

In addition, (Mehmood, 2012) investigated the impact of twelve selected factors [such as gross national expenditure, final consumption expenditure, goods exports & imports, services exports & imports, external debt stocks, gross saving, FDI inflows, FDI outflows, gross domestic income, net income from abroad and worker's remittances and compensation of employees paid] on GDP in case of Pakistan and Bangladesh over the period of 34 years from 1976-77 to 2008-09. (Mehmood, 2012) concludes with a result that in case of Pakistan Gross National Expenditures, Goods Exports, Gross Saving and Final Consumption Expenditure have a positive effect on the GDP. Also in case of Bangladesh, the Final Consumption Expenditure has a positive and significant impact on GDP of both countries.

Further, following studies have been analysed and used as a precursor for evidence of the link between domestic demand/household final consumption expenditure in the context of South East Asian Countries. First study is (Wah, 2010). Wah using co integration analysis on time series data pertaining the periods over 1961-2000 found short run bilateral causality among export, domestic demand and economic growth in case of Malaysia. The study implied that at least in short run domestic demand-led growth and export-led growth is valid. Secondly, (Wong, 2008) examined the causal link of exports and domestic demand to economic growth in Indonesia, Malaysia, the Philippines, Singapore and Thailand using Granger causality test. The study showed the presence of bidirectional causality between exports and economic growth and between private consumption and economic growth. However it was less conclusive between investment and economic growth, and government consumption and economic growth. Another study, (Tsen, 2007) has investigated the same relationship in the context of seven Middle Eastern countries namely Bahrain, Iran, Oman, Qatar, Saudi Arabia, Syria and Jordan. The results verified the presence of two way causality between export, domestic consumption and investment as independent variables and economic growth and vice versa.

As per the (Rabobank, 2010)[iii], private consumption growth supported by increasing households' incomes as well as the stable remittances inflows is one of the main growth drivers.

The chapter on literature review may be concluded in a way that most of the selected studies have used co integration and Granger Causality techniques to find out the causal relationship of domestic consumption or final household consumption expenditure on economic growth in presence of exports or not. They have found that there is at least in short run proven estimated impact of final household expenditure on economic growth. Further, some studies have also shown the significant influence of domestic demand on long run economic growth of countries. In case of Malaysia, export-led growth strategies are equivalently accepted as the domestic consumption-led growth strategies for the short run pursuits of the economic growth.

4. Regression Estimations and Interpretation

Stepwise regression method is applied on the dependent Variable, GDP, and the eleven independent variables of Household Consumption Expenditure, Foreign Direct Investment, International Trade, Domestic Savings, Value Addition in Industry, Agriculture and Services Sectors taken independent of each other, External Debt, Remittances, Gross Capital Formation and Population. Five out of 12 independent variables included in the stepwise regression equation have shown significant impact on the GDP of Pakistan. The regression exercise has retrieved insignificant statistical relationship of the remaining six independent variables with

the dependent variable GDP. As per the estimates of standardized coefficients (Beta) of the five independent variables, the estimate of the Final Household Consumption Expenditure has retained the highest value followed by the value addition in services sector. Therefore, the analytical part of the study focuses more on the dynamics of the most dominant factor in the model, i.e. the Final Household Consumption Expenditure and GDP.

The summary of retained and excluded independent variables is given in following tables:

TABLE 2 *Stepwise Regression (Backward Selection) Retained Predictors*

	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sign.
	B	**Std. Error**	**Beta**		
(Constant)	826.41	444.506		1.859	0.077
Serv_VALUE_ADDED_MUS$	0.45	0.074	0.247	6.075	0
Agri_Value_added_MUS$	300	0.086	0.069	3.484	0.002
Gross_Domestic_Sav_MUS$	0.83	0.039	0.085	21.102	0
Ext_Debt_MUS$	0.323	0.048	0.013	6.675	0
HH_Cons_MUS$	0.741	0.64	0.609	11.616	0

Notes: Five variables namely Services Value added, Agriculture Value Added, Gross Domestic Savings, Undisbursed External Debt, Household Final Consumption Expenditure as independent variables have been found having significant impact on GDP of Pakistan (significance p-value less than 5% except constant). Further, Household Consumption expenditure has assumed highest Beta value indicating the most important determinant of GDP.

Table 2 presents the summary of the retained predictors statistically explaining the variation in GDP. Here five out of eleven independent variables have been found affecting GDP statistically significantly. These variables are Services Value added (Serv_VALUE_ADDED_MUS$), Agriculture Value Added (Agri_Value_added_MUS$), Gross Domestic Savings (Gross_Domestic_Sav_MUS$), Undisbursed External Debt (Ext_Debt_MUS$), Household Final Consumption Expenditure (HH_Cons_MUS$). It can be seen from the standardized beta values given in the above Table 2, the beta standardized coefficient associated with the household final consumption expenditure has assumed the highest value of 0.609. It confirms that the household final consumption expenditure, given all other significantly affecting variables in the present model, is the most important factor. Then the services value added sector follows with the value of 0.247.

The regression equation including the accepted independent variables (in Table 2) is given as follows:

$$GDP = \alpha_0 + \alpha_1 SER + \alpha_2 AGRI + \alpha_3 GrDomS + \alpha_4 Ext\_Debt + \alpha_5 1HHFinConExp \quad (6)$$

$$GDP = \underset{0.077}{826.41} + \underset{0.000}{0.45} SER + \underset{0.002}{0.3} AGRI + \underset{0.000}{0.83} GrDomS + \underset{0.000}{0.323} Ext\_Debt + \underset{0.000}{0.741} HHFinConExp$$

$$F = 62659.913 (0.000) \quad (7)$$

The model is strong reflected from the fact that the F-statistics has retained substantially large value and significant at p-value less than 0.05. In addition all estimates have t-values that are significant at p-value <0.05 except the constant. The value of the constant accumulates the residual change out of the total change

not explained by the independent variables in the model. Equation VI presents the statistical relationship between GDP and the accepted independent variables after running stepwise regression. Equation VII presents the estimated coefficients with associated probability values of t-statistics given in the parentheses below each estimated coefficient. The p values associated with each coefficient are less than 0.05 indicating the power of generalizability and thus the statistical significance. The summary of the stepwise regression results exhibiting the excluded variables is specified in the following Table 3.

TABLE 3: *Stepwise Regression (Backward Selection) Excluded Predictors*

Excluded Variables	Coefficients		t-stat.	Sig.
	Unstandardized	Standardized Beta		
Tax_Revenue_MUS$	-0.009	-0.001	-0.076	0.94
Gross Fixed- Capital form: MUS$	-0.057	-0.009	-0.299	0.769
Per_Remittance_MUS$	-0.1	-0.006	-0.551	0.589
Industry_Value_Added_MUS$	0.172	0.035	0.944	0.358
Population Million	-19.908	-0.01	-1.202	0.245
Exports_MUS$	0.119	0.014	1.594	0.128
FDI- MUS$	0.179	0.005	1.317	0.203

Notes: Seven out of 12 selected independent variables have been excluded on account of assuming p-values more than the acceptance level of 5%. These p-values are given in the last column under Sig. Insignificant estimates lose the power of generalizability therefore are excluded.

Table 3 summarizes the results of stepwise regression regarding the excluded variables on the basis of statistically insignificant estimates because the values of p in case of all estimates are more than the accepted value of 0.05.

The statistically insignificant estimates of Tax revenue, Gross Fixed Capital Formation, Personal Remittances, value addition in industry, population, Exports and FDI during the study may be the result of certain noneconomic issues in the economy during the study period. Brief case to case discussion on the excluded variables due to insignificant estimates is provided in the following paragraphs.

For tax revenue it may be assumed that the taxation structure in the economy of Pakistan have not been devised on the lines when the productive efficiency is boosted. The case of tax avoidance, evasion and disproportionate burden of tax away from rich and elite class has been functioning under cover to undermine the impact of tax revenues on GDP.

Further, the gross fixed formation of capital has retrieved the insignificant result. This may be because Pakistan economy is dominantly agriculture based and the capital formation in agriculture sector is non-monetary and may not be reflecting any statistical significant relationship with GDP. In case of personal remittances, the amounts of money sent by Pakistani expatriates are already part of the household expenditure so may be significantly affect the GDP of the country. In presence of household final consumption expenditure, the impact of other factors included in the study is suppressed as GDP is determined most dominantly by the household expenditure.

Further, Consumption function has been estimated to the tune of equation II [$C = \bar{C} + cY$] to find out the value of MPC. Following Table 4 summarizes the regression results:

TABLE 4. *Summary of Consumption Function Estimate*

	Unstandardized Coefficients		Standardized Coefficients			R^2
	B	Std. Error	Beta	t	F-Statistics	
Constant	-4484.048	751.204		-5.97 (0.00)	11401.455 (0.000)	0.98
GDP_MUS$	0.821	0.008	0.99	106.78 (0.00)		

Notes: Consumption function estimates show significant, strong and positive relationship between GDP and consumption expenditure. P-values (in braces) associated with constant and GDP variable in column 5 (under t) are <5% or 0.05 so the estimates have high generalizability power and confirm the consumption theory.

The slope of the consumption function is the rate of change in consumption due to the change in income by one unit. If the equations III and IV are followed carefully, it is clear that Marginal Propensity to Consume (MPC) is the slope of the consumption function that is the small c in equation IV. Table 4 above presents the summary of the regression results of the consumption function estimation. Substantially large and significant value of F-Statistics reflects that the model is strong and reliable. Further, p value associated with each coefficient's t-value is zero suggesting that the results are systematic and not by chance. In addition, the generalizability power of the model is also reflected from the zero p-values of t-statistics associated with independent variable and the constant. Large value of R^2 is evidence of high explanatory power of the independent variable towards the change in the dependent variable. The value of constant carries negative sign which is of not much concern in the present case. As the raw data is used, the intercept is rather meaningless extrapolation – the amount of consumption when income is zero- It would be extrapolating beyond the observed data on consumption and income (GDP) so the negative value of constant carries no relevant information here.

Proceeding further on the analysis, the equation V $\text{Multiplier} = \frac{1}{1-\text{MPC}}$ is used to calculate the value of multiplier using the information in Table 4 given above on the estimated coefficient of the GDP.

After plugging in the value of MPC (estimated value of the coefficient=0.821) in the multiplier equation we can find the size of multiplier.

$$\text{Multiplier} = \frac{1}{1-\text{MPC}} = \frac{1}{1-0.821} = 5.587$$

The size of multiplier calculated in the above equation is too large which confirms the key hypothesis in the present study that the household consumption expenditure is the key determinant of the GDP in Pakistan. Further, the Pakistani economic growth pattern is the consumer driven. Following Table 5 presents the summary of the estimated values of household consumption expenditure and the GDP.

TABLE 5. *Estimated Consumption in Million US $ and the Estimated change in GDP with Multiplier Effect*

Estimated Consumption Function $\hat{C} = -4484.05 + 0.821\hat{Y}$

	Constant	Slope		Multiplier
	-4484.05	0.821		5.587
	GDP (US $ M)	Actual Household Final Consumption Expenditure (US $ M)	Estimated Household Final Consumption Expenditure (US $ M)	Change in GDP with the Estimated Multiplier Effect (US $ M)
1985	31144.92	25530.02	21085.93	117807.09
1986	31899.07	25273.64	21705.09	121266.33
1987	33351.53	25047.00	22897.55	127928.63
1988	38472.74	28685.04	27102.07	151419.27
1989	40171.02	28990.42	28496.36	159209.15
1990	40010.43	29511.99	28364.51	158472.52
1991	45451.96	31005.67	32832.01	183432.44
1992	48635.24	34056.62	35445.48	198033.92
1993	51478.36	37173.68	37779.68	211075.07
1994	51894.8	36898.37	38121.58	212985.25
1995	60636.07	43914.93	45298.17	253080.85
1996	63320.17	46149.11	47501.81	265392.61
1997	62433.34	46747.33	46773.72	261324.79
1998	62191.96	44819.78	46575.55	260217.57
1999	62973.86	47663.60	47217.49	263804.09
2000	73952.38	55743.32	56230.85	314161.76
2001	72309.74	55154.47	54882.25	306627.11
2002	72306.82	54073.73	54879.85	306613.72
2003	83244.8	61481.36	63859.93	356785.44
2004	97977.77	72689.20	75955.70	424364.47
2005	109502.1	84260.47	85417.18	477225.77
2006	137264.1	106579.41	108209.74	604567.84
2007	152385.7	118708.68	120624.62	673929.77
2008	170077.8	139249.58	135149.86	755082.25
2009	168152.8	133197.18	133569.38	746252.12
2010	177406.9	141420.95	141166.98	788699.91
2011	213853.9	173558.97	171089.97	955879.68
Average		**63984.61**	**64008.64**	**357616.27**

Notes: Estimated values multiplier and the slope confirm with the consumption theory. Last two columns show the estimated household consumption expenditure and the estimated change in the GDP with multiplied effect in million US dollars. Last row shows the average values of Actual and estimated household consumption expenditure and the estimated change in the GDP value in million US dollars.

The above Table 5 presents the estimated value of annual household consumption final expenditure in million US $ and the estimated change in GDP with the multiplier effect. The average estimated household final consumption expenditure is US $ 64008.64 million, given in the last row of Table 5. This value

has been calculated by plugging in the value of GDP ($\hat{Y}$) in the estimated equation of consumption function provided in the first row of Table 5. In the right column on the right side, the multiplier effect is included in the estimated household final consumption expenditure to see the estimated change in GDP resulting from the estimated change in the household final consumption expenditure in million US dollars. The value of estimated change in GDP in million US dollars as a result of estimated average change in final household consumption expenditure of US $ 64008.64m has been estimated to the tune of US $ 357616.27m. This change is exactly equal to the estimated multiplier size.

5. Summary and Conclusion

Present study has been conducted using annual time series data on eleven selected factors that were seemingly affecting the GDP in a developing country setting like Pakistan. Stepwise regression method is applied on the regression equation using GDP as the dependent variable and several other variables like Household Consumption, Foreign Direct Investment, International Trade, Domestic Savings, Value Addition in Industry, Agriculture and Services Sectors taken independent of each other, External Debt, Remittances, Gross Capital Formation and Population as independent variables. The regression results retrieved show five variables having the statistically significant estimates namely: Five factors Out of eleven independent variables, Agriculture and Services Sectors' Value Addition, Gross Domestic Savings, External Debt and the household final consumption expenditure. After comparing the standardized beta values it is found that the household final consumption expenditure assumes the highest value among other variables followed by the value addition in services sector. On account of the stepwise regression results, the data on final household consumption expenditure and GDP (as indicator of national income) is used in estimating the marginal propensity to consume (MPC) from consumption function elaborated in chapter 2. The estimated value of MPC is 0.821. The same value is plugged in to the multiplier equation to estimate the size of consumption multiplier. Hence the estimated value of consumption multiplier is 5.587. Further the estimated value of marginal propensity to consume is used to find out the value of estimated household final consumption expenditure for the given time period (1985-2011). The average estimated household final consumption expenditure is valued to US $ 64008.64 m. further the estimated change in GDP due to the given change in household final consumption expenditure, with the multiplier effect has been averaged to of US $ 357616.27m. The size of multiplier of 5.587 and the value of MPC of 0.821 confirms that the growth of a developing economy of Pakistan dominantly takes stimulus from the household consumption patterns. Therefore if the consumption patterns by the household are synchronized with the growth in the local and foreign investment rate would lead to high rates of economic growth. Despite of some of the limitations of the multiplier and MPC, the previous relevant literature on the topic has endorsed the idea that consumption-led growth strategies have been somehow fruitful vis-à-vis that of the export-led growth strategies.

6. Limitations

The present study has been using official time series annual data from reliable sources of World Bank Online database. Further, the research methodology and the theoretical framework have been supported with the theory of consumption function. In addition, the statistical estimations obtained through stepwise regression and OLS enter method regressions have been significant and reliable.

Nevertheless some of the limitations of the concept of consumption multiplier when applied in the developing country setting are found during the study. These limitations are being presented here.

1. The higher value of MPC leads to the larger size of multiplier. This suggests that the less developed countries with higher marginal propensities to consume are ought to grow at far higher rates than that of the developed world. This notion does not exist when the GDP growth rates among developing countries are compared with that of the developed world except in case of few South East Asian Countries of China, South Korea, and Malaysia etc.
2. Further, the working of MPC assumes that the households are consuming some percentage of the increased income on consumption expenditure. This assumption may not hold in case people may spend part of whole of the increment on other more compelling or promising heads like: savings, debt payments, purchase of the stocks etc. Further, given the inflation rates, the rise in income may be offset with higher level of general prices. Known as the leakages in the consumption flow, these activities may lead to the under sized multiplier value.
3. For assumption of rise in consumption as percentage of the rise in income holds the assumption that the supply of goods and services rises as the demand rises. But this may not hold in case of shortages. Hence, whatever the size of MPC, the value of multiplier may not rise as the increase in consumption expenditure in this case would generate higher rates of inflation.
4. In addition, the theory of consumption multiplier may not hold in case of the full employment as the supply of goods and services may not be increased beyond economy's full employment level.

Scope for Future Study

Present study has been conducted using data on eleven factors and on GDP to find out the most important factors affecting the changes in GDP. Household final consumption expenditure and value addition in services sector have been identified as the two most important and dominant factors leading to change the GDP significantly. Then consumption multiplier is estimated using estimated MPC value through OLS regression method. Keeping in view the limitations of the consumption multiplier, investment and other factors may be taken to estimate the size of multiplier. Further, the export-led and consumption-led growth strategies may be compared to estimate the right policy options for the GDP growth in developing countries. It may also be important to identify the consumer goods and the pattern of household consumption so that the clear idea on the consumption expenditure may be developed.

Notes

[i] It ignores the quality of life, underestimates informal markets, and overestimates negative externalities

[ii] Central Economic Work Conference Convenes in Beijing December 3 to 5," People's Daily, December 6, 2004, 1, www.people.com.cn (accessed July 21, 2006)

[iii] Netherlands-based international financial services provider with activities in banking, asset management, leasing, insurance and real estate

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