*Corresponding author: Ameet Kumar, Business, Sukkur IBA University, Sukkur, Sindh, Pakistan
E-mail: ammeet.kumar@iba-suk.edu.pk

GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE

Impact of external debt and exchange rate volatility on domestic consumption. New evidence from Pakistan

Ameet Kumar[1]*, Niaz Ahmed Bhutto[1], Khalid Ahmed Mangrio[1] and Muhammad Ramzan Kalhoro[1]

Abstract: This study has examined the impact of external debt and the volatility of exchange rate on domestic consumption in Pakistan by using the yearly data (1980–2014). We apply the bounds testing approach to cointegration and error-correction modeling to check their short run and long-run impact on the domestic consumption. The findings of this study has contributed to the existing literature in two ways: bound test results show that income, interest rate, exchange rate, volatility of exchange rate, and external debt have long-term relationship with domestic consumption and income, interest rate and exchange rate have positive impact whereas exchange rate volatility and external debt have negative impact on domestic consumption in the short run as well as in long run. Moreover, the coefficient of ECM_{t-1} is significantly negative and it shows that adjustment toward equilibrium from short run to long run takes more than half a year. Consumption is the major component of GDP so policymakers use its determinants to fine-tune the economy. This study proposes that policymakers should consider external debt and exchange rate volatility in devising the monetary policy of Pakistan.

ABOUT THE AUTHOR

Mr. Ameet Kumaris Lecturer at Sukkur IBA University and also enrolled as M. Phil student at Sukkur IBA University. He has more than five years of experience in teaching and banking. His research interest mainly includes financial economics and international economics. Prof. Dr. Niaz Ahmed Bhutto is head of department at Sukkur IBA University. He has more than four years of experience in supervising PhD and Master Students. His research interest especially includes international economics, development economics, and macroeconomics. Dr. Khalid Ahmed is currently working as Associate Professor of Economics at Sukkur IBA University. He has series of publications in top-ranked international journals. His research interest especially includes energy economics, environmental economics, and international economics. Muhammad Ramzan Kalhoro is Assistant Manager Research at Sukkur IBA University. His research interest includes international finance, macroeconomics, and financial markets.

Ameet Kumar

PUBLIC INTEREST STATEMENT

Household consumption constitutes the major portion of overall spending of every country, so policymakers consider its determinants in fine-tuning the economy. Rapidly increasing inter-countries trade and widely spreading global financial crises incite to consider the external factors like exchange rate volatility and external debt as the determinants of consumption. Many emerging countries like Pakistan are facing stagnant economic growth due to excessive external debt, instability in exchange rate and other macroeconomic and financial issues, this study may help in devising the policies where proper attention to prominent factors of consumption may help in boosting the economy. Findings posit that excessive external debt and exchange rate volatility negatively affect the consumption hampering economic growth. Decreasing the external debt level, increasing the checks to assure the efficient use of external debt and increasing the net export level of a country may solve the discussed issue.

1. Introduction

Among the four-expenditure based GDP approach components, consumption is the largest and most stable factor. Almost in every economy of the world, a substantial portion of the production is consumed by the domestic inhabitants. That is why the economists and policymakers pay attention toward the determinants of the consumption in order to use them in policy tools to accelerate the economy during recessionary period and to shorten it during inflationary period. Literature has proved that interest rate and income are two major determinants of the domestic consumption, where disposable income is the contribution of Keynesians in the consumption function, while the interest rate is of Classicalists. The relationship between income and consumption was also analyzed through two main hypotheses, permanent income by Friedman versus Modigliani's life-cycle hypothesis in the past literature. According to Blinder, Deaton, Hall, and Hubbard (1985), there is no substantial dissimilarity between the two hypotheses. And the major contribution of researchers is only the identification of the suitable econometric approach to estimate the traditional functions. The process of Different categories of modern approaches started with The Lucas critique by (Blinder et al., 1985), which supports the estimation method that treats consumption and income jointly, while "'random walk'" hypothesis was supported by Robert Hall, where he stated that consumption could only be affected by substantial changes or surprises in the permanent income. Robert Barro stated in his Barro Equivalence hypothesis that if people can freely transfer income across generations, intertemporal shifts in the pattern of taxes could change time patterns of consumption; and in the last, advantages and disadvantages of the interest rate in the domestic consumption function were stated in Intertemporal Substitution.

In the previous literature interest and income were considered to be the major determinants of the consumption. Besides, some studies also included the inflation rate in the consumption function. By including the interest rate, inflation rate and income as explanatory variables, Kugler (1985) tried to evaluate its impact on consumption of nondurables in UK, Germany, France, and USA. Additionally, inflation uncertainty was also included in the consumption function by Villagómez (1994) to check it is the impact on consumption in the less developed countries (LDC). He applied two methods of the estimation (OLS vs. IV procedure), but result in both tools was the same that the impact of interest rate is stronger in low inflation countries compare with countries with high inflation. While inflation and inflation uncertainty are the most important determinants for the saving and consumption decisions in high inflation economy.

Because every economy of the world tends to have open door policy for the trade in order get perks of international trade, hence the exchange rate has become a key player, which directly affects the trade flows of the different economies as well as other macroeconomic variables i.e. domestic consumption. Exchange rate is the measure of the money of one currency in terms of other currency. Generally, it is identified that depreciation or devaluation of any currency positively affects the economy by enhancing its exports and shorten the import, which subsequently upsurges the economy. For instance, if the currency of exporting country depreciates, it makes the goods and services cheaper for other importing countries, which subsequently increases the demand and exporting revenue of the exporting country. On the contrary appreciation or revaluation of the currency makes the goods and services expensive for other importing countries, which consequently reduces the export level of the exporting country, hence negatively affecting the economy. So, it leads to another proof that the depreciation of any economy's currency may transfer the income from importing country to exporting country, which may subsequently affect the volume of trade and GDP as a whole. Since the exchange rate has a direct impact on the GDP and income, it could also have an impact on the consumption and saving decisions. Perhaps, It was the Alexander (1952), who first proved the relationship between the exchange rate and consumption. The relation was supported due to the inflationary impact of devaluation or

depreciation of the currency. He stated that if there is a long adjustment between wages and inflation, then the overall consumption of workers will fall, while of producer will rise, because workers have higher MPC than consumers so overall consumption will fall.

Since the exchange rate affects the consumption, conspicuously its movements may also affect the consumption. Indeed, Obstfeld and Rogoff (1998) supported this view through the theoretical framework, arguing the impact of exchange rate volatility on consumption through direct and indirect ways. The direct channel suggests that volatility (fluctuations) directly contributes toward the inflation volatility, which is disliked by the households, hence it compels them to save more and consume less. They further argued that this volatility creates fluctuations in prices which negatively affect the trade level and production level which subsequently decreases the income and consumption. Indirect channels assume that fluctuations of exchange rate increase the risk. So to commensurate that risk, firms may charge risk premium by setting higher prices, which resultantly decreases the consumption level due to higher prices. Bahmani-Oskooee and Xi (2012) supported this argument through empirical support by estimating the consumption function, including income, interest rate, exchange rate and its volatility as explanatory variables. By using quarterly data of Canada, Japan and US, using GARCH-based measure of exchange rate, they supported the argument of Obstfeld and Rogoff (1998), where results proved that exchange rate volatility had a positive impact on consumption in the case of Japan and US, and negative impact in the case of Canada. To further strengthen the argument Bahmani-Oskooee and Xi (2011) extended the list of countries to 17. Using the annual data and measuring volatility of each year by taking the standard deviation of monthly exchange rates within each year, the short-run impact was observed in the 12 countries, while it lasted in long run in 9 countries.

Not only the income, interest rate, exchange rate, and its volatility, but also external debt could also have an impact on domestic consumption. Usually, external debt is more needed when any economy faces the shortage of domestic savings and deficiency of foreign exchange to support the country development and other national objectives. Since external debt may only be helpful in boosting the economy when it is efficiently be invested in the productive income generating activities or projects, but in the case when it is not efficiently invested in the productive projects, it may negatively affect the economy by squeezing it under the burden of debt service. It always remains the topic of the discussion among the researchers that excessive debt may hamper the sustainable growth and poverty reduction Berensmann (2004), Maghyereh and Omet (2003), Pattillo, Poirson, and Ricci (2011). This is supported by the debt overhang hypothesis of Krugman (1988), which was also supported by Cohen (1994). It postulates excessive debt discourage the investment, hence preclude the economic growth by increasing the tax burden to pay the debt services. This adverse impact of external debt on the growth of HIPCS (highly in debt poor countries) was also supported by Fosu (1996), Nguyen et al. (2003). By using the data of Pakistan for 1970–2003, Hameed et al. (2008) also analyzed the association ship between the economic growth and external debt in Pakistan and identified the negative relationship between them. Since there is sufficient literature, proving the negative association between the excessive external debt and economic growth, so conspicuously country growth has direct impact on disposable income hence on saving and consumption decision. Additionally, debt services increase the tax burden, which consequently negatively affect the income and subsequently consumption.

Although there are few studies in research, considering the volatility of exchange rate as an independent variable of consumption in developed countries Bahmani-Oskooee and Xi (2011) Bahmani-Oskooee and Xi (2012), and Bahmani-Oskooee, Kutan, and Xi (2015). However, developing countries specifically the Asian countries has got very little attention in this area, despite having good position in the world market. Eichengreen (2008) Proved through his findings that Asia is evolving as a global challenge for the rest of the economic world since 1950. In 1950, the share of Asia in the global economy was around 20% while it will cross 40% by 2030.

Pakistan is also an emerging open economy of Asia, facing many economic problems like significant exchange rate fluctuations, lack of fiscal disciplines, burden of high public debt, high unemployment, unstable political and law and order situation, and poverty. This high level of economic instability creates a big challenge for policymakers to formulate and implement the fiscal, trade and monetary policies, expediting the sustainable growth of the economy of Pakistan. Since the consumption is the substantial component of the GDP, so its manifold predictability may help policymaking. So in the absence of such studies, in this paper we are taking an extra step by observing below deficiencies in the literature:

Best to our knowledge,

- None of the studies has considered the external debt as a dependent variable in the consumption function. Since the external debt already proved to have relation with economic growth, it may also affect consumption because of having direct impact of growth on it.
- None of the researchers have included the exchange rate volatility as a determinant of consumption for Pakistan's economy, despite increasing trade level.
- This study is not conducted in Pakistan since a long time, so recency impact may explore new areas.
- ARDL cointegration approach is used in this model which is more robust, describing the short as well as long-run relation. Additionally, it also postulates the speed of the adjustment. Another beauty of this model is it can be used for I (0) as well as I (1).

Therefore, using the annual data from Pakistan, we will examine the impact of external debt and exchange rate as well as its volatility on the aggregate consumption.

2. Literature review

Since the consumption is one of the major components of the demand, it has always been very important for researchers to identify its major determinants. There are a lot of studies that have included interest, income, and inflation as the determinants of the consumption. Exchange rate also got considerable attention when the exchange rate system was turned to floating rate from fixed exchange rate system. Perhaps, it was the Alexander (1952), who first proved the relationship between the exchange rate and consumption. Moreover, by using cross-sectional data of 24 countries and creating two categories of poor (high propensity to consume MPC) and rich (low MPC), Bahmani-Oskooee (1997) examined the impact of devaluation on the measure of income inequality and proved that devaluation enhances the inequality of income. Bahmani-Oskooee and Hajilee (2010) also checked Alexander's supposition by measuring the impact of depreciation on skilled and unskilled workers, they estimated the wage equations of 18 countries. Results support the pioneer (Alexander, 1952) basic notion and findings show that devaluation or depreciation of currency reduces the wages of unskilled workers in six countries and raise the wages in seven countries. In another study, Bahmani-Oskooee and Hajilee (2012), included the exchange rate as the independent variable in the consumption function in order to check the direct impact of the exchange rate on consumption. By applying the bounds testing approach by Pesaran, Shin, and Smith (2001) and estimating models for 50 countries separately, they tested the short-run and long-run impact of exchange rate on domestic consumption. Findings again supported the Alexander (1952) original argument and proved the short-term impact of currency depreciation on consumption in 37 countries, while its significant long-run impact was proved in 24 countries.

Since the exchange rate has an impact on the consumption, conspicuously its fluctuations may also have implication on the consumption through inflationary impact. In this regard, the argument given by Obstfeld and Rogoff (1998) shows the negative impact of the exchange rate volatility on the household through direct and indirect channels. Direct channel assumption implies that the corporation and households do not like the exchange rate volatility. As a result, these exchange rate variations negatively affect their leisure decisions and consumption

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patterns. While the notion of the indirect channel assumes that firms would raise their prices in order to adjust the increased exchange rate risk and higher prices would negatively impact the aggregate consumption. In an empirical study (Bahmani-Oskooee and Xi (2012)) created the function of consumption by including the four independent variables (i.e. interest, income, exchange rate and its volatility). By using Pesaran et al. (2001) bound test approach, they estimated the model using quarterly data of Japan, Canada, and USA. To measure the exchange rate volatility GARCH method was used and the results of the findings supported the Obstfeld and Rogoff (1998) argument. The results proposed that exchange rate volatility has a positive effect on consumption in case of USA and Japan, while it suggested a negative impact in the case of Canada. To further evaluate the argument Bahmani-Oskooee and Xi (2011)expanded the research to 17 countries. Unavailability of the quarterly data compel them to use annual data and since the annual data is not harmonious with the ARCH effect, so they used the monthly standard deviation of each year currency's exchange rate as the measure of the exchange rate volatility. The results proved the short-term impact in 12 countries, while in nine countries the short-term impact lasted in the long term. The long-term results revealed the consistency of Japan and Canada with the findings Bahmani-Oskooee and Xi (2011). While in the case of USA, the long-term impact of exchange rate volatility was negative. Using bound test cointegration approach and error correction model, Bahmani-Oskooee et al. (2015) also checked the short-term and long-term impact of volatility of exchange rate on the consumption for 12 emerging countries including Bulgaria, hungry, Armenia, south Africa, Bolivia, Malaysia, Poland, Colombia, Czech republic, Russia, Chile, and Philippine. Findings proved the long-term impact of exchange rate volatility on domestic consumption in all countries except Armenia, Czech Republic, South Africa, Bulgaria, and Malaysia while long-run relation proved in four countries only (i.e. Bolivia, Bulgaria, Hungary, and Russia).

Researchers have also studied the impact of external debt on growth Pattillo et al. (2002), Jayaraman and Lau (2009), (Hameed et al., 2008), Gelix Ayadi, Ayadi, Felix Ayadi, and Gelix Ayadi (2008) and Fonchamnyo (2009). After reviewing the above literature, we conclude that all studies have examined the relationship between consumption and some macroeconomic variables but none of the studies has checked the impact of external debt on consumption. As income is directly related with GDP and saving and consumption are two major components of income, as clearly the impact of external debt has already been proved on GDP, it may also have implication on consumption. Additionally, impact of exchange rate volatility is still unexplored in case of Pakistan. So in this article, we will check the impact of external debt as well as the volatility of exchange rate on domestic consumption of Pakistan.

3. Methodology

In literature consumption function has two main determinants, where determinant income is a contribution of Keynesians and interest rate is of Classicalists. Alexander added exchange rate as another determinant in the consumption function. However, exchange rate volatility is a recent contribution in the literature. While external debt is proposed as new determinant by our study, which subsequently leads to develop the below model:

$$lC_t = \alpha + blnY_t + clni_t + dlnEx_t + elnVEx_t + flnED_t + \varepsilon_t \qquad (1)$$

In above equation, C represents the consumption in real terms. While Y is the measure of the income (i.e. Gross Domestic Product GDP), I denotes the interest rate, Ex symbolizes the real effective exchange rate, such that decline reflects depreciation and volatility of the real exchange rate is measured with symbol VEX. However, external debt is represented by symbol ED.

Income and consumption are expected to have a positive relationship because the increase in income also lifts the consumption, while the sign of r is expected to inverse because incremental of interest rate will upsurge the cost of borrowing. And the impact of depreciation was discussed in

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the previous section that it transfer the income from consumers or low skilled workers (high MPC) to producers or high skilled workers (low MPC), that may cause aggregate consumption to decline. However, the sign of d is projected to be positive, in case if Alexander's claim is proved to be valid. Additionally, the sign of e is expected to be negative or positive because it is dependent upon the reaction of the consumers toward the volatility of inflation caused by exchange rate volatility, it will be positive if consumer increases the current consumption in order to beat the future inflation and vice versa. Lastly, the expected sign of is negative if the debt overhang hypothesis exists in case of Pakistan.

Following the Pesaran et al. (2001) and Bahmani-Oskooee and Xi (2012), we specify Equation (1) into Error Correction Model (Equation 2) in order to distinguish the short-term impact of exchange rate volatility on consumption from long-run impact on it.

$$\Delta lnC_t = \alpha_t + \sum_{i=1}^{ni} \beta_i \Delta lnc_{t-i} + \sum_{i=0}^{n2} \emptyset_i \Delta lnY_{t-i} + \sum_{i=0}^{n3} \delta_i \Delta lnr_{t-i} + \sum_{i=0}^{n4} \xi_i \Delta lnEx_{t-i} + \sum_{i=0}^{n5} \gamma_i \Delta lnVEx_{t-i}$$
$$+ \sum_{i=0}^{n6} O'_i \Delta lnED_{t-i} + \omega_o lnY_{t-1} + \omega_1 lnr_{t-1} + \omega_2 lnEx_{t-1} + \omega_3 lnVEx_{t-1} + \omega_4 lnReD_{t-1} + \mu_t \quad (2)$$

The above equation-II postulates the short-run and long-run relationship, where the short-run impact is measured through the coefficients of first differences and long run through the estimates $\omega_1 - \omega_4$ normalized on ω_0. However, in order to validate the long-term estimates, the joint significance of the level lagged variable must be established to check the existence of level of cointegration among the variables. Pesaran et al. (2001) recommend applying F-test with a new critical value that they tabulated. When they provide the upper bound critical value, all the variables in the model are assumed to be integrated of I(1) one order, while the lower bound critical value propose that variables in the model are assumed to be stationary or integrated on I (0) order. If the value of the calculated F statistic is greater than the upper bound critical value, then the variables are proved to be cointegrated. Upper bound critical value can also be used in the situation where some variables are I (0) while some are I (1). To check the stationarity, we apply ADF unit root test.

4. Estimated results

We estimate the error correction model in this section using yearly data of Pakistan from Pakistan for the period 1980–2014. Data of all variables were readily available on the World Bank except the volatility measures of the effective exchange rate of the Pakistani rupee.

The very first step of the analysis is the application of unit root test. We have applied the ADF test to check the unit root in the data (Table 1).

Results reveal that variables consumption, GDP, Exchange rate volatility, and external debt are non-stationary at I (0) but they become stationary after taking the first difference. After confirming the stationary characteristic, we will move toward the estimates coefficients of short run, long run, and error correction. We imposed the maximum two lags and used Schwarz criterion Inf. To select the optimum lags. Results are reported in (Table 3).

As the first step in ARDL is bound testing and it is significant on 1% level of significant (Table 2). Other results are reported in three panels of Table 3. Short-term results are reported in Panel A, while long-run results in panel B. Panel C reports the diagnostic statistics. Conspicuously at least one coefficient of the External debt, Exchange rate, GDP and interest rate is significant at 1%, while the volatility of exchange rate is significant on 10% level.

It proves that not only the exchange rate and its volatility, but external debt also has a significant impact on consumption in the short run. The short-run impact of all variables translates into long run significantly.

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Table 1. Unit root test

Variable	ADF Test		PP Test		KPSS Test	
	Intercept	Intercept and Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend
lnc_t	−0.246 (0)	−3.368* (0)	−0.051 (9)	−3.368** (0)	0.695* (5)	0.117 (2)
Δlnc_t	−6.768*** (0)	−6.694*** (0)	−9.671*** (8)	−11.675*** (10)	0.057 (3)	0.057 (3)
lny_t	−1.492 (1)	−2.349 (1)	−2.835* (1)	−2.468 (1)	0.696** (5)	2.467 (1)
Δlny_t	−3.477** (0)	−3.642** (0)	−3.449** (2)	−3.599** (3)	0.401 (3)	0.115 (1)
lnr_t	−8.734*** (0)	−8.299*** (0)	−8.453*** (1)	−8.049*** (1)	0.249 (1)	0.114 (2)
Δlnr_t	−8.436*** (0)	−8.096*** (0)	−17.737*** (20)	−16.350*** (19)	0.279 (3)	0.133 (2)
$lnEx_t$	−2.686	−3.505** (0)	−2.147 (3)	−2.616 (3)	0.296 (4)	0.070 (3)
$\Delta lnEx_t$	−2.728 (1)		−3.350** (3)	3.315* (1)	0.066 (2)	0.08 (2)
$lnVEx_t$	−2.128 (0)	−1.665 (0)	−2.347 (2)	−2.441 (2)	0.240 (4)	0.081 (4)
$\Delta lnVEx_t$	−5.496*** (0)	−3.505** (0)	−5.512*** (3)	−5.418**** (3)	0.057 (1)	0.05 (1)
$lnred_t$	1.098 (3)	−2.339 (3)	1.587 (9)	−1.005 (9)	0.651** (5)	0.157** (4)
$\Delta lnred_t$	−5.308*** (1)	−6.034*** (1)	−4.000*** (3)	−4.506*** (3)	0.359 (3)	0.068 (3)

1) ***, **, * represents significance at the 1%, 5%, and 10% level, respectively.
b) Schwarz Info Criteria is used, where default maximum length (8) was used for ADF test.

Table 2. Bound test

F- statistic	5.268***	
Critical Values		
Significance Level	Lower Bound	Upper Bound
10%	2.26	3.35
5%	2.62	3.79
1%	3.41	4.68

Note: *** represents significance at the 1%.

The coefficient of income seems to have expected positive sign, supporting the Keynesians, while the measure of interest seems to have a positive sign which is not in accordance with the classical view. There can be two obvious reason for that positive sign of real interest rate measure: most of the time real interest rate is negative (inflation is more than nominal interest rate) in sample data, which proposes that future value of investment will be less than current value in real terms, discouraging consumers from saving, additionally the high level of inflation reduces the purchasing power, increases the marginal propensity to consume, as a results consumers are compelled to increase their consumption.

Moreover, Exchange rate is significantly positively related with consumption as per our expectations, supporting Alexander's (1952) argument that in the long run, currency depreciation lowers the consumption. The coefficients of exchange rate volatility carry a negative sign, because it may create uncertainty in inflation, which subsequently encourages saving and discourages consumption. Lastly, external debt carries significant and expected negative sign, proving external debt may negatively affect the consumption. This result indirectly confirmed the findings of many studies (Fosu, 1996; Hameed et al., 2008) who have proved the negative impact of excessive external debt on economic growth. Since the external debt has a negative impact on income (the measure of the economic growth), it has also shown the negative impact on its major component consumption (consumption and saving are only components of income).

Table 3. ARDL results

Panel A: Short Run Coefficients

Lag Order	Δlnc_{t-i}	ΔlnY_{t-i}	Δlnr_{t-i}	$\Delta lnEx_{t-i}$	$\Delta lnVEx_{t-i}$	$\Delta lnED_{t-i}$
0		0.490***	0.035***	0.065	−0.018*	−0.704***
		(3.686)	(2.909)	(0.528)	(−2.090)	(−5.854)
1	−0.344**			−0.224		0.258
	(−2.491)			(−0.2240)		(1.593)
2				−0.285***		−0.235**
				(−2.997)		(−2.205)

Panel B: Long Run Coefficients

Constant	lnY_{t-1}	lnr_{t-1}	$lnEx_{t-1}$	$lnVEx_{t-1}$	$lnReD_{t-1}$	
2.310	0.736***	0.053**	1.216***	−0.079***	−0.339**	
(0.901)	(8.240)	(2.550)	(3.427)	(−3.038)	(−2.856)	

Panel C: Diagnostic Statistics

	ECMt-1	LM	RESET	CS	CS.SQ	Adj. R SQ
	−0.666		2.092	S		
	−5.107	1.355			S	0.998

a) T-ratios of the coefficients are in parentheses.
b) LM test critical value is 1.3559 that is not significant at more than 10% of the significance level.
c) RESET is Ramsey's specification test. The critical value at the 5% level of significance is 3.84

However, the long-run estimates will be meaningless without estimating the cointegration. So F statistics along with some other diagnostic tests results are reported in Panel C. The calculated F is significant on 1%, supporting the cointegration among all variables. We have also estimated the ECMt-1. The coefficient of ECMt-1 is significantly negative, which shows cointegration and suggests that the adjustment of variables is toward equilibrium in long run. Apart from the F test and ECMt-1, we have also imposed some other diagnostic test. To check the serial correlation we have applied the LM (Lagrange Multiplier) test, while for model specification we have applied Ramsey RESET test.

We could not reject the null hypotheses in both, implying that residuals are free from serial correlation and model is free from misspecification. CUSUM and CUSUM SQUARE are applied to the residuals of the optimum error-correction model to test the stability of short- and long-run coefficients. Both lines of CUSUM and CUSUM SQUARE remains within the 5% level of significance, represented by two straight lines (Figure 1), implying that estimated coefficients are stable.

4.1. Concluding remarks

As household consumption constitutes a substantial portion of overall spending of every country, policymakers always consider its determinants for the fine-tuning of the economy. Literature proves that national income or disposable Income and interest rate are two prominent determinants of the household consumption. Rapid growth of international trade and global financial crises have proved the strong intereconomies links, creating a strong reason to consider the exchange rate as the determinant of the consumption. Indeed, Alexander (1952) was the pioneer to consider this determinant, who argued that: if there is an adjustment lag between wages and inflation, then inflationary impact of depreciation or devaluation may increase the MPC of workers and decrease the MPC of producer and because of higher MPC of workers, overall consumption decreases. Few studies have also studied the impact of exchange rate volatility on consumption. Since the uncertainty of exchange rate has a direct impact on inflation uncertainty, it may positively or negatively affect the consumption.

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Figure 1. Graphical exhibition of the CUSUM and CUSUM Sq. tests.
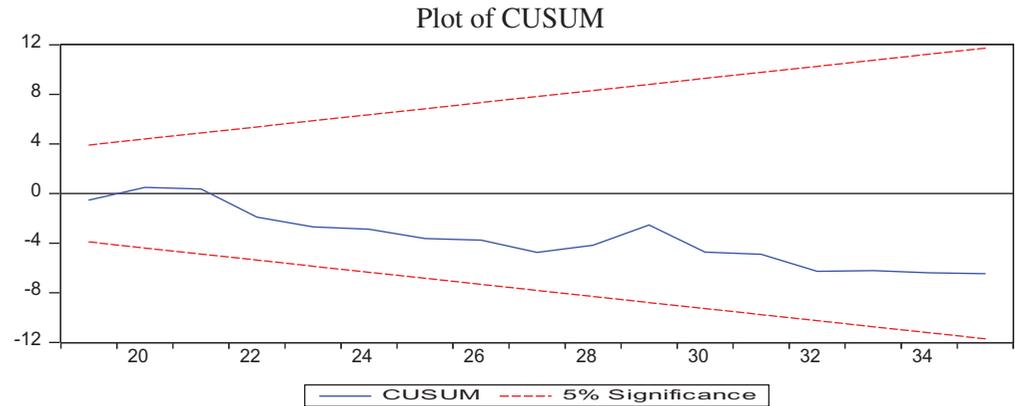
Plot of CUSUM

The straight lines denote critical bound test at 5% significance level

Plot CUSUM Sq.
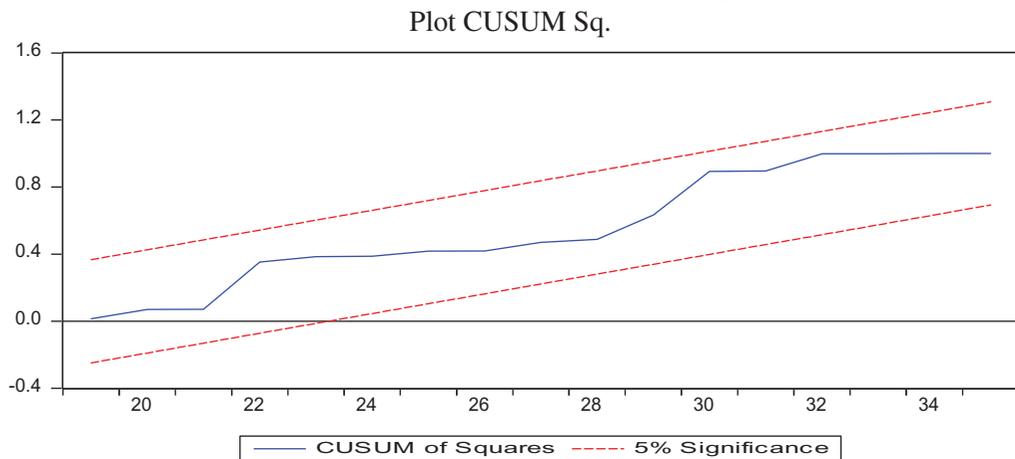
The straight lines denote critical bound test at 5% significance level

In addition to the exchange rate volatility, we argue that external debt may also impact the consumption. Since the negative impact of excessive external debt on economic growth is already empirically proved and supported by debt overhang hypothesis, it may also affect the consumption negatively. So we propose consumption as a function of income, interest rate, exchange rate, its volatility (through GARCH), and external debt. We use yearly data of Pakistan (1980–2014) and apply the bound test approach, cointegration and error correction model to check the short- and long-run relation, and speed of adjustment toward equilibrium. Fascinatingly all five variables have a significant short-run as well as long-run impact on consumption.

The result gives strong implication for the policymakers and firms. The findings show that the exchange rate and its volatility affect the consumption through the inflation volatility at the extent where consumers are compelled to increase the consumption despite having higher interest rate on savings. Furthermore, policymakers are unable to fine-tune the economy through interest rate without controlling exchange rate and its volatility. Since external debt is also negatively related with consumption, implying inefficient or unproductive use of external debt. Additionally, our findings also support the arguments of Obstfeld and Rogoff (1998) as well as Alexander (1952).

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Author details
Ameet Kumar[1]
E-mail: ammeet.kumar@iba-suk.edu.pk
ORCID ID: http://orcid.org/0000-0001-5332-7718
Niaz Ahmed Bhutto[1]
E-mail: niaz@iba-suk.edu.pk
Khalid Ahmed Mangrio[1]
E-mail: khalid.ahmed@iba-suk.edu.pk
Muhammad Ramzan Kalhoro[1]
E-mail: ramzan.kalhoro@iba-suk.edu.pk
[1] Department of Business Administration, Sukkur IBA University, Sukkur, Sindh, Pakistan.

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Appendix A

The yearly data of all variables for the period 1980–2014 is extracted from the wdi database of World Bank

Variables:

lnc = Household real consumption

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lny = Real GDP as a measure of income. Nominal GDP is deflated by CPI to arrive at real GDP (2010 = 100).

lnr = Long-term interest rate measured by government bond yield.

lnEx = Index of the real effective exchange rate. A decline reflects a depreciation.

lnred = Nominal External debt stocks is deflated by CPI to arrive at real External Debt.

lnVEx = Volatility measure of the real effective exchange rate. It is generated using GARCH (1,1) method. For a detailed explanation of this method and its other applications see Bahmani-Oskooee and Xi (2012)