7-1-2015

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Abdur Rehman Aleemi
Institute of Business Administration, Karachi

Muhammad Azam
Iqra University, Karachi

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Recommended Citation

Aleemi, A. R., & Azam, M. (2015). The nexus of financial deepening, economic growth, and poverty: The case of Pakistan. *Business Review*, 10(2), 83-99. Retrieved from <https://doi.org/10.54784/1990-6587.1355>

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ARTICLE

The nexus of financial deepening, economic growth, and poverty:

The case of Pakistan

Abdur Rahman Aleemi,

Institute of Business & Technology, Karachi, Pakistan.

Muhammad Azam

Iqra University, Karachi, Pakistan.

Abstract

This study investigates the nexus of financial development, economic growth, and poverty for Pakistan over a prolonged period of time, 1960-2012. Autoregressive Distributed Lag (ARDL)-Bounds testing approach to cointegration and Unrestricted Error Correction Model (UECM) along with VECM Granger causality have been applied to examine the long-run dynamic relationship among financial development, economic development and poverty. For that purpose, we have developed two models and adopted a new and relatively strong proxy for financial development. The results suggest that financial development negatively affects both long-run and short-run economic growth. However, financial development is found to be positively affecting per capita consumption in the long run.

KeyWords: Financial development, Economic growth, Poverty, Democracy, Dictatorship, ARDL- bounds testing, VECM Granger Causality.

JEL Classifications: E52, H11, I30, O40

Introduction

Over the last few decades various financial depth-measures have been extensively exploited by both researchers and policy makers mostly in regards to the financial sector development (Levine, 1997; Mirdala, 2011; Masoud and Hardaker, 2012). This quest has been more swiftly carried out since the world embraced the liberalization regime and the shift towards globalization, resulting in 'financial integration'. And financial depth has become the focal point due to its potential impact on the real economy. Financial sector's depth and size are closely associated by and large with overall economic wellbeing of a nation. Higher per-capita income is believed to result in higher growth in financial assets and economic growth (Mirdala, 2011; Asad and Ahmad, 2011). However on one hand, finance and economic growth are believed to be deeply interconnected, on the other (Robinson, 1952) rather provides an opposite generality as "where enterprise leads, finance follows". Regarding the relationship of finance and poverty, (Berthelemy and Varoudakis, 1996) postulates that poor financial development can potentially lead to a kind of "poverty trap" as there is a possibility of the existence of multiple steady state equilibrium.

Numerous studies have tried to explain the effects of the financial development on variety of subjects in Pakistan. For instance (khan and Qayyum, 2007) examined the association between financial development and economic growth taking into account trade liberalization and financial reforms. Another notable piece of work is that of (Khalid et al. 2011) who investigated and incorporated remittances into the model. Similarly (Shahbaz et al. 2013), has made their contribution by studying the effects of financial development on agricultural growth in Pakistan. Almost all of the early research in this field focused on the ratio of M2 over GDP as a proxy of financial depth. However, this is said to be a less

powerful and misleading proxy (Beck et al. 2000; Deidda and Fattouh, 2002; Favara, 2003; Khan and Qayyum, 2007). Further some argue that the ratio of M2/GDP might prove to be a poor proxy as M2 which is mostly an indicator to provide and carry out transaction services rather than intermediation function of the financial system, (Khan and Senhadji, 2003).

Keeping these perspectives in mind, we have revisited the relationship between financial deepening and economic growth with new evidences. This study contributes in two ways; Firstly financial depth has been measured with a relatively strong and newly devised proxy of M3/GDP for the first time in the case of Pakistan. Secondly we have investigated political stability and its role in the economic betterment of the country which contribute to poverty reduction. Because Pakistan has witnessed frequent political chaos, uncertainty, instability and un-democratic change of governments, which might have negative effects on the socio-economic horizons of the Pakistani economy

Literature Review

The popularity of the subject matter particularly in the recent past and its implications after the global financial crisis has increased the interest in this field. This can be observed from the overwhelming amount of literature that is pouring down from all corners with variety of aspects, scope and dimensions being studied and documented (Stolbov, 2012).

Finance-growth: nexus

It is now a well-established fact that finance is instrumental in sustaining the economic growth via three main channels; pooling of resources, efficient resource allocation and monitoring like to reduce the risk of moral hazard, transaction costs, friction and adverse selection among others, (Rajan, 1996). While finance does not have a direct impact to drive economic growth but it does play a very important role through these channels. King and Levine (1993) suggest that financial depth can predict economic growth. They revisited a cross country analysis for 80 countries over the period of 1960-1989, and confirmed that finance and growth are positively linked. They found that financial depth can significantly induce economic growth. Levine (2003) has examined that finance is sometimes not even considered as worthy of discussing by some researchers and economists including noble laureates like (Meier and Seers, 1984) and (Lucas, 1988) stating that “the role of finance in promoting economic growth is over stressed”. However, Miller (1998) states that financial markets contribute to economic growth which is a proposition almost too obvious for serious discussions. Rousseau (2003) examines how well the existing historical time series support the finance-growth nexus.

However it is worth noting that most of the empirical studies under the boundaries of finance-growth nexus do rely mostly on cross countries analysis (Levine and Zervos, 1998; Rajan and Zingales, 1998; Mirdala, 2011; Samargandi, et al. 2013; Christopoulos and Tsinas, 2004; Gries and Meierrieks, 2011; Ahmed, 2010; Masoud and Hardaker, 2012; Sandoyan and Davoyan, 2012). There are very few studies focusing on individual countries and country specific variables and thus very few evidences on individual countries are available (Pradhan, 2010; Odhiambo, 2011; Khan and Qayyum, 2007).

Finance-growth: consequences

The empirical literature available on the finance-growth nexus largely suggests positive linkages and it seems to be almost an issue of consensus from the results produced in the empirical literature stretched over decades of work. Levine (2003) put it in this way that the empirical literature produces remarkable consistent results. And it seems that finance is considered as one of the gearing apparatus for growth. Empirically, an important twist has been produced by (Easterly et al. 2000), who finds the presence of a threshold between financial depth and growth volatility. They estimate that if credit to private sector goes beyond 100% of GDP, growth volatility starts increasing. The phenomenon has been linked

to the law of diminishing returns where more financial depth is said to have a vanishing effect on growth over time. Similarly (Eschenbach and Francois, 2005) find this threshold to lie between 70 to 100%. And more recently (Cecchetti and Kharroubi, 2012) discover that financial development may become a drag on aggregate productivity growth after the level of credit to GDP exceeds 100%. Similarly (Arcand et al. 2012) conclude that when credit/GDP exceeds 100%, finance yields negative impacts on growth. They further confirm the vanishing effect. Some other recent studies found non-linearities in the relationship (Wongswan et al. 2013; Augier and Soedarmono, 2011; Samargandi et al. 2013).

Finance-growth-poverty: the triangle

Although the finance-growth nexus is exploited extensively in the literature but the empirical literature in this regard is very limited. The impact of financial development on poverty is documented on one hand and that of economic growth on poverty on the other. Majority of the existing literature in this regard covers mostly Asian and Latin-American countries and to some extent covers Sub-Saharan Africa. However, the empirical literature concerning the effects of financial development on poverty is by and large does not reach to a conclusive end and still it is unclear that whether effects of financial development really trickle down to boast a real impact on poverty reduction. In this regard the channels and mechanisms for financial development to contribute towards poverty reduction are very important.

Some of the mechanisms identified in the contemporary literature are that financial development can provide enhanced opportunities to the poor segment of the society to have formal access to finance and financial sector. Further, it provides the opportunity to accumulated savings and borrowings to start their own small ventures. Odhiambo, (2010) examines the inter-temporal causal relationship between financial development and poverty for the economy of Zambia. He has applied ARDL Bounds testing criteria and finds that financial sector development leads to reduction in poverty. Pradhan, (2010) investigates cointegration and causality for India over the period of 1951-2008 and finds the presence of long run relationship among finance, growth, and poverty. Abdelhafidh, (2013) has analyzed poverty and inequality and tried to explore the nexus growth-inequality-poverty for developing and developed countries. Under the simultaneous equations modeling, the findings of (Abdelhafidh, 2013) conclude that financial development is a mean to economic growth and reduces poverty in the case of middle and high income countries whereas low income countries represent the opposite results. Azra et al. (2012) concluded that financial development significantly led to the reduction in poverty for Pakistan.

Hence in the light of the above discussions, studies and their findings, the re-consolidation of the finance-growth nexus cannot be ruled out particularly after the recent episodes of the financial crises. Further for a developing country like Pakistan, it is of equal importance to keep a prying check on the poverty for the socio-economic development of the country, because the said triangle is very important for the policy makers.

Methodology

Auto Regressive Distributed Lag (ARDL) based bounds testing procedure to co-integration, recently advanced by (Pesaran et al. 2001), has been adopted to examine the long run dynamics relationship among financial development, economic development and poverty. The pragmatic grounds for adopting the bounds-testing approach to co-integration are that it is useful and applied regardless of the condition that no matter if the variables in the model are integrated of the same order or different, or even fractionally integrated. Moreover the Bounds Testing approach to co-integration is found to be more suitable in small samples as compared to the traditional Engle-Granger and Johansen and Juselius methods of Cointegration. Further the ARDL can easily be adapted to yield a dynamic mechanism of unrestricted error correction model (UECM) by means of simple linear transformation. The

UECM has a greater advantage that without compromising to lose the long run information, it can integrate the short run underlying forces with the long run equilibrium(Shahbaz et al. 2013). And above all, under the bounds testing UECM, we can simultaneously estimate both the long and short run dynamics of the parameters in a single equation setting, hence providing a great deal of ease to researchers to deal with the issues of simultaneity and endogeneity in the model. An ARDL (p,q) model in its basic form can be represented as:

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \beta_1 x_{t-1} + \sum_{j=1}^p \gamma_j \Delta y_{t-j} + \sum_{i=0}^q \delta_i \Delta x_{t-i} + u_t \dots (1)$$

Similarly an ARDL (p,q) model in the form of unrestricted error correction model (UECM) can be expressed from equation (1) as:

$$\Delta y_t = \sum_{j=1}^{p-1} \gamma_j \Delta y_{t-j} + \sum_{j=0}^{p-1} \delta_j \Delta x_{t-j} + \phi[y_{t-1} - \{\beta_0 + \beta_1 x_{t-1}\}] + \varepsilon_t \dots (2)$$

Where y_t the growth rate of real GDP, x is a set of explanatory variables, and ε_t is a white noise or stochastic disturbance term expressed under the assumption $\varepsilon_t \sim IID(0, \sigma^2)$. Further γ and δ stands for the short run coefficients for the lagged dependent and explanatory variables respectively. Moreover β represents the coefficients in the long run and ϕ denotes the speed of adjustment towards the equilibrium process in the long run. The expressions within the square brackets include the regression for the long run growth that tends to act as forcing for equilibrium. Hence keeping these parameters and background information in mind, alternatively the equation (2) can be represented to yield the following models:

3.1 Model-1

$$\begin{aligned} \Delta \ln y_t = & \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln y_{t-i} + \sum_{j=0}^q \beta_j \Delta \ln M3/GDP_{t-j} + \sum_{k=0}^r \beta_k \Delta \ln CPS_{t-k} + \sum_{l=0}^s \beta_l \Delta \ln TOP_{t-l} \\ & + \sum_{m=0}^t \beta_m \Delta \ln DR_{t-m} + \beta_n D + \alpha_0 \ln y_{t-1} + \alpha_1 \ln M3/GDP_{t-1} + \alpha_2 \ln CPS_{t-1} \\ & + \alpha_3 \ln TOP_{t-1} + \alpha_4 \ln DR_{t-1} + \mu_t \dots (3) \end{aligned}$$

$$\begin{aligned} \Delta \ln M3/GDP_t = & \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln y_{t-i} + \sum_{j=0}^q \beta_j \Delta \ln M3/GDP_{t-j} + \sum_{k=0}^r \beta_k \Delta \ln CPS_{t-k} \\ & + \sum_{l=0}^s \beta_l \Delta \ln TOP_{t-l} + \sum_{m=0}^t \beta_m \Delta \ln DR_{t-m} + \beta_n D + \alpha_0 \ln y_{t-1} \\ & + \alpha_1 \ln M3/GDP_{t-1} + \alpha_2 \ln CPS_{t-1} + \alpha_3 \ln TOP_{t-1} + \alpha_4 \ln DR_{t-1} + \mu_t \dots (4) \end{aligned}$$

$$\begin{aligned} \Delta \ln CPS_t = & \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln y_{t-i} + \sum_{j=0}^q \beta_j \Delta \ln M3/GDP_{t-j} + \sum_{k=0}^r \beta_k \Delta \ln CPS_{t-k} \\ & + \sum_{l=0}^s \beta_l \Delta \ln TOP_{t-l} + \sum_{m=0}^t \beta_m \Delta \ln DR_{t-m} + \beta_n D + \alpha_0 \ln y_{t-1} \\ & + \alpha_1 \ln M3/GDP_{t-1} + \alpha_2 \ln CPS_{t-1} + \alpha_3 \ln TOP_{t-1} + \alpha_4 \ln DR_{t-1} + \mu_t \dots (5) \end{aligned}$$

$$\begin{aligned}\Delta \ln \text{TOP}_t = & \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln y_{t-i} + \sum_{j=0}^q \beta_j \Delta \ln \text{M3/GDP}_{t-j} + \sum_{k=0}^r \beta_k \Delta \ln \text{CPS}_{t-k} \\ & + \sum_{l=0}^s \beta_l \Delta \ln \text{TOP}_{t-l} + \sum_{m=0}^t \beta_m \Delta \ln \text{DR}_{t-m} + \beta_n D + \alpha_0 \ln y_{t-1} \\ & + \alpha_1 \ln \text{M3/GDP}_{t-1} + \alpha_2 \ln \text{CPS}_{t-1} + \alpha_3 \ln \text{TOP}_{t-1} + \alpha_4 \ln \text{DR}_{t-1} + \mu_t \dots (6)\end{aligned}$$

$$\begin{aligned}\Delta \ln \text{DR}_t = & \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln y_{t-i} + \sum_{j=0}^q \beta_j \Delta \ln \text{M3/GDP}_{t-j} + \sum_{k=0}^r \beta_k \Delta \ln \text{CPS}_{t-k} \\ & + \sum_{l=0}^s \beta_l \Delta \ln \text{TOP}_{t-l} + \sum_{m=0}^t \beta_m \Delta \ln \text{DR}_{t-m} + \beta_n D + \alpha_0 \ln y_{t-1} \\ & + \alpha_1 \ln \text{M3/GDP}_{t-1} + \alpha_2 \ln \text{CPS}_{t-1} + \alpha_3 \ln \text{TOP}_{t-1} + \alpha_4 \ln \text{DR}_{t-1} + \mu_t \dots (7)\end{aligned}$$

3.2 Model-2

$$\begin{aligned}\Delta \ln \text{PCC}_t = & \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln \text{PCC}_{t-i} + \sum_{j=0}^q \beta_j \Delta \ln \text{RGDP}_{t-j} + \sum_{k=0}^r \beta_k \Delta \ln \text{M3/GDP}_{t-k} \\ & + \sum_{l=0}^s \beta_l \Delta \ln \text{CPS}_{t-l} + \beta_m D + \alpha_0 \ln \text{PCC}_{t-1} + \alpha_1 \ln \text{RGDP}_{t-1} \\ & + \alpha_2 \ln \text{M3/GDP}_{t-1} + \alpha_3 \ln \text{CPS}_{t-1} + \mu_t \dots (8)\end{aligned}$$

$$\begin{aligned}\Delta \ln \text{RGDP}_t = & \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln \text{PCC}_{t-i} + \sum_{j=0}^q \beta_j \Delta \ln \text{RGDP}_{t-j} + \sum_{k=0}^r \beta_k \Delta \ln \text{M3/GDP}_{t-k} \\ & + \sum_{l=0}^s \beta_l \Delta \ln \text{CPS}_{t-l} + \beta_m D + \alpha_0 \ln \text{PCC}_{t-1} + \alpha_1 \ln \text{RGDP}_{t-1} \\ & + \alpha_2 \ln \text{M3/GDP}_{t-1} + \alpha_3 \ln \text{CPS}_{t-1} + \mu_t \dots (9)\end{aligned}$$

$$\begin{aligned}\Delta \ln \text{M3/GDP}_t = & \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln \text{PCC}_{t-i} + \sum_{j=0}^q \beta_j \Delta \ln \text{RGDP}_{t-j} + \sum_{k=0}^r \beta_k \Delta \ln \text{M3/GDP}_{t-k} \\ & + \sum_{l=0}^s \beta_l \Delta \ln \text{CPS}_{t-l} + \beta_m D + \alpha_0 \ln \text{PCC}_{t-1} + \alpha_1 \ln \text{RGDP}_{t-1} \\ & + \alpha_2 \ln \text{M3/GDP}_{t-1} + \alpha_3 \ln \text{CPS}_{t-1} + \mu_t \dots (10)\end{aligned}$$

$$\begin{aligned}\Delta \ln \text{CPS}_t = & \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln \text{PCC}_{t-i} + \sum_{j=0}^q \beta_j \Delta \ln \text{RGDP}_{t-j} + \sum_{k=0}^r \beta_k \Delta \ln \text{M3/GDP}_{t-k} \\ & + \sum_{l=0}^s \beta_l \Delta \ln \text{CPS}_{t-l} + \beta_m D + \alpha_0 \ln \text{PCC}_{t-1} + \alpha_1 \ln \text{RGDP}_{t-1} \\ & + \alpha_2 \ln \text{M3/GDP}_{t-1} + \alpha_3 \ln \text{CPS}_{t-1} + \mu_t \dots (11)\end{aligned}$$

Where Δ is the first difference operator and D is the Dummy variable for Democracy vs. Dictatorship denoted as DvD in this study and takes the form as;

$$D = \begin{pmatrix} 1, \text{if Democracy} \\ 0, \text{if Dictatorship} \end{pmatrix}$$

The equations 3-7 and 8-11 are more like a traditional ECM except that we have replaced the error correction term with that of α 's. We are not going to restrict their coefficients and hence we call it the unrestricted ECM. The next step to ascertain the long run and steady state equilibrium in the model is to estimate the combined significance of the lagged variables in order to find cointegration. For that purpose, all we have to do is to estimate the associated F-statistic by finding the joint significance of the coefficients with the traditional Wald test. The asymptotically distributed F-statistic is tested under the null hypothesis that in the above equations 3-7, which is Model-1;

$$H_0: \alpha_0 + \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 = 0$$

And for the equations 8-11, which is model-2;

$$H_0: \alpha_0 + \alpha_1 + \alpha_2 + \alpha_3 = 0$$

The rejection of H_0 indicates the presence of long term relationship. The bounds testing procedure is based on the non-standard distribution of asymptotic joint F-statistic tested under the null hypothesis of no cointegration. According to (Pesaran et al. 2001) critical bounds for a given level of significance, the lower bound assumes the variables to be $I(0)$, while the upper bound assumes the variables to be $I(1)$. Where if the estimated test statistic falls below the lower critical bound, the null hypothesis of no cointegration cannot be rejected, and above the upper critical bound, the null hypothesis is rejected indicating cointegration among the variables in the model, whereas if the estimated F-statistic falls between the two extremes, the result is inconclusive. Furthermore we also checked for the robustness of our estimates by applying the diagnostic tests including checking for normality of the error term, serial correlation, heteroscedasticity, autoregressive conditional heteroscedasticity and functional specification.

VECM granger causality

The granger causality approach under the VECM framework has been applied to see the direction of causality. If there is long run relationship, there must be at least a unidirectional causality. For that purpose a multivariate VECM of p th order has been formulated for the two of our models as follows (Shahbaz et al. 2013; Uddin et al. 2013).

3.3.1 VECM for Model-1

$$\begin{bmatrix} Y_t \\ M3/GDP_t \\ CPS_t \\ TOP_t \\ DR_t \end{bmatrix} (1-L) = \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \end{bmatrix} + \sum_{i=1}^p (1-L) \begin{bmatrix} \alpha_{11i} \alpha_{12i} \alpha_{13i} \alpha_{14i} \alpha_{15i} \\ \delta_{21i} \delta_{22i} \delta_{23i} \delta_{24i} \delta_{25i} \\ \theta_{31i} \theta_{32i} \theta_{33i} \theta_{34i} \theta_{35i} \\ \gamma_{41i} \gamma_{42i} \gamma_{43i} \gamma_{44i} \gamma_{45i} \\ \rho_{51i} \rho_{52i} \rho_{53i} \rho_{54i} \rho_{55i} \end{bmatrix} + \begin{bmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \\ \xi_5 \end{bmatrix}$$

$$\times \begin{bmatrix} Y_{t-1} \\ FD_{t-1} \\ CPS_{t-1} \\ TOP_{t-1} \\ DR_{t-1} \end{bmatrix} \times [ECM_{t-1}] + \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \\ \mu_{5t} \end{bmatrix} \dots (12)$$

3.3.2 VECM for Model-2

$$\begin{bmatrix} PCC_t \\ M3/GDP_t \\ CPS_t \\ RGDP_t \end{bmatrix} (1-L) = \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{bmatrix} + \sum_{i=1}^p (1-L) \begin{bmatrix} \vartheta_{11i} \vartheta_{12i} & \vartheta_{13i} \vartheta_{14i} \\ \vartheta_{21i} \vartheta_{22i} & \vartheta_{23i} \vartheta_{24i} \\ \varphi_{31i} \varphi_{32i} & \varphi_{33i} \varphi_{34i} \\ \omega_{41i} \omega_{42i} & \omega_{43i} \omega_{44i} \end{bmatrix} + \begin{bmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \end{bmatrix}$$

$$\times \begin{bmatrix} PCC_{t-1} \\ FD_{t-1} \\ CPS_{t-1} \\ RGDP_{t-1} \end{bmatrix} \times [ECM_{t-1}] + \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \end{bmatrix} \dots (13)$$

Where $(1-L)$ is the difference operator, ECM_{t-1} is the lagged error correction term obtained from the long run equilibrium relationship and p is the optimal lag length based on Schwarz Information Criterion (SIC). Using the t-statistic, the significance of the lagged error correction term provides evidence for the long run causal relationship. Whereas by using the F-statistic, the direction of short run causality is found by the joint significance of the first differenced lagged independent variables. For instance, in this case when, $\alpha_{12i} \neq 0 \forall_i$ indicates that financial development granger causes economic growth and the causality runs from economic growth towards financial development and so on.

Data and specifications:

The data used is annual time series over 1960-2012, acquired from the State bank of Pakistan's Library¹. Real GDP growth rate (Y_t) is proxied for economic growth, and the ratio of $M3/GDP_t$ for financial development. **Credit to Private Sector** (CPS_t) is measured by the ratio of credit provided to private sector divided by GDP (Favara, 2003). Trade openness (TOP_t), here, is measured by summing exports and imports divided by GDP, (Khan and Qayyum, 2007). Discount Rate (DR_t) is measured by the SBP's policy rate. This variable has been selected primarily to capture the effects of the monetary policy. Per Capita Consumption (PCC_t) has been proxied for poverty reduction (Abdelhafidh, 2013 and Odhiambo, 2010).

However it should be noted that poverty is a multidimensional phenomenon and encompasses a wide range of variables², also the matter is of immense debate as different organizations and institutions describe and measure poverty in different manners. Among these, three most commonly used measures for poverty are (1) the head count ratio (2) the poverty gap and (3) poverty lines. However this study uses per capita consumption to be the appropriate proxy for reduction in poverty that is in line with the definition by the World Bank (1990).

Empirical findings and discussions

¹ The authors are exceedingly indebted to Mr. Ijaz Alam, Librarian at the State Bank of Pakistan's Library for Data compilation.
(http://www.sbp.org.pk/)

² The Sen's capability approach describes that poverty is lack of multiple freedoms people value and have reason to value (Alkire 2007)

For the order of integration, the Augmented Dickey Fuller (ADF) test with trend and intercept is performed to discover the stationary and non-stationary behavior of the variables. This is one of the most important issues to be considered while dealing with time series data in an ARDL bounds testing to make sure that none of the series we are dealing with is $I(2)$. The results of the ADF test are produced below in table 1; indicating that all the series are non-stationary at level with trend and intercept and becomes stationary at first difference which means that the series in our model(s) are integrated of order one.

Table 1

Results of unit root test.

Variables	At Level	1 st Difference
$\ln\text{GDPGR}_t$	-1.534185	-6.505635*
$\ln\text{PCC}_t$	-0.867644	-4.495931*
$\ln\text{RGDP}_t$	-2.322144	-6.260836*
$\ln\text{M3/GDP}_t$	-1.380690	-4.666849*
$\ln\text{CPS}_t$	-1.826287	-5.165441*
$\ln\text{TOP}_t$	-2.449806	-7.708047*
$\ln\text{DR}_t$	-2.840097	-4.232476*
DvD	-2.432152	-6.888823*

Note: *, ** and *** denotes significance at 1, 5 and 10% levels.

Bounds Testing for Cointegration:

The optimal lag length for the ARDL has been selected on the basis of Schwarz Information Criteria (SIC). In contrast to the AIC, the SIC is derived from a Bayesian perspective and applies a much stronger penalty for model over fitting, that can potentially lead to retain too many regressors or can lead to the selection of lag length that is longer than optimal, (Giles, 2013). For the both models, the lag length is selected as 1 by the SIC. ARDL Bounds test has been performed and the associated F-test has been obtained to find cointegration and long run relationship between the variables. The results are presented in table 2:

Table 2
Results of bounds test for cointegration.

Model-1								
Variable	$\ln Y_t$		$\ln M3/GDP_t$		$\ln CPS_t$		$\ln TOP_t$	$\ln DR_t$
F-Statistics	8.625*		1.827		5.462*		1.496	4.717**
Critical Bounds	1%		5%		10%			
	$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$		
	3.74	5.06	2.86	4.01	2.45	3.52		
R ²	0.686		0.468		0.578		0.396	0.530
Adj. R ²	0.592		0.416		0.492		0.317	0.441
F-Statistics	7.354*		2.965**		4.610**		1.948	3.805**
Model-2								
Variable	$\ln PCC_t$		$\ln M3/GDP_t$		$\ln CPS_t$		$\ln RGDP_t$	
F-Statistic	5.646*		6.503*		7.599*		1.660	
Critical Bounds	1%		5%		10%			
	$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$		
	4.29	5.61	3.23	4.35	2.72	3.77		
R ²	0.437		0.474		0.566		0.364	
Adj. R ²	0.371		0.399		0.469		0.287	
F-Statistics	3.451**		4.008**		5.813*		2.557***	

Note: *, ** and *** denotes significance at 1, 5 and 10% levels.

For the critical bounds Pesaran et al. (2001), table CI(iii) Case(III) has been adopted³ because we are neither restricting intercept nor including a linear trend in our models. The estimated F-statistic in our results clearly surpasses the upper critical bounds at 10, 5 and 1% levels when ($\ln Y_t$), ($\ln CPS_t$) and ($\ln DR_t$) are used as independent variables in model-1. This is indicating the presence of three cointegrating vectors and the null hypothesis of no cointegration is rejected. Similarly in model-2, the null hypothesis of no cointegration is rejected when ($\ln PCC_t$), ($\ln M3/GDP_t$) and ($\ln CPS_t$) are used as predicted variables. This is again showing the existence of three cointegrating vectors for model-2. Hence we can conclude that a steady state long run equilibrium relationship exists between the variables in both of our models.

³ Pesaran et al. provided us critical bounds values with numerous cases to test for the existence of the long run relationship

Long run and Short run Analysis:

The next step is to extract the long run and short run coefficients after establishing the evidence for the existence of long run relationship among the variables. For that purpose the normalized coefficients are extracted with the results reported in Table 3.

Table 3

Short run and long run analyses.

Model-1: Dependent Variable $\ln Y_t$			Model-2: Dependent Variable $\ln PCC_t$		
Long Run Analysis					
Variables	Coefficient	t-Statistic	Variables	Coefficient	t-Statistic
$\ln M3/GDP$	-1.52231**	-2.0484	$\ln RGDP$	0.639894**	4.4639
$\ln CPS$	1.114236**	1.9986	$\ln M3/GDP$	0.319786**	2.3453
$\ln TOP$	1.637697**	3.6569	$\ln CPS$	-0.02442	-0.3316
$\ln DR$	-0.87872**	-3.2911	DvD	-0.07229**	-2.9602
DvD	-0.27033*	1.9246	Intercept	2.032613**	3.3901
Intercept	1.164517	0.3167	R^2	0.43736	
R^2	0.68616		Adj R^2	0.31077	
Adj R^2	0.59286		F-Statistic	3.45492**	
F-Statistic	7.35418**				
Short Run Analysis					
Model-1: Dependent Variable $\ln Y_t$			Model-2: Dependent Variable $\ln PCC_t$		
Variable	Coefficient	t-Statistic	Variable	Coefficient	t-Statistic
$\ln M3/GDP$	-4.177330**	-2.7867	$\ln RGDP$	0.438243	1.3488
$\ln CPS$	3.133443**	2.1419	$\ln M3/GDP$	-0.148976**	-2.3475
$\ln TOP$	-0.058187	-0.0725	$\ln CPS$	0.075424	1.0913
$\ln DR$	-0.065183	-0.0816	DvD	-0.046947**	-2.2396
DvD	0.044298	0.1880	ECM_{t-1}	-0.865924**	-3.5014
Intercept	-0.034053	-0.2764	Intercept	0.033286*	1.7103
ECM_{t-1}	-0.159999**	-4.36966	R^2	0.35366	
R^2	0.4968		Adj. R^2	0.24331	
Adj. R^2	0.4088		F-Statistic	3.20492*	
F-Statistic	5.6432**				
Diagnostic Tests					
Test	F-Statistic	P. Value	Test	F-Statistic	P. Value
χ^2 Normal	0.17448	0.9164	χ^2 Normal	3.13231	0.2088
χ^2 Serial	0.36531	0.6966	χ^2 Serial	0.90857	0.4117
χ^2 ARCH	0.19887	0.6577	χ^2 ARCH	0.20836	0.6502
χ^2 White	0.15039	0.8994	χ^2 White	0.67256	0.7285
χ^2 Ramsey	1.93496	0.2164	χ^2 Ramsey	1.17155	0.2857

Note: *, ** denotes statistical significance at 10 and 5% levels. Model-1: An ARDL (1, 1, 1, 1, 0, 0) selected on the basis of SIC; Model-2: An ARDL (1, 1, 1, 1, 0, 0) selected on the basis on SIC.

Table 3 indicates that all of the estimated regressors are statistically significant except that of CPS in model-2. However the most notable thing in these estimates is that of the coefficient for M3/GDP proxied for financial development, which is negative in the case of economic growth in model-1. This is quite surprising and leading towards the interesting proposition of the law of diminishing returns. It can lead us to the vanishing effect of finance on growth. Empirically saying, a 1% increase in financial depth will lead to a 1.522 percentage decrease in economic growth or GDP growth rate in the long run on average and 4.177% decrease in the short run. This result is contrary to most of the previous studies like (Ahmed and Ansari, 1998) and (Azra et al. 2010). They found positive relation between the proxies of financial development and economic growth. One of the possible reasons could be that almost all of the previous studies used the ratio of M2/GDP as a proxy to measure the level of financial depth, whereas in this study a more reasonable and stronger and the less liquid proxy for financial depth has been adopted that is M3/GDP, which refutes the previous results in this context. Another reason of the negative coefficient could possibly be that in Pakistan, most of the resources are utilized either for the current account deficits or debt servicing, and at the end does not translate into real economic development or growth. Meanwhile these results strongly support and reinforce the belief of the contemporary literature that growingly became skeptical about the relationship and the positive nexus of finance and development. Hence once again it can be reiterated that the nexus which once seemed to be strong enough beyond any doubt, does not remain to be that much robust any more.

Further, the coefficient of CPS is positive and is highly significant indicating that in the long run 1% increase in the credit to private sector can lead to 1.11% increase in economic growth in the long run and 3.133% in the short run. This highlights the importance of the private sector and the government should tend more to nurture the same. Similarly a unit increase in the openness to international trade may lead to 1.637% increase in GDP in the long run whereas in the short run the same is found to be insignificant. Further the coefficient for the discount rate is also found to be statistically significant at 5% level, indicating that 1 unit increase in discount rate will lead to a decrease of 0.87% in GDP Growth rate in the long run. This shows that increasing discount rate will result in increase in cost of doing business. These results are in line with that of (Khan and Qayyum, 2007).

The fruits of democracy does not transcend for sure in the case of Pakistan, as evident from the negative long run coefficient of DvD. It is a dilemma that true democratic traditions are lacking in our political system. There are biased voters or voting tendency based on the customs of community, ethnic, tribal, regional and linguistics leads to the election of inept and tactless elements. Additionally the political parties also seem to be not rising above either from the personal agendas of their leaders or affiliation to a particular group. The parties in particular seem to be serving the cause of their leader. These things among others are certainly hindering the true essence of democracy to transcend into meaningful and effective development policies and exacerbating the suffering of the masses.

As per as Model-2, the real GDP per capita positively contributes for about 0.63% in per capita consumption in the long run but not in the short run. Similarly M3/GDP positively impacts PCC on average 0.32% in the long run. These results are in line with that of (Azra et al. 2012; Pradhan, 2010) but interestingly the same is having negative impact in the short run. Further CPS is insignificant both in the long and short run in regards to poverty reduction in Pakistan. Again the dummy for democracy (DvD) fails to live up to the expectation. It is negatively affecting both the long run and short run behavior in per capita consumption. The estimated error correction terms in both of our models are favorably negative and statistically significant with a coefficient value of -0.1599, which indicating that variables in the model-1 move towards long run equilibrium with relatively low speed. It is suggesting that as a feedback mechanism, about 16% of the disequilibrium from the previous period adjusts back

to the long run equilibrium in the current period. Similarly in model-2,the error correction term is found to be -0.866, indicating that in the short run the variables move towards long run equilibrium with high speed of about 86%.

The structural stability for both of the models has been tested by the cumulative sum of recursive residuals (CUSUM) and cumulative sum of recursive residuals square (CUSUMSQ) with the results being reported in Figure 1 and Figure 2 for Model 1 and Model 2 respectively. The tests are significant at 5% level indicating that both of the estimated models are dynamically stable.

Figure 1: Stability test for Model-1

Figure 2: Stability test for Model-2

VECM Granger causality

The existence of the long run relationship among the variables in the both models leads to investigate the direction of causality. We applied the granger causality approach under the VECM framework with the results being presented in table 4 below. The finding of causal relationship among financial development, economic growth and poverty reduction will have crucial importance for policy makers. It will help to understand the underlying dynamics in the relationship between finance, growth and poverty.

Table 4
VECM granger causality analysis.

Model-1								
Variables	$\ln Y_{t-1}$	$\ln M3/GDP_{t-1}$	$\ln CPS_{t-1}$	$\ln TOP_{t-1}$	$\ln DR_{t-1}$	ECM_{t-1}	R^2	F-Statistic
$\ln Y_t$	-	8.24207* (0.0010)	7.92038* (0.0012)	6.53033* (0.0034)	6.42146* (0.0037)	-0.16528* (-4.15458)	0.66 0	13.6318*
$\ln M3/GDP_t$	2.66061*** (0.0916)	-	1.24971 (0.2970)	1.24978 (0.2970)	1.71255 (0.1928)	-	0.23 6	2.1630***
$\ln CPS_t$	3.99453** (0.0048)	2.62169*** (0.0845)	-	2.24857 (0.1181)	1.94183 (0.1561)	- 0.12475** (-2.36032)	0.35 1	3.6638**
$\ln TOP_t$	1.873537 (0.1662)	1.884078 (0.1646)	2.026341 (0.1445)	-	3.94630** (0.0269)	-	0.29 8	2.9341*
$\ln DR_t$	6.91880* (0.0025)	5.02639 (0.0110)**	2.97336** (0.0620)	2.41145*** (0.07465)	-	-0.13026* (-2.57445)	0.31 0	3.4782**

Model-2							
Variable	$\ln PCC_{t-1}$	$\ln M3/GDP_{t-1}$	$\ln CPS_{t-1}$	$\ln RGDP_{t-1}$	ECM_{t-1}	R^2	F-Statistic
$\ln PCC_t$	-	3.66382** (0.0122)	3.47823** (0.0155)	1.35555 (0.2684)	-0.52901* (-3.18770)	0.584	7.7245*
$\ln M3/GDP_t$	3.13985** (0.04291)	-	3.51225** (0.0688)	0.98678 (0.4242)	- 0.54843** (-2.15747)	0.396	3.7681**
$\ln CPS_t$	3.96061** (0.0067)	2.76022 (0.2515)	-	4.53784** (0.0392)	-0.12872* (-1.86388)	0.419	4.8334**
$\ln RGDP_t$	0.05831 (0.8102)	1.12288 (0.2947)	2.30899 (0.1113)	-	-	0.350	1.78101

Note: *, **, *** denotes statistical significance at 1, 5 and 10% levels

Table 4 shows that all of the estimated lagged error correction terms are statistically significant with the expected negative signs except for trade openness ($\ln TOP_t$) and financial development ($\ln M3/GDP_t$) equations in model-1, whereas, only the ECM_{t-1} for real GDP ($\ln RGDP_t$) is found to be insignificant in model-2. It should, however be noted that the estimates for ECM_{t-1} are reported only for those equations where the long run relationship has

already been established. The statistical significance of the ECM_{t-1} indicates that the exposed shocks by the system converge towards long run equilibrium with relatively low speeds of 16% in the case of economic growth, 12% for credit to private sector and 13% for discount rate in model-1. Similarly in model-2, the speed of adjustment towards long run equilibrium for poverty equation was found to be 52% and 54% for financial development, whereas credit to private sector is found to be moving with a slow speed of 12% in the country.

Moreover in the long run feedback effect can be observed between economic growth, credit to private sector and discount rate in model-1. Model-2 indicates the effect between poverty, financial development and credit to private sector. Whereas in the short run, there is bidirectional causality between economic growth and financial development, economic growth and credit to private sector, and economic growth and discount rate in model-1. This implies that the government should tend towards more credit easing policies towards private sector to promote business activity. As a matter of fact, historically discount rate in Pakistan was quite high compared to other countries in the region. The access to financial services at cheaper rates will have a diminishing effect on the cost of doing business which in turn will augment growth on aggregate level. In addition trade openness and discount rate also granger causes each other, which further exerts the importance of monetary policy. Moreover unidirectional flow is observed from growth towards trade, from CPS towards M3/GDP and from DR towards CPS in Model-1. Similarly model-2 depicts to have bidirectional causality between poverty and financial development and between poverty and credit to private sector.

Concluding remarks

This research has revisited the relationship between financial deepening and economic growth with new evidences. In numerous studies, financial depth has been measured by the ratio of M2 over GDP which is said to be a less powerful and misleading proxy (Beck et al. 2000), (Deidda and Fattouh (2002), (Favara, 2003), (Khan and Senhadji (2003) and (Khan and Qayyum, 2007). In this study, financial depth has been measured with a relatively strong and newly devised proxy of M3/GDP in Pakistan for the period from 1960 to 2012. We have also investigated political stability and its role in the economic betterment of the country which contribute to poverty reduction. Because Pakistan has witnessed frequent political chaos, uncertainty, instability and un-democratic change of governments, which might have negative effects on the socio-economic horizons of the Pakistani economy. For that purpose, we have developed two models and adopted a new and relatively strong proxy for financial development. Autoregressive Distributed Lag (ARDL)-Bounds testing approach to cointegration and Unrestricted Error Correction Model (UECM) have been applied to examine the long-run dynamic relationship among financial development, economic development and poverty.

The results suggest that financial development negatively affects economic growth both in the long and short run. This result is contrary to most of the previous studies like (Ahmed and Ansari, 1998) and (Azra et al. 2010). They found positive relation between the proxies of financial development and economic growth. One of the possible reasons could be that almost all of the previous studies used the ratio of M2/GDP as a proxy to measure the level of financial depth, whereas in this study a more reasonable and stronger and the less liquid proxy for financial depth has been adopted that is M3/GDP, which refutes the previous results in this context. Another reason of the negative coefficient could possibly be that in Pakistan, most of the resources are utilized either for the current account deficits or debt servicing, and at the end does not translate into real economic development or growth.

However, financial development is found to be positively affecting per capita consumption in the long run. These results seem to be paradoxical, however due care is necessary to interpret as poverty reduction is proxied with per capita consumption and thus

these results warrant both context and perspective. Further it was taken as a proposition that political stability or the different regimes (democratic or autocratic, led by military establishments), where democracy is believed to be contributing more to the economic growth and prosperity or wellbeing of the nation. This proposition is found to be failing during the length of this study. Moreover, the granger causality analysis revealed bidirectional causality between financial development, economic growth, credit to private sector and discount rate. Similarly bidirectional causality is found between poverty, financial development and credit to private sector.

Policy implications and directions for future research

In the light of above findings, new dimensions are explored. This study shows that nominal increase in financial depth does not support the proposition to increase the output level both in the long run as well as short run in Pakistan. It can be said that financial sector is shock producing rather than absorbing it as indicated by the crowding out effects of the discount rate. Further the government's policy to curb the levels of poverty is a strong indicator and country is facing with the twin dilemmas of both reviving growth and reducing poverty. Increasing the output level or GDP growth rate will however translate in to reduction in poverty if and only the growth is broad based. However in the long run, not only the incidence of poverty but the vulnerability of the poor to economics shocks and fluctuations is also vital to be considered on wide strategic levels. In addition, the causality analyses reveal that more open access to financial services is recommended particularly to private sector to promote business activity which in turn will enhance aggregate output. Moreover credit easing and more open access for poor segments of the society is also recommended to curb on the evil of poverty.

This study has the potential to address many underlying economic issues like the inclusion of unemployment and inequality data in the model would be an interesting continuation in this regard. The role of microfinance and financial institutions can also be incorporated in the future. On a technical note, it will be an interesting continuation to find the threshold level and confirm the vanishing effect of finance on economic growth.

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