International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies

http://TuEngr.com

TuEngr Group

PAPER ID: 11A01R

SHADOW ECONOMY, OUTREACH OF FINANCIAL INSTITUTIONS AND FINANCIAL INCLUSION: A STUDY OF BALKAN COUNTRIES

Hina Affandi [a*], Qaisar Ali Malik [a]

[a] Faculty of Management Sciences, Foundation University Islamabad, PAKISTAN.

ARTICLE INFO

ABSTRACT

Financial inclusion is a core pillar of development policy in the financial system. This research is an endeavor to empirically inspect the influence of the shadow economy and the outreach of financial institutions on financial inclusion. Annual data has been gathered from the financial institutions operating in six Balkan countries for the year 2006-2017. It is suggested that the shadow economy has a significant impact on the financial inclusions and the outreach of financial institutions is also found to have a significant effect on financial inclusion. The non-linear co-integration approach has been opted to recognize the asymmetric effects by exploring how the shadow economy and financial institutions' outreach affects financial inclusion. This research study has various implications for the financial system which can add to the improvement of the banking and nonbanking sectors of the Balkan countries.

Disciplinary: Education Sciences; Technology in Education

©2020 INT TRANS J ENG MANAG SCI TECH.

1. INTRODUCTION

Financial inclusion has a broad base of knowledge for which it is difficult to reach on to the generally accepted universal definition. However, few definitions address the significant aspects. It is vital to study the effects of the shadow economy and the outreach of financial institutions on financial inclusion. The contact of financial inclusion on economic development has not broadly been identified and is sparingly available. However, the studies that are available have identified the aggregate impact (Such studies identified the economic development over short term and long term period to see whether there exists any difference or not over short and long run (Hajilee et al., 2017)). So, it is important to see the financial inclusion from the angles of route and rate of alteration. Also, the shadow economy has special and unusual effects on the economies that are in the state of

emerging. There are different names (i.e., shadow, clandestine, illegal, black, parallel and others.) prevalent to represent a type of economy generally that excludes the intervention of governments. Such economic activities are generally unregulated rather than illicit. The growing shadow economies across the world suggest that the economic policies that are existing are not up to the mark and are burdensome. A recent focus on sustainability and efficiency in the financial framework highlights the importance of cost associated with the lending money and the reduction in such costs. Increase in competition, commercialization, changes in technology, financial liberalization and many other factors (Rhyne & Otero, 2006) have influenced the outreach of financial institutions to broaden the base of earning revenues and keeping up with financial sustainability.

The focus is on Balkan countries is crucial as they signify the potential. The challenge to Balkan economies creates the opportunity for robust economic growth. To realize the high economic growth agendas, these countries are incorporating financial inclusions and outreach of financial institutions. To diversify their economies, the recent World Bank gives advice to the Balkan countries for tightening the tax structure, which has provided room for studying the shadow economic framework prevalent as it influences the financial inclusions ultimately affecting the economic growth.

The objective of the research study is to empirically explore the effect of shadow economy and outreach of financial institutions on the financial inclusions. This research study will provide an empirical analysis of the Balkan countries that add to the literature. The use of a non-linear co-integration approach will represent the true picture of financial inclusion. This study is unique for the reason that as such as per researcher knowledge no study found in context to Balkan economies.

Shadow economy is widespread across the globe. However, there are multiple factors that are responsible for driving businesses to go underground. Law-abiding countries also have underground businesses (Schneider et al., 2010). Such underground businesses (i.e., the unauthorized and unlicensed businesses that keep their transactions secret to evade the taxes.) are able to avoid regulations and taxes to get the benefits against the prospective costs of punishment and detection that are related to defiance of the law. The policy challenges include the entry that is limited in the shadow economy and to counter revenue leakages to cater its expansion as mentioned by Schneider (2012). The existing literature has shown the factors that affect the shadow economy but the effects of shadow economy on financial inclusion have not been addressed widely. The literature based on the theoretical grounds is marked by the entry costs in the formal business environment that have multiple laws and regulations crucial for businesses to operate. However, this leads the businesses to function in the shadow sector to avoid such costs (including costs related to the environmental regulations, bureaucratic delays, licensing requirements, etc.) (Goel & Nelson, 2016); Gërxhani, 2004; Schneider and Enste, 2000). The empirical literature has emphasized multiple factors that are associated with shadow economy. However, such factors have shown mixed results associated with the significance degree (Gerxhani, 2004). This lack of consent has led to the dilemma of designing effective policies (Dreher and Schneider, 2010). There is a wide literature on the association among shadow economy and the economic growth as well as impending into the causes that lead to an increase in shadow economy. There has been found negative association between the shadow economy and education which is attributed to two prospective mechanisms that include moral or

social dynamics and the opportunity costs (Berrittella, 2015). Size and grounds of shadow economy have been investigated in 38 OECD countries by Elgin and Schneider (2016) and found that the results are entirely dependent on the methods (The study found that by using the various indicators and the cause model of multiplicity, factors contributing were found to be comparatively equal. By the use of a model of equilibrium based on general dynamics, GDP per capita growth has been found higher significantly as compared to the other components that include indirect taxes, unemployment, and other factors). A study also found that the extent of economic development of a country is not related to the shadow economy and its benefits (Markellos et al., 2016).

The efforts to escalate the financial inclusion may bring better outcomes which include a decline in credit risks and the lending costs if there is no marked reimbursement of an informal sector of the economy. The inequality has been found to have a positive association with the shadow economy that is through a decline in GDP that has been identified in a study of Dell'Anno (2016) on 118 countries. The possessions of financial development in the shadow economy have been identified in the literature (Bayar and Ozturk, 2016). This study has found the co-integrating association among the shadow economies and the development of financial sector in transition economies of European Union. A similar relationship has been found between economic activity and financial development (Chortareas et al., 2015). Though the results (trade openness and financial openness are found to be more crucial for the developed countries as compared to the developing countries with respect to the economic output) were different for the developed versus developing countries. There is considerable quantity of literature on the shadow economy and financial inclusion. Symmetric relationships have been seen widely in previous researches so it is important to consider asymmetric relationships among the shadow economy and the financial inclusion.

The entrance of new technology has entered the financial sector that helped to reduce the cost and improved service delivery (Rhyne & Otero, 2006 and Kapoor et al., 2007). The liberalization of financial markets and the regulations imposed on the other hand helped to progress the firmness of the financial institutions. These changes in the outreach of financial institutions and other financial market policies have contributed to the sustainability and efficiency improvement (Hartarska & Nadolnyak, 2007). The cost of outreach of financial institutions to the poor and to provide them with credit is a costly measure as a high cost (such costs include the monitoring, screening and administration costs per loan) of transaction costs are involved in making the small loans as compared to bigger loans (Lapenu et. al, 2002 and Paxton et al., 2002). There is a tradeoff among the outreach and efficiency that affect financial inclusion (Hermes et al., 2011). There is a cumbersome debate between the institutionalists and the welfarists who favor the significance of efficiency and sustainability and the later stress on the domination of outreach goals respectively (Hashemi & Rosenberg, 2006 and Isern & Porteous, 2005). According to Cull et al. (2007), provision of loans to individuals can do better in case of profitability. The study was conducted in 49 countries. The phenomena in which wealthier clients are focused are known as "mission drift" which also shows the tradeoff between outreach and efficiency and outreach and commercialization (Cull et al., 2009).Determinants of outreach in terms of loan size has been investigated in a study that has implications for outreach and financial inclusion (Olivares-Polanco, 2005). There has also been found important and positive connection between the bank stability and financial outreach or usage

after inducing the control variables in the model. To account the prevalence of financial outreach of the financial sector, financial services play an important obstruction for financial inclusion (Allen et al., 2014; Ahamed & Mallick, 2017). In the next section, the model and the methodology that is used have been discussed.

2. STUDY DETAILS

The variables which have been used are described in this section. To measure the short and long-run effect of the shadow economy and outreach of financial institutions on financial inclusion, six Balkan countries have been chosen for the period of 2006-2017. Financial market inclusion shows support to the financially excluded, underserved, and unserved segment of the population. To measure the financial inclusion of the market, the ratio of M3 to GDP of nonbank intermediaries and banks has been used (Hajilee et al., 2017) (M3 to GDP includes the currency that is detained outside the banking system in addition to the interest-bearing liabilities and the demand). In this study, the impact of the independent variables that include shadow economy and outreach of financial institutions has been seen on financial inclusion.

Shadow economy presents activities that are unregistered which contribute to lowering the GDP of the country. There are multiple ways to determine the shadow economy. Schneider et al (2010) identified three general themes including state of the official economy, monetary and the labor market. Ahumada et al. (2009) provided four measures including tax or regulatory surveys, discrepancies in income, currency requirements and the utilized resource. Restrepo (2015) discussed the shadow economy measured by direct and indirect approaches. The direct approach tells the most important variable for the shadow economy by the audit procedure. The indirect approach involves the measurement of a discrepancy between what should be and what is. Shadow economy is characterized by the deficient of contact to recognized financial gear and services. To evaluate the shadow economy size, we make utilization of the sharing rate of the labor force aged 15 to 64 who are active economically (Schneider et al., 2010). When measuring the financial inclusion, it is significant to mention the intensity of human capital improvement. Education interventions are often considered as the accompanying factor for increasing financial inclusion. It has been established that the shadow economy and the shadow unemployment bring positive effects reciprocally (Ciutiene et. al, 2015).

The outreach of financial institutions is measured by the average loan per borrower represented in US dollars and the loan given to female borrowers (WOMAN). Less depth of outreach is designated by the advanced values of the average loan per borrower, in this case, smaller amounts of loans are made to poor borrowers. Higher values of loan to female borrowers represent outreach in more depth as lending to women is linked with lending to the poor borrowers (Hermes et al., 2011).

The data for this study has been taken from the mix market website (www.mixmarket.org) for the outreach of financial institutions. For the data of the shadow economy and the financial inclusion, world bank and IMF websites have also been consulted apart from the aforementioned source.

3. FINANCIAL MODELS

For the formulation of the model for financial inclusion, we followed Hajileeet. al, (2014) and

Hajilee et al., (2017) for the long run which is represented as

$$Ln\ FI_t = a + b\ Ln\ S_t + c\ Ln\ ALB_t + d\ Ln\ WOMAN_t + \varepsilon_\tau \qquad (1).$$

In Equation (1), FI is the measure for financial inclusion for every economy measured as the liquid liabilities ratio (M3 to GDP). S_t Presents the shadow economy which is represented by the labor force participation which is illustrated by the active population economically in the age set of 15-64 years. ALB represents the average loan per borrower and loans given to borrowers that are female are represented by WOMAN in this equation. The coefficients in the above equation represent the longer run. To evaluate the shorter run impact of the exogenous variables, the above equation can be written, under error correction model, as

$$\Delta Ln\ FI_t = a + \sum\beta_1\Delta LnFI_{t-n} + \sum\beta_2\ \Delta Ln\ S_{t-n} + \sum\beta_3\Delta Ln\ ALB_{t-n} + \sum\beta_4\Delta\ LnWOMAN_{t-I}$$

$$+\ \theta_1 Ln\ S_{t-n} + \theta_2\ Ln\ ALB_{t-n} + \theta_3\ LnWOMAN_{t-n}\ +\ \varepsilon\tau \qquad (2).$$

Equation (2) follows the formation of the joint significance of the lagged values of the variables which depict cointegration (Pesaran et al., 2001).Cointegration bound testing approach has been used for approximation the shorter and longer run effects by means of ordinary least square (OLS) method. The short-run impacts are shown by the lag values at first difference whereas longer run impacts are shown by the estimate. It is assumed for Equation (2) that there are symmetric special effects on the financial inclusion if there are changes in the exogenous variables. As expectations change over time so this may not be the case. So, the new time series variables are formed for ΔLnS which are described as

$$Changes\ that\ are\ Positive\ (POS) = \sum \Delta LnS = \sum \max(\Delta LnSj, 0)$$

$$Changes\ that\ are\ negative\ (NEG) = \sum \Delta LnS = \sum \min(\Delta LnSj, 0)$$

So, changes are made in Equation (2) to get:

$$\Delta LnFI_t = \beta o + \sum\beta_{1,k}\Delta LnFI_{t-k} + \sum\beta_{2,k}\Delta LnALB_{t-k} + \sum\beta_{3,k}\Delta WOMAN_{t-k}$$

$$+\ \sum\beta_{4,k}\Delta POS_{t-k}\ +\ \sum\beta_{5k}NEG_{t-k} + \lambda_1 LnFI_t + \lambda_2 LnALB_t + \lambda 3 Ln\ WOMAN_t$$

$$+\ \lambda 4 LnPOS_{t-k}\ +\ \lambda 5 LnNEG_{t-k}\ +\ \varepsilon_\tau \qquad (3)$$

In Equation (3), the null hypothesis for no cointegration is $\emptyset 1 = \emptyset 2 = \emptyset 3 = 0$ is checked by using of F test. If the co-integration is recognized then it refers that the modification shadow economy has effects that are symmetric. Moreover, effects are found to be asymmetric in the longer run. Short-run and long-run symmetry are compared.

4. RESULT

Table 1, the estimation of the ARDL models that include nonlinear and linear functions that are shown for each of the Balkan economies. Also, the ADF test has been applied to exhibit the stationarity of the variables at the second difference.

By negating the presence of variables related to I(2), the estimation of the model ARDL is as follows. We followed Hajilee, et al. (2015). The results derived from each optimal linear model are

represented in Table 2 and whereas Table 5 presents the results derived from the model that is non-linear. Tables 3 and 6 represent the diagnostic statistics for the models opted for. In addition, while accounting the estimates of the short-run coefficients for only the shadow economy, coefficients that are normalized for long-run are stated for the variables.

Table 1: Shadow Economy and Outreach of Financial Institutions on the Financial Inclusion (Coefficients for Shorter Run by Linear Models)

Country	Benchmark $\Delta lnSt$	1 $\Delta lnSt_{-1}$	2 $\Delta ln St_{-2}$	3 $\Delta ln St_{-3}$	Benchmark $\Delta lnALBt$	1 $\Delta lnALBt_{-1}$	2 $\Delta lnALBt_{-2}$	3 $\Delta lnALBt_{-3}$	Benchmark $\Delta lnWOMANt$	1 $\Delta WOMANt_{-1}$	2 $\Delta WOMANt_{-2}$	3 $\Delta WOMANt_{-3}$
Bulgaria	-0.477**				-1.407	-	-		5.841***	-	-	-
Croatia	-1.902	-0.124	2.100**	-	0.995	-0.919*			-3.202**	-0.121	-1.023	1.341
Kosovo	2.012**	-	-2.981***	3.971*	0.703*	-	-	-0.688	5.989***	-	-	-
Macedonia	-7.032***	-	-	-	0.234**	-0.558	-	-0.690**	-0.688	0.610	-	-
Romania	-0.148	1.222	1.731	-1.281	2.160*	0.610	-	-	0.801*	-	-	-
Albania	1.075	0.881	-0.821	1.213*	-0.558	0.513	1.541*	2.300**	0.422**	-	-	-

*** illustrates the significance level at 1%, ** illustrates the significance level at 5%, * illustrates the significance level at 10% respectively. The results estimated from Equation (2) (shorter-run nonlinear model estimated equation) are shown above.

Table 2: Estimated Coefficients of Financial Market Inclusion Determinants for the Linear Models in the Long Run

Country	Coefficients			
	Constant	LS	LALB	LWOMAN
Bulgaria	-17.008***	-6.269**	1.915***	0.599
Croatia	-64.449	-12.946	2.009	-2.889
Kosovo	-29.243*	5.051	0.934***	4.503***
Macedonia	-15.207	2.071	0.602**	1.544**
Romania	44.25**	-12.600***	0.526	0.954
Albania	-0.078***	-3.573***	0.509***	0.205*

*** illustrates the significance level at 1%, ** illustrates the significance level at 5%, * illustrates the significance level at 10% respectively. Estimated results from Equation (1) (long-run nonlinear model estimated equation).

Table 3: Models for the Linear Financial Inclusion

Country	Statistics (F)	ECM_{t-1}	Lag range Assessment for Multiplier	Ramsey Specification Test	Test for Normality	CUSUM Stability Test	CUSUM SQ Stability test	Adjusted R^2
Bulgaria	11.131	-0.828*	2.005	6.769	4.119	S	S	0.91
Croatia	3.100	-0.052***	14.857	7.973	18.439	S	S	0.92
Kosovo	2.229	-0.723***	12.129	2.111	0.185	S	S	0.74
Macedonia	8.627 -	-0.337***	6.980	6.189	0.645	S	US	0.85
Romania	7.932	-0.771***	4.634	0.442	1.495	S	S	0.95
Albania	12.124	-0.728*	4.001	6.439	4.459	S	S	0.89

***, **, * show the significance at 1%, 5% and 10% respectively. Following Pesaran, Shin, and Smith (2001), the value for critical value at the upper side for F-statistics at 5% significance level is 3.52. Lagrange multiplier test shows the serial correlation. Critical value at 5% significance level is 3.84. On the basis of test of kurtosis and skewness, the normality test has been conducted for which critical value at 5% significance level is 5.99. ECM is the error correction model whereas S represents stable whereas US represents unstable.

Table 3 indicates that the short-run estimate in the above sample study has at least one estimated considerable coefficient. This shows that the shadow economy and outreach of financial institutions have effects which are short run on the Balkan Countries. Table 2 illustrates the long-run coefficients which are negative for the countries mentioned depict that shadow banking and outreach of financial

institutions have negative effects on financial inclusion. It is noted that the estimated coefficient for the Macedonia, Kosovo, and Croatia is not significant in the long run for the shadow economy. For ALB, Croatia and Romania are found to have insignificant estimated coefficients in the long run. For women, Bulgaria, Romania, and Croatia are found to have insignificant coefficients. Long-run estimates are valid only if co-integration is established. Table 4 illustrates the other diagnostic statistics and Pesaran et al. (2001) F test where F is found to have a critical value larger than the upper range of 3.77. The next step includes the replacement of the lagged level variables in equation 2 by ECM_{t-1}which is linear combination thus imposed the lag structure that is optimal. The negative coefficient depicts the variables modification towards the long-run values and affirms co-integration. The estimated coefficients shown in Table 4 show the adjustments done in a quarter. Numerous additional diagnostics are shown in Table 4.First order autocorrelation is tested by LM statistic. Ramsey Regression equation specification error test (RESET test) reports the misspecification. The critical value is 3.84 which implies that models are correctly specified. CUSUM (CUS) is the cumulative sum control chart. CUSUMSQ (represented by CUS2) tests to launch constancy of estimates of short and long run. 'S' is used to denote stable models whereas 'U' is used to denote unstable models. Subsequently value of adjusted R^2 as the determination coefficient in the model is used to test the goodness of the fit. Tables 4, 5, and 6 reflect the anticipated outcomes, where Table 4 accounting for and representing the shorter run estimates and Table 5 accounting for and representing the long-run estimates.

Table 4: Estimated Coefficients for the Non-linear ARDL Models for Financial Inclusion

Country	Benchmark ΔPOS_t	$1\Delta POS_{t-1}$	$2\Delta POS_{t-2}$	$3\Delta POS_{t-3}$	Benchmark ΔNEG_t	$1\Delta NEG_{t-1}$	$2\Delta NEG_{t-2}$	$3\Delta NEG_{t-3}$
Bulgaria	29.943	-11.510*						
Croatia	-40.052**	-14.692	13.294	17.912	25.687*	-25.794	-46.211**	-55.233**
Kosovo	-9.164**	-4.389*	-5.224**	-6.024**	7.023***			
Macedonia	-3.944	-	-37.064**		57.301***	56.216***	11.835	37.589
Romania	17.047*				3.818	-37.992***		
Albania	-10.908*	-4.317			7.903*	25.616***	9.559*	

***, **, * show the significance at 1%, 5% and 10% respectively. Results estimated for equation number 4 (Short-run estimation for nonlinear model).

Table 5: Estimated Coefficients for the Financial Market Inclusion in the Long Run for Non-linear ARDL Models

Country	Constant	LALB	LWOMAN	Positive (POS)	NEGATIVE (NEG)
Bulgaria	-2.870	0.716*	-0.252	15.279*	4.739
Croatia	-2.870	0.716*	-0.252	15.279*	4.739
Kosovo	4.182	0.623*	1.035**	-7.424	-28.850***
Macedonia	4.003	0.139	-0.407**	1.598	-2.712
Romania	-2.335	1.656**	-1.855**	0.966	2.360
Albania	-12.664	1.181***	1.389*	-9.219	

***, **, ** show the significance at 1%, 5% and 10% respectively. The results estimated from Equation (1), integrating Equation (3).

The nonlinear ARDL model estimates and summary derived on the basis of equation 3 are detailed in Tables 4, 5 and 6.   Table 4 reports the short-run estimates to exchange rate changes either positive or negative variables bringing at least one significant coefficient.   Table 5 indicates the long-run estimates for the significantly positive variables for most countries. Table 6 concludes the

outcomes of test statistics by providing more conservative results. We can depend on the importance of ECM, which is significantly negative in all models, entailing the long-run equilibrium values of the mutually interacting variables.

Table 6: Characteristics Statistics for Nonlinear Financial Inclusion Models

Country	Statistics (F)	ECM_{t-1}	LM Test	RESET Test	Test for Normality	CUSUM Stability Test	CUSUM SQ Stability Test	Wald S Test	Wald L Test	Adjusted R^2
Bulgaria	3.459*	-0.906*	1.480	3.005	0.278	S	S	2.773	0.097	0.59
Croatia	4.906	-0.182	24.235	1.009*	0.373	S	US	2.992	17.009*	0.84
Kosovo	2.691	-0.869*	6.893	3.020*	1.675	S	S	3.861**	1.222	0.54
Macedonia	2.269	-0.478*	0.605	215.801		US	S	1.105	0.057	0.31
Romania	11.27*	-0.631*	16.693	0.796*	0.316	S	S	7.923*	1.032	0.96
Albania	4.654*	-0.030*	0.219	0.509	3.615	S	S	4.218	11.728***	0.68

According to Pesaranet. al (2001), the table above illustrates the exogenous variables. The F-test upper bound critical value is 3.77 and 4.35. LM is the abbreviation used for the lag range multiplier test. The critical values are used for the wald test. RESET is Ramsey's test for any misspecification.

For most of the models, LM and RESET stand unsubstantial showing constant estimations through CUSUM and CUSUMSQ and a good fit for most of the models. Three categories of asymmetry acknowledged by Shin et al. (2014); including adjustment asymmetry is arbitrated by analyzing the change over the period of short-run factors associated with a positive and negative change in variables. These tracks are dissimilar in all of the six economies studied; sustaining asymmetrical adjustment. The second category of asymmetry is also linked to short run and is called impact asymmetry to estimate short-run variations. Though in the majority of the economies and countries under study it was observed that short-run estimates vary in magnitude, direction and statistical significance, Shin et al. (2014) advocated using the Wald test to establish if the cumulative effect of short-run multipliers linked to the positive change is unlike the same cumulative effect of negative change.

5. CONCLUSION

Inclusion financially is often supposed to have the most imperative function in financial market expansion progression. In the last decade, Balkan economies seem to have exasperated to improve the concentration of the financial inclusion and incorporate the international financial market into their local financial system and consequently accomplish superior growth economically. Unluckily, there has been observed slight concentration given to the acceptance of established financial inclusion, particularly, how the shadow economy and financial outreach affect the financial inclusion. The present study checks and measures the intensity and magnitude of influence that shadow economy creates on financial inclusion on the one side, and on the other side it also measures and estimates and test empirically that how the financial outreach affects financial inclusion in the six selected economies for the purpose of this study. To attain the objectives of the study time frame of 2011-2017 was taken for data collection and analysis. The asymmetrical co-integration approach is used, which commences non-linearity in the specification of the model. The contemporary nonlinear approach co-integration (i.e., NARDL) is used. The results of the study recommend that for Balkan countries it is highly significant to manage and control the issue of financial inclusion alongside the shadow

economy size-related challenges. It requires extensive review of current and prospective reform programs that may create right use and allocation of financial services products. It may lead to income equality and poverty alleviation. Moreover the strategy formulation agencies in these countries need to eradicate obstruction to such financial inclusion through quality accessibility of financial services products in a sufficient way. This will bring into stream those deprived and economically omitted firms and households that were previously somehow unable to contribute to the economic development. This inclusion, as a result, will enhance development of financial markets and economy leading to overall development of such emerging economies.

6. AVAILABILITY OF DATA AND MATERIAL

Data can be made available by contacting the corresponding authors

7. REFERENCES

[1] Ahamed, M. M., &Mallick, S. K. (2017). Is financial inclusion good for bank stability? International evidence. *Journal of Economic Behavior & Organization*.

[2] Ahumada, H., Alvaredo, F., & Canavese, A. (2009). The monetary method to measure the size of the shadow economy: A critical examination of its use. *Revue économique, 60*, 1069-1078. DOI:10.3917/reco.605.1069.

[3] Allen, F., Carletti, E., Cull, R., Senbet, L., Valenzuela, P., 2014. African financial development and financial inclusion gaps. Journal of African Economies 23, 614-642.

[4] Bayar, Y., &Ozturk, O. F. (2016). Financial development and shadow economy in European Union transition economies. *Managing Global Transitions: International Research Journal, 14*(2), 157-173.

[5] Berrittella, M. (2015). The effect of public education expenditure on shadow economy: A cross-country analysis. *International Economic Journal, 29*(4), 527-546.

[6] Chortareas, G., Magkonis, G., Moschos, D., &Panagiotidis, T. (2015). Financial development and economic activity in advanced and developing open economies: Evidence from panel cointegration. *Review ofDevelopment Economics, 19*(1), 163-177.

[7] Cull, R., Demirgu¨c_-Kunt, A., & Morduch, J. (2007). Financial performance and outreach: A global analysis of lending microbanks. The Economic Journal, 117(1), F107–F133.

[8] Cull, R., Demirgu¨c_-Kunt, A., & Morduch, J. (2009). Microfinance meets the market. Journal of Economic Perspectives, 23(1), 167–192.

[9] Dreher, A., Schneider, F., 2010. Corruption and the shadow economy: An empirical analysis. Public Choice 144, 215–238.

[10] Elgin, C., & Schneider, F. (2016). Shadow economies in OECD countries: DGE vs. MIMIC approaches. *Bogazici Journal: Review of Social, Economic & Administrative Studies, 30*(1), 1-32.

[11] Gërxhani, K. (2004). The informal sector in developed and less developed countries: A literature survey. Public Choice 120, 267–300.

[12] Goel, R. K., & Nelson, M. A. (2016). Shining a light on the shadows: Identifying robust determinants of the shadow economy. *Economic Modelling*, *58*, 351-364.

[13] Hajilee, M., Al-Nasser, O. M., & Perez, G. H. (2015). Banking sector development and interest rate volatility in emerging economies. *Applied Economics, 47*, 1739-1747. DOI: 10.1080/00036846.2014.1000520.

[14]   Hajilee, M., Stringer, D. Y., &Metghalchi, M. (2017). Financial market inclusion, shadow economy and economic growth: New evidence from emerging economies. *The Quarterly Review of Economics and Finance*, *66*, 149-158.

[15]   Hartarska, V., &Nadolnyak, D. (2007). Do regulated microfinance institutions achieve better sustainability and outreach: Cross-country evidence. Applied Economics, 39(10), 1207–1222.

[16]   Hashemi, S., & Rosenberg, R. (2006). Graduating the poor into mircofinance: Linking safety nets and financial services. Focus note No. 34, Washington, DC: CGAP.

[17]   Hermes, N., Lensink, R., &Meesters, A. (2011). Outreach and efficiency of microfinance institutions. *World development*, *39*(6), 938-948.

[18]   Isern, J., &Porteous, D. (2005). Commercial banks and microfinance: Evolving models of success. Focus Note No. 28, Washington, DC: CGAP.

[19]   Kapoor, M., Ravi, S., & Morduch, J. (2007). From microfinance to mfinance. Innovations: Technology, Governance. Globalization, 2(1–2), 82–90.

[20]   Lapenu, C., & Zeller, M. (2002). Distribution, growth, and performance of the microfinance institutions in Africa, Asia and Latin America: A recent inventory. Savings and Development, 26(1), 87–111.

[21]   Markellos, R. N., Psychoyios, D., & Schneider, F. (2016). Sovereign debt markets in light of the shadow economy. *European Journal of Operational Research, 252*(1), 220-231. DOI: 10.1016/j.ejor.2015.12.039.

[22]   Olivares-Polanco, F. (2005). Commercializing microfinance and deepening outreach: Empirical evidence from Latin America. Journal of Microfinance, 7(1), 47–69.

[23]   Paxton, J., & Cuevas, C. (2002). Outreach and sustainability of member based rural financial intermediaries. In M. Zeller, & R. L. Meyer (Eds.), The triangle of microfinance. Financial sustainability, outreach, and impact. Baltimore and London: Johns Hopkins University Press.

[24]   Pesaran, M. H., Y. Shin, & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16, 289-326.*

[25]   Restrepo-Echavarria, P. (2015). Measuring underground economy can be done, but it is difficult. *The Regional Economist, 1/2015*, 10-11.

[26]   Rhyne, E., & Otero, E. (2006). Microfinance through the next decade: Visioning the who, what where, when and how. Paper commissioned by the Global Microcredit Summit 2006. Boston, MA: ACCION International.

[27]   Rhyne, E., & Otero, E. (2006). Microfinance through the next decade: Visioning the who, what where, when and how. Paper commissioned by the Global Microcredit Summit 2006. Boston, MA: ACCION International.

[28]   Schneider, F. (2012). The shadow economy and work in the shadow: What do we (not) know?" IZA Discussion Paper No. 6423.

[29]   Schneider, F., Buehn, A., Montenegro, C. E. (2010a). Shadow economies all over the world: New estimates for 162 countries from 1999 to 2007. The World Bank Development Research Group Poverty and Inequality Team & Europe and Central Asia Region Human Development Economics Unit July 2010. Policy Research Working Paper 5356.

[30]   Schneider, F., Buehn, A., Montenegro, C.E. (2010b). New estimates for shadow economies all over the world. Int. Econ. J. 24, 443–461.

[31]   Schneider, F., Enste, D.H. (2000). Shadow economies around the world: Size, causes, and consequences. J. Econ. Lit. 38, 77–114.

[32]   Shin, Y., Yu, B., & Greenwood-Nimmo, M. J. (2014). Modelling asymmetric cointegration and dynamic multipliers in a nonlinear ARDL framework. In W. C. Horrace& R. C. Sickles (Eds.), *Festschrift*

inHonor of Peter Schmidt: Econometric Methods and Applications (pp. 281-314). New York: Springer Science & Business Media.

Dr. Qaisar Ali Malik is an Associate Professor at Foundation University. He received his M.Phil and PhD from the same university. His core theoretical, professional and practical interests are in the areas of Financial Reporting & Analysis, Cost Management & Analysis and Corporate Finance Decisions.

Hina Affandi is a PhD Scholar at Faculty of Management Sciences, Foundation University Islamabad Pakistan. Her interest is in Financial Management, Micro Finance, Behavioral Finance and Analysis of Financial Statements.