€ 13,00 (i.i.)

www.mheducation.it

ISSN: 1722-4241

Vol. 23 No. 1

Global & Local Economic Review 2019

McGraw-Hill Education

Global & Local Economic Review

Volume 23 No.1 2019

Mc Graw Hill

POLICY FOR THE SUBMISSION OF MANUSCRIPTS TO BE PUBLISHED IN GLOBAL & LOCAL ECONOMIC REVIEW

1. PRELIMINARY INSTRUCTIONS

For a manuscript to be accepted for publication in the Review, authors are required to abide by the following publication rules. In particular, authors must state that:

- the manuscript, or relevant parts of the manuscripts, was not previously published;
- the manuscript is not simultaneously under review by any other journal;
- the manuscript will be not submitted elsewhere before the final outcome of peer-reviewing process by the Scientific Board.

2. MANUSCRIPTS SUBMISSION

Manuscripts must be submitted to the Editorial Secretary by e-mail: gler@fondazionepescarabruzzo.it.

Manuscripts must be submitted following the instructions for authors (see http://www.gler.it/) and should include the main text, any footnotes, references, an Abstract not longer than 300 words, and one or more JEL codes available at https://www.aeaweb.org/econlit/jelCodes.php.

It is the author's responsibility to ensure that manuscripts are written in clear and comprehensible English.

Author's institutional affiliation, telephone number, and the e-mail address should be placed on the first page of the manuscript (the same applies to the corresponding author in case of co-authorship).

3. REVIEWING PROCESS

The manuscript is reviewed by the Scientific Board and, if judged suitable for publication in the Review, is then sent to three referees for a rigorous blind peer-reviewing process.

- The initial decision by the Scientific Board takes 2 weeks.
- Authors will be informed of the review decision and all relevant comments by the three referees within approximately a month.

Based on the referees' recommendations, the Scientific Board then decides whether the manuscript should be accepted as it is, revised and resubmitted, or rejected. In any case, authors will be provided with constructive feedback.

In case of acceptance, the publication process will begin by assigning the manuscript to a number and a year of the Review.

Proof corrections and the printing process takes approximately one month.

4. MISCELLANEOUS

In the event it becomes necessary in the future, authors submitting manuscripts to the Review are expected to be available for contributing as referees. The articles published in Global & Local Economic Review are listed in EconLit and eJEL bibliographies (American Economic Association).

Global & Local Economic Review

«Global & Local Economic Review» is included in JEL on CD, e-JEL and Econlit, the electronic indexing and abstracting service of the American Economic Association

Editorial Offices: Corso Umberto I, n. 83 - 65122 Pescara
Tel. +39 0854219109 – Fax +39 0854219380
Website: www.gler.it
E-mail: gler@fondazionepescarabruzzo.it

McGraw-Hill Education (Italy), S.r.l.
Via Ripamonti, 89 – 20141 Milano
Tel. 02535718.1

Senior Portfolio Manager B&E: Marta Colnago
Portfolio Manager Custom: Daniele Bonanno
Produzione: Victoria Garcia Daganzo
Stampa: Logo srl, Borgoricco (PD)

McGraw-Hill Education (Italy), 2019
Printed in Italy
ISSN (print) 1722-4241 - ISSN (online) 1974-5125

Global & Local Economic Review

Volume 23 No. 1 **2019**

TABLE OF CONTENTS

G. & L. E. R., Vol. 23 No. 1, 2019

Wajid Ali*, Rabia Manzoor, Muhsin Ali, Zeshan Khan and Manzoor Ahmed

DO REMITTANCES MATTER FOR OUTPUT GROWTH VOLATILITY? GLOBAL EVIDENCE

Abstract

The paper empirically investigates the potential impacts of institutional and noninstitutional determinants on output growth volatility for thirty-four economies over the period 1985-2012. We analyze noninstitutional determinants, such as remittances, financial development, and trade openness. Institutional determinants of output growth volatility comprise a presidential system, discretionary public policy, and political constraints. For empirical estimation, two types of estimation techniques are used, namely, 1) conventional methods of fixed effects, random effects, and GMM and 2) the common correlated effects mean group and pooled mean group method developed by (Peseran, 2006). The study shows that remittances, financial development and discretionary government spending (institutional determinant) have a significant role in smoothing output volatility in the short and long runs. Moreover, political constraints have a significant positive role in smoothing output volatility in the long run.

JEL CLASSIFICATION: A10, F10
KEYWORDS: Remittances, panel data analysis, output growth

* The first author is associated with the Sustainable Development Policy Institute Islamabad, while the second and third authors are PhD scholars at the Pakistan Institute of Development Economics Islamabad and Tsinghua University China.

1. Introduction

Output growth volatility has received great attention among economists and policy makers in light of the evidence that it has negative effects on growth, poverty and welfare, especially in developing countries. This interest has further increased since it was found that the growth effects of output growth volatility differ in emerging and developing countries. Volatility in economies is mostly driven by country-specific factors, such as financial development, institutional quality, trade and financial openness (IMF 2005). Therefore, there is dire need to identify the factors affecting output growth volatility.

Most of the existing studies find that remittances have been on the rise for the past several decades and have become an important earnings source for many recipient economies (especially for developing economies[1]), surpassing their foreign direct investment (FDI) and foreign export earnings.

The officially recorded inflows of migrant remittances to developing economies were estimated to be $435 billion in 2014 and were expected to increase (World Bank, 2015). Moreover, remittances have been observed to be a stable source of income and remarkably resilient during economic slumps relative to FDI, foreign aid and capital flows (Chami et al., 2012; Ahmad et al., 2013 and Ratha, 2003). When the home country is experiencing recessionary trends, remittances increase because migrant laborers send more money to support their family members (Orozco, 2003). Hence, remittances smooth out fluctuations in consumption and investment that ultimately eliminate output volatility and thus lead to macroeconomic stability in the recipient country (Bugamelli & Paterno, 2011).

Output growth volatility has an adverse impact on output growth, poverty and welfare, particularly in emerging economies (Ramey & Ramey, 1995; Loayz, 2007; Bugamelli & Paterno, 2011). Output volatility has a negative link through various kinds of uncertainties, such as political, economic and policy uncertainties (Loayza, 2007). The negative link between volatility and growth was first documented by (Ramey & Ramey, 1995) and further explored by (Acemoglu et al. 2003; Fatas, 2002; Hnatkovska & Loayza, 2005). They found that output volatility has an adverse welfare effect through reducing output growth. The adverse welfare effect is more substantial in countries that are institutionally weak, financially

[1] 75 percent of the total remittances are channeled to under-developed economies; see also (Coronado, 2009).

underdeveloped and not able to exercise countercyclical policies. Output volatility received much more consideration once it was linked with "globalization" variables, such as international trade and financial integration (Kose et al. 2006).

Knowing the factor determining output growth volatility has become an essential question for researchers. To date, researchers have focused on highlighting the role of institutional quality, financial development and trade openness in explaining output growth volatility. However, the role of the essential component of migrant "remittances" is not properly highlighted. The purpose of this study is to analyze the role of institutional factors, such as the presidential system, discretionary public policy and political constraints, and noninstitutional factors, such as financial development, remittances, and trade openness, on output growth volatility, in the context of 34 global economies.

2. Data Specification and Methodology

2.1. Data Specification

This study uses panel data from 34 global economies. The selection of these countries is purely based on the data availability over the period 1985-2012. Panel data have many advantages over traditional time-series and cross-sectional data (Hsiao, 2014). Panel data consist of a large number of data points, therefore providing a sufficient number of degrees of freedom and reducing the possibility of multicollinearity among the explanatory variables. Thus, panel data offer efficient parameter estimates (Hsiao, 2014).

Researchers usually use narrow money (M1), broad money (M2) and liquid liabilities (M3) to proxy financial depth (Arestis*et al.* 1997 & Odhiambo 2009). However, (Gregorio & Guidotti 1995) consider narrow money a poor indicator of financial development. Contrarily, (King & Levine, 2000) propose bank credit provided to the private sector as a proportion of GDP as a standard indicator of financial development. Trade openness is measured by the sum of export and import as a share of GDP. Data for remittances, financial development and trade openness are extracted from the World Development Indicators (WDI) in the World Bank database. Moreover, the data on the presidential system are taken from the Database of Political Institutions (DPI) of the World Bank. The data on the variable political constraints are taken from the database of the Political Constraint

Index[2]. The data on discretionary public spending are not readily available, so this variable is calculated by estimating the fiscal rule model (Fatas & Mihov, 2003).

To determine the output volatility (GDP growth), a moving average standard deviation approach (Fatas & Mihov, 2003, 2006 & Eller et al. 2012) is applied as follows.

$$\sigma_{it} = \sqrt{\frac{\sum(Y_{it} - \bar{Y})^2}{n}}$$

In equation (1), σ_{it} indicates output volatility, and the subscripts i and t represent the country index and time period, respectively. $Y_{it}$is the current year output growth for country i in period t. $\bar{Y}$ is the average of 3-year output growth. The complete model is specified as follows:

Output volatility = f (remittances, financial development, trade openness, presidential system, discretionary public policy and political constraints)[3].

$$\sigma_{it} = \beta_{\circ} + \beta_1 \mathrm{Rem}_{it} + \beta_2 \mathrm{FinD}_{it} + \beta_3 \mathrm{TrdO}_{it} + \beta_4 \mathrm{PrS}_{it} + \beta_5 \mathrm{DisP}_{it} + \beta_6 \mathrm{POlC}_{it} + \mathrm{U}_{it}$$

where Rem, Fin, TrdO, PrS, DisP, and POlC are the respective abbreviations of remittances, financial development, trade openness, presidential system, discretionary public policy and political constraints.

2.2. *Research Methodology*

2.2.1. Panel Co-Integration Test

After determining the order of integration of series, the next step is to test whether there exists a long-run relationship among the variables. Among the various alternative panel cointegration tests, the (Pedroni, 1995) test is most popular because of its heterogeneous nature varying through each member of the sample. Cross-sectional dependencies are as follows.

[2] See Appendix for detailed definitions of variables.

[3] The selection of explanatory variables is based on earlier studies. Presidential system is captured through a d**u**mmy variable receiving the value 1 when a country has a presidential system and 0 otherwise.

Please leave one line clear between paragraphs (single spacing should be used). Footnotes are to be used only for substantive observations.

$$\Delta Y_{it} = \alpha_i + \delta_{it} + \Delta Y_{i,t-p} + \varepsilon$$

The null hypothesis for the (Pedroni, 1995) test is that $H_0: \widehat{\rho_l} = 1$, where $\widehat{\rho_l}$ is the estimated autoregressive coefficient of the residuals in the ith unit.

The Pedroni test is designed to test only the existence of cointegration. The residual-based test of Pedroni (1995) has the limitation that it does not account for cross-country dependence. Therefore, we use the panel ARDL test of cointegration proposed by Pesaran et al. (1997, 2004). In the first step, this test explores the possible cointegration among all variables, and in the second step, the long-run relationship is estimated. The validity of the cross-section dependencies is tested by the (Hausman, 1978) test using the maximum likelihood estimate. The mean group (MG) and pooled mean group (PMG) estimators are superior to dynamic ordinary least squares (DOLS) and fully modified ordinary least squares (FMOLS) because the PMG accounts for the long-run homogeneity among the variables under consideration. This technique is used by (Binder & Offermanns, 2007) to examine the purchasing power parity in Europe and by (Bildirici, & Kavikci, 2012a,b) to analyze the relationship between electricity consumption and economic growth.

The conventional pooled estimators (such as fixed effect, random effects, instrumental variables and GMM) are appropriate only when all the cross sections, in general, are homogenous. However, in the case of large N and T (N is cross sections, and T is time period), the homogeneity assumption of the slope coefficient is often not valid because the slope coefficient is correlated with the error term, and unobserved shocks in each country are correlated with explanatory variables. The static panel data estimators are also inconsistent because of serial correlation (we include lags of the dependent variable) and because of heteroskedasticity. We also estimate equation (1) by system GMM, as the explanatory variables and error term are related because of the elimination of fixed effects from equation (1). To enhance the robustness of results and to tackle diverse econometric issues, the system GMM, MG and PMG results are chosen for analysis. GMM has the advantage of dealing with the problems of endogeneity and country-specific fixed effects very successfully. However, it is incapable of tackling the problem of cross-sectional dependencies (assuming that each country is

homogenous), hence producing inconsistent results (Pesaran & Smith, 1995). To address the problem of heterogeneous slopes, (Pesaran, Shin & Smith, 1995) suggested the mean group (MG) model. The MG estimators estimate the long-run parameter of the panel through ARDL by averaging each country's parameters. Suppose we have the following ARDL model:

$$Y_t = \alpha_i + \gamma_i Y_{i,t-1} + \beta_i X_{it} + \varepsilon_{it}$$

where i and t represent the country and time, respectively.

Similarly, the whole panel MG parameter is given by

$$\hat{\theta} = \frac{1}{N}\sum_{i=1}^{N} \theta_i$$

$$\hat{a} = \frac{1}{N}\sum_{i=1}^{N} a_i$$

The above equations do not restrict the coefficients but allow them to vary and to be heterogeneous in both the short and long runs. Nevertheless, the above estimator will give a consistent and valid estimate only in the case of long time series data. The pooled mean group (PMG) is an alternative estimator that can capture country-specific characteristics, such as institutional arrangements, patterns of trade and political developments, etc. This estimator allows the intercept, short-run coefficients, and error variances to differ freely across groups, but the long-run coefficients are assumed to be constant.

This technique permits the intercept, short-run coefficients, and error variances to vary spontaneously throughout the clusters and is therefore used to capture the long-run and the short-run relationships between the business cycle (measured by the three-year moving average standard deviation of the GDP growth) and the explanatory variables that affect output volatility. Moreover, the dynamic relationships between dependent and independent variables are examined first by ARDL (p, q) and next by the mean group (MG) estimator introduced by Pesaran and Smith (1995) and pooled mean group (PMG) estimator originated by (Pesaran et al. 1999). Following (Loayza & Ranciere, 2006), the ARDL model is specified as follows:

$$Y_{it} = \sum_{j=1}^{p-1} \gamma_y^i (y_i)_{t-j} + \sum_{j=0}^{q-1} \delta_y^i (X_i)_{t-j} + \varphi^i (y)_{it-1} + \mu_i + \varepsilon_{it}$$

where $X_{i,t-j}$ and μ_i represent the vector of explanatory variables and the fixed effect, respectively. Generally, the panel may be unbalanced, which makes the p and q vary across countries. Then, the ARDL model in the vector error correction form is specified as follows:

$$\Delta Y_{it} = \theta_i \left(Y_{i,t-1} - \beta_i X_{i,t-1}\right) + \sum_{j=1}^{p-1} \gamma_y^i \Delta Y_{i,t-j} + \sum_{j=0}^{q-1} \delta_y^i \Delta (X_i)_{t-j} + \mu_i + \varepsilon_{it}$$

where β_i and θ_i are the long-run and the adjustment parameters, respectively. The pooled mean group restricts the long-run elements to be common across countries:

$$\Delta y_{it} = \theta_i \left(Y_{i,t-1} - \beta_i X_{i,t-1}\right) + \sum_{j=1}^{p-1} \gamma_y^i \Delta (Y_i)_{t-j} + \sum_{j=0}^{q-1} \delta_y^i \Delta (X_i)_{t-j} + \mu_i + \varepsilon_{it}$$

where y, X, γ, δ, θ, β, i and t represent the output volatility, the vector of independent variables, the short-run coefficients of the dependent and independent variables, the long-run coefficients, the coefficient of the speed of adjustment, the country and time, respectively. Equation (6) can be estimated by maximum likelihood estimations using either the mean group or the pooled mean group estimators, both of which account for long-run equilibrium and the dynamic adjustment process (Demetriades & Law, 2006).

For validity, consistency, and efficiency, the series under consideration must be correlated in the long run. The PMG estimate assumes that the exogenous variables are nonstochastic and that the residuals obtained from the error correction model are serially uncorrelated. This estimator is especially appropriate when the long-run equilibrium relationships between variables are similar across countries. The short-run adjustment relationships

and the slope coefficients among individual countries are allowed to be country specific. This is because all developed countries might have the same economic structure, but each country might have a different approach in tackling economic and noneconomic shocks. Failing these conditions will lead to unreliable results of the PMG.

3. Empirical results

3.1. Unit root test

Our data set may suffer from unit root problems because we have a large time span. Therefore, we first work with different panel unit root tests (Levin Lin & Chu, 2002; Maddala & Wu, 1999 and Im, Pesaran & Shin, 1997) to determine the order of integration. For ARDL, the prerequisite is that some of the series should be I(1) and some I(0) (Pesaran & Smith, 1995; Pesaran, 1997; Pesaran et al., 1999). The results of different panel unit root tests presented in Table 1 inform us about the order of integration of the series. From Table 1, we can observe that some of the series are I(0), while others are I(1), which indicates that ARDL is an appropriate technique to be used for empirical analysis (Pesaran, Shin, & Smith, 2001).

Table 1. Panel Unit Root Test Result

Variables	Level			First Difference		
	LLC	IPS	MW	LLC	IPS	MW
GDP growth	-1.07 [0.12]	-4.62 [0.00]	51.80 [0.81]	-8.35 [0.00]	-5.09 [0.00]	182.87 [0.00]
Remittances	-1.35 [0.16]	-3.54 [0.00]	14.77 [0.51]	-5.09 [0.00]	-6.49 [0.00]	267.47 [0.00]
Political Constraints	-13.39 [0.00]	-3.45 [0.00]	50.93 [0.84]	-6.49 [0.00]	-6.81 [0.00]	56.24 [0.08]
Presidential System	-6.72 [0.00]	-2.26 [0.04]	26.37 [0.04]	-7.07 [0.00]	-3.62 [0.07]	50.93 [0.04]
Trade Openness	-1.55 [0.21]	-2.46 [0.03]	80.55 [0.05]	-8.35 [0.00]	-7.68 [0.00]	119.23 [0.00]
Bureaucratic quality	-2.22 [0.06]	-1.41 [0.24]	31.46 [0.42]	-11.50 [0.06]	-4.14 [0.02]	65.45 [0.03]
Government Spending	-1.02 [0.23]	-1.37 [0.13]	31.46 [0.06]	-3.73 [0.04]	-3.19 [0.04]	79.86 [0.06]

Source: Author own calculations.

Values in brackets are the p-value, where values less than or equal to 0.10 indicate rejection of the null hypothesis, i.e., the p-value. There is unit root.

3.2. Evidence from short-run results

With the aim of ascertaining how remittances and other variables under consideration affect the output growth volatility, the short-run and long-run results from the error correction version of the ARDL (p, q) model are reported separately in table 2 and table 3 below.

In addition to the short-run (see table 2 for short-run results) and long-run (see table 3 for long-run results) results of the MG and PMG, the Hausman test results are provided to determine which estimator (MG or PMG) gives better results regarding efficiency and consistency. This test is based on the null hypothesis that the MG and PMG give equivalent results, and we will reject the null hypothesis of a homogenous coefficient if the probability value of the Hausman test is less than 5 percent (Pesaran *et al.*, 1996).

Comparing the coefficients of the MG and PMG, one should observe that the two estimators are considerably different.

The results displayed in Table 2 show the short-run impact of social and political variables (remittances, trade openness, presidential system, political constraints, bureaucratic quality, government spending and credit of banking sector to private sector) on reducing business cycle or output growth volatility. Since the Hausman test confirms that the PMG is more efficient and consistent than the MG, emphasis is given to the PMG results.

It is observed from the study results that remittances, political constraints, trade openness, government spending and financial development have a significant role in stabilizing the business cycle/output growth volatility. Bureaucratic quality and presidential system are not statistically significant under the MG estimator to reduce the business cycle in the short run, although the sign of bureaucratic quality follows the theoretical assumption. Similarly, under the PMG estimator, all the variables except for the presidential system significantly decrease the volatility of the business cycle.

Table 2. Baseline Results

Growth Rate Volatility Model	MG	PMG
Error Correction	-0.61 [-11.88]	-0.89 [-6.92]
ΔRemittances	-0.60 [-2.70]	-0.84 [-2.50]
ΔPolitical Constraints	0.56 [1.59]	0.77 [0.21]
ΔPresidential System	0.65 [0.44]	-1.62 [-1.38]
ΔTrade Openness	-0.157 [-11.94]	-0.81 [-6.73]
ΔBureaucratic quality	-0.39 [-1.70]	-0.55 [-8.09]
ΔGovernment Spending	-0.47 [-2.46]	-0.71 [-3.55]
ΔCredit	-0.48 [-5.14]	-0.504 [-3.52]
Constant	27.36 [19.14]	6.990 [0.721]
Hausman Test4	2.69 (0.74)	
Constant	27.36 [19.14]	

Notes: a): t-values are represented in brackets. b): STATA 13 is used for estimation purposes.

Remittances, the core variable of the study, are found to significantly smooth the business cycle under both the MG and PMG estimators, with the exception that under the PMG estimator, the smoothing power is greater than that under the MG estimator in both the short run (see table 2) and the long run (see table 3). A study by (Jidoud, 2015) with the objective of exploring the channels by which remittances affect business cycle volatility in African countries using a dynamic stochastic general equilibrium (DSGE) model also finds that remittances have a significant smoothing impact on business cycle volatility. Another study by Chami et al. (2010) finds that remittances play a stabilizing role in output growth volatility by employing cross-sectional OLS and GMM panel regression. Since remittances are a stable source of income

[4] The result shows that the null that the MG is more efficient than the PMG is rejected.

compared to foreign direct investment (FDI), they are more likely to stabilize the aggregate economic activity. Whenever the recipient country's macroeconomic situation worsens, migrant workers tend to increase their family income by transferring more money to their home countries (UNCTAD, 2006; World Bank, 2006a & b).

Discretionary government spending has a negative and significant impact on growth volatility both in the short run and in the long run, validating the argument that fiscal policy is effective. This argument also suggests that government spending has the capability to reduce output growth volatility both in the short run and in the long run. The theoretical relationship between trade openness and output volatility is uncertain. From one point of view, it is said that more volatility is caused by trade openness because trade openness leads to specialization (Tornell et al., 2003). However, several studies find that trade openness moderates country-specific shocks and hence smooths output volatility (Krebs, Krishna & Maloney, 2004). Our empirical findings suggest that trade openness significantly reduces output volatility both in the short run (see table 2) and in the long run (see table 3) under the MG and PMG estimators.

The development of the financial market (size of financial markets), especially of the credit market, plays an essential role in determining business cycle fluctuations and is therefore essential for understanding the dynamics of economies. In our case, the results show that financial market size and output volatility are negatively and significantly related. Financial market deepening considerably reduces the volatility of output motivated by variations in productivity. Our results are similar to those of Mendicino (2007), who used a DSG approach to explore how credit market size is related to business cycle variations.

Table 3. Evidence from Long-Run results

Variables	MG	PMG
Remittances	-0.27 [-2.51]	-0.41 [-2.66]
Political Constraints	0.52 [1.98]	0.64 [3.73]
Presidential System	-0.63 [-1.22]	0.86 [-2.69]
Trade Openness	-0.05 [-2.03]	-0.12 [-4.27]
Bureaucratic quality	-0.57 [-1.74]	0.036 [2.90]
Government Spending	-0.61 [-3.05]	-0.72 [-5.09]
Credit	-0.40 [-1.52]	-0.30 [-2.98]
Hausman Test5		2.69 (0.74)
Constant		6.990 [0.721]

Lastly, we consider three measures of institutions, bureaucratic quality, the (Henisz, 2000) Political Constraint Index (PCI) and the type of government (autocratic vs democratic), and their role in stabilizing output volatility. Our empirical results show that the Political Constraint Index has a positive and nonsignificant impact on growth volatility in the short run (see table 2), but in the long run (see table 3), the impact becomes significant but remains positive, thereby increasing the volatility of the business cycle whenever political constraints become prolonged. Empirically, the impact of the other two institutional variables, i.e., bureaucratic quality and type of government, is mixed. Bureaucratic quality in the short run (see table 2) has a negative impact on output growth volatility, but the impact is

[5] The result shows that the null that the MG is more efficient than the PMG is rejected.

nonsignificant under the MG estimator. Similarly, in the long run (see table 3) under the MG estimator, bureaucratic quality has a negative and nonsignificant impact on the business cycle, but under the PMG estimator, the two are positively and significantly related. Our finding that institutional variables dampen growth volatility is supported by (Acemoglu, 2002), who observes that "countries pursuing poor macroeconomic policies also have weak institutions".

4. Conclusion and Policy Recommendations

The current study involved a concerted effort to analyze the role of institutional factors, such as presidential system, discretionary public policy and political constraints, and noninstitutional factors, such as financial development, remittances, and trade openness, on output growth volatility in the context of 34 global economies.

The study finds that volatility is primarily caused by both institutional and noninstitutional factors. The primary reasons for high volatility in output growth in developing countries are unsustainable and distortionary macroeconomic policies. The study also determines the relationship between institutional vs. noninstitutional variables and economic growth volatility, which remains uncertain, as suggested by much theoretical and empirical literature. The results suggest that both institutional and macroeconomic variables determine the business cycle. The study used the amalgamation of conventional methods (fixed effects, random effects, and GMM) and the common correlated effects (mean group and pooled mean group methods) to analyze the relationship between institutional vs. noninstitutional factors and the business cycle. It is concluded from the empirical results that remittances as a percentage of GDP along with other variables, including credit to private sector and discretionary government spending, are significant in smoothing output volatility in both the short run and the long run. Institutional measures were also included in the output volatility model, and that political constraints were found not to have a significant role in smoothing output volatility in the short run. However, the impact is significantly positive in the long run, smoothing output growth volatility. The impact of the other two institutional variables, i.e., bureaucratic quality and type of government, is mixed, showing that institutional measures are essential in determining the business cycle.

The results of this study show that both institutional and noninstitutional factors are important in moderating output volatility. It is concluded from the

above discussion that macroeconomic policies, as well as institutional arrangement, are essential in determining business cycles.

References

Ahmed S., Levind A., Wilson B. (2004), *Recent U.S. macroeconomic stability: good policies, good practices, or good luck*, Review of economics and statistics, 86(3), 824-832.

Aghion P., Banerjee A. (2005), *Volatility and growth*. OUP Catalogue.

Acemoglu D., Johnson S., Robinson J.A., Y. Thaicharoen J.A. (2003), *Institutional Causes, Macroeconomics Symptoms: Volatility, Crises, and Growth*, Journal of Monetary Economics 50(l), 49-122.

Aizenman J., Marion N. P. (1993*), Policy uncertainty, persistence and growth*. Review of international economics, 1(2), 145-163.

Barrell R., Gottschalk S. (2004), *The volatility of the output gap in the G7*, National Institute Economic Review, 188(1), 100-107.

Bastourre D., Carrera J. (2004), *Could the exchange rate regime reduce macroeconomic volatility*, Conference paper.

Bejan M. (2006), *Trade openness and output volatility*, MPRA paper No 2759, University of Munich.

Bekaert G, Campbell H., Lundblad C. (2006), *Growth volatility and financial liberalization*, Journal of international money and finance, 25, 370-403.

Bleany M., Fielding D. (1999), *Exchange Rate Regimes, Inflation and Output Volatility in Developing Countries*, Centre for Research in Economic Development and International Trade Working paper 99/4, University of Nottingham.

Breen R., Garcia-Peñalosa C. (2005), *Income inequality and macroeconomic volatility: an empirical investigation*, Review of Development Economics, 9(3), 380-398.

Bugamelli M., Paterno F. (2011). *Output growth volatility and remittances*, Economica, 78(311), 480-500.

Bugamelli M., Paterno F. (2006), *Output volatility and remittances*, Working paper, Bank of Italy.

Buch C. M., Döpke J., Pierdzioch C. (2005), *Financial openness and business cycle a volatility*. Journal of International Money and Finance, 24(5), 744-765.

Cecchetti S., Flores-Lagunes A. Krause S. (2006), *Assessing the Sources of Changes in the Volatility of Real Growth*, NBER working paper 11946

Chami R., Hakura D., Montiel P. (2010), *Do Worker Remittances Reduce Output Volatility in Developing Countries?*, Journal of globalization and Development 3.1.

Denizer C., Iyigun M., Owen A. (2002), *Finance and macroeconomic volatility*, Contributions to macroeconomics, 2(1), 1-30.

Easterly W., Islam R., Stiglitz J. E. (2001) *Shaken and stirred: explaining growth volatility* In Annual World Bank conference on development economics, 191, 211.

Easterly W., Kraay A. (2000), *Small states, small problems: income, growth and volatility in small states*, World Development, 20(11), 2013-2027.

Engen E.M., Skinner J. (1992), *Fiscal policy and economic growth*, National Bureau of Economic Research, N. w4223.

Fatas A. (2002). *The effects of business cycles on growth*, Banco Central de Chile, Vol. 156.

Fatas A., Mihov I. (2003), *The Case for Restricting Fiscal Policy Discretion*, The Quarterly Journal of Economics, 118(4), 1419-1447.

Fatas A., Mihov, I. (2006), *Policy Volatility, Institutions and Economic Growth*. CEPR discussion paper no.5388.

Giovanni J., Levchenko A. (2006), *Trade openness and volatility*, Centro Study Luca D'Angliano development studies working paper 219, University of Milan.

Hakura D. (2007), *Output volatility and large output drops in emerging and developing countries*, IMF Working Papers 114, Washington.

Henisz W.J. (2000), *The institutional environment for economic growth*, Economics and Politics, 12, 1954-1985.

Hsiao C. (2014), *Analysis of panel data*. Cambridge university press, Vol. 54.

Hnatkovska V., Loayza N. (2005), Volatility and growth, In: Aizenman, J., Pinto, B. (Eds.), *Managing Economic Volatility and Crises: A Practitioner's Guide*, Cambridge University Press, Cambridge.

Irvine O., Schuh S. (2005), *Inventory investment and output volatility*, International Journal of Production Economics, 93-94, 75-86.

Jidoud A. (2015). *Remittances and Macroeconomic Volatility in African Countries,* IMF Working Paper.

Kent C., Smith K., Holloway J. (2006), *Declining output volatility: what role for structural changes*, Research Discussion Paper 2005-08, Reserve Bank of Australia/

Karras G., Song F. (1996), *Sources of business-cycle volatility: An exploratory study on a sample of OECD countries*, 18(4), 621-637.

Kose M.A., Prasad E.S., Terrones, M.E. (2003). *Financial integration and macroeconomic volatility*, IMF Staff papers, 119-142.

Kose M.A., Prasad E.S., Terrones M.E. (2006a), *How do trade and financial integration affect the relationship between growth and volatility?*, Journal of international Economics, 69(1), 176-202.

Koskela E., Viren M. (2003), Government *size and output volatility: new international evidence*, Discussion paper 569, University of Helsinki.

Krebs T., Krishna P., Maloney B. (2004), *Trade Policy, Income Risk, and Welfare*, Brown University Working Paper.

Loayza N.V., Ranciere R., Servén L., Ventura J. (2007), *Macroeconomic volatility and welfare in developing countries: An introduction*, The World Bank Economic Review, 21(3), 343-357.

Malik A., Temple J. (2006), *The geography of output volatility*, Working Paper, University of Bristol.

Mendicino C. (2007). Credit Market and Macroeconomic Volatility. Working Paper Series. NO 743 / March 2007. European Central Bank.

Mubarak A. (2007), *Democracy and policy uncertainty*, Working Paper.

Ramey G., Ramey V. (1995), *Cross Country Evidence on the Link between Volatility and Growth*. American Economic Review 85(5), 1138-51.

Ramey G., Ramey V.A. (1991), *Technology commitment and the cost of economic fluctuations*, National Bureau of Economic Research, No. w3755.

Ratha D. (2003), *Workers' Remittances: An Important and Stable Source of External Development Finance*. In Global Development Finance 2003, Striving for Development Finance. The World Bank, Washington D.C.

Tang H., Groenewold N., Leung C. (2005), *Does Technical Change Reduce Growth Volatility*, Working Paper.

Tang H., Groenewold N., Leung, C. (2008), *The link between institutions, technical change and macroeconomic volatility*, Journal of macroeconomics, mimeo.

Tornell A, Wester Mann F., Martinez L. (2003), Liberalization, *Growth and Financial Crises: Lessons from Mexico and the Developing World*, Brookings Papers on Economic Activity No. 2

World Bank (2015). *Migration and Development Brief 24*, Washington, DC: World Bank.

Orozco M. (2003), *Worker remittances in the international scope*, Inter-American Dialogue Working Paper, commissioned by the Multilateral Investment Fund.

Appendix 1. Data sources and definition of variables.

Variable	Definition	Source
Output volatility	Volatility of output is defined as the three-year moving average standard deviation of annual real GDP growth rate over the period 1985-2012.	Author's own calculation. GDP growth rate data are taken from various issues of the Economic Survey of Pakistan
Worker remittances	The share of worker remittances in GDP.	World Bank's World Development Indicators
Trade openness	Trade openness is defined as the sum of imports and exports of goods and services divided by GDP in constant 2000 prices.	World Bank's World Development Indicators
Financial sector development	Financial sector development is proxied by the average ratio of private sector credit to GDP.	World Bank's World Development Indicators.
Institutional quality	Institutional quality is proxied by an indicator of bureaucracy quality, presidential system and political constraint, where the political constraint is defined as the strength and expertise of the bureaucracy to govern without drastic changes in policy or interruptions in government services.	International Country Risk Guide.
Volatility in discretionary fiscal	Volatility in discretionary fiscal spending is measured as the standard deviation of cyclically adjusted government spending.	Author's own calculation

spending

Appendix 2: List of Sample Countries

Austria	Australia	Bangladesh	Belgium	Philippines	Korea, Rep.	Honduras
Botswana	Bolivia	Brazil	Cameroon	Panama	Mexico	India
China	Columbia	Dominican Republic	Egypt	Peru	Morocco	Indonesia
Ecuador	El Salvador	Gabon	Guatemala	Senegal	Pakistan	Kenya
Turkey	Zambia	Togo	Thailand	Sri Lanka	South Africa	

Waqas Amin[*] - Fayyaz Ahmad[†], Abdul Rauf[‡], Khurram Shehzad, Obaid Ur Rehman

AN INVESTIGATION OF THE LINK BETWEEN MFIS OUTREACH AND PORTFOLIO QUALITY: EMPIRICAL EVIDENCE FROM LATIN AMERICAN COUNTRIES

Abstract

The present study aims to investigate the impact of outreach on portfolio quality for Latin American countries for the period of 2005 to 2014. We have applied several panel data techniques to confirm this association. The econometric techniques include the OLS, the random effects model and the GMM. Our results show that both the depth and breadth of outreach have a negative relation to portfolio quality, suggesting that reaching the poorest clients is risky for MFIs and damages their portfolio quality. In contrast, serving better-off clients is not risky for MFIs and improves the portfolio quality of the institutions. This suggests that extending loans to better-off clients provides a cushion against credit risk. Similar results are found using GMM, although they are not significant. Most of the studies in the field of microfinance have been conducted on the effects of profitability, sustainability, efficiency and outreach, but very few studies have investigated the impact of MFI outreach on portfolio quality.

JEL CLASSIFICATION: G21, G23.
KEYWORDS: OUTREACH; PORTFOLIO QUALITY; LATIN AMERICAN COUNTRIES; GMM

[*] School of Economics, Shandong University, Jinan. P. R. China, 27-Shanda nan lu, Jinan. Shandong. China, waqas.amin97@yahoo.com, +92-301-6932100.

[†] School of Economics, Lanzhou University Lanzhou, Gansu, China, fayyazahmad19@hotmail.com

[‡] School of Economics and Management Sciences. South East University. Nanjing, P.R. China, abdulraufhcc@gmail.com, khurramscholar64@hotmail.com, obaidktk@hotmail.com.

1. Introduction

MFIs' financial products are specifically designed for poor borrowers, helping them establish small businesses to generate income, build property and cope with uncertainty. Microfinancing is a useful way of providing credit to poor people who have no access to banks or other financial institutions (Montgomery and Weiss, 2005). MFIs earn profits working at a small scale, as they obtain information about local needs at a nominal cost. They also contribute to economic development, provide job opportunities and enable women's participation in the economy (Gutiérrez-Nieto et al. 2007).

Since providing credit to the poorest people is costly and may be counterproductive to reaching profitability, MFIs are provided with donations and subsidies from governments and NGOs that serve as the chief financing sources for MFIs. However, such financial assistance has been reduced after the recent economic recession. Therefore, MFIs are becoming more focused on generating profit. Since then, MFIs have witnessed a great shift from being donor-dependent institutions to being efficient and financially sustainable institutions. This profit orientation enables the institutions to cover their costs of lending from revenue earned on portfolio advances and to shrink these costs to the possible greatest extent.

Although the best possible ways of delivering microfinance services have been the locus of interest, it is uncertain which MFIs are working in the best interests of poor people and what goals these institutions are serving. The relation between outreach and sustainability has been the focus of mission drift literature. Mission drift occurs when MFIs prioritize the purpose of profitability at the cost of outreach by lending to better-off poor clients. Another group of researchers found no evidence of a link between outreach and sustainability and rejected the existence of mission drift (Merslan and Strom 2010). In contrast, some researchers have found contradictory results regarding the mission drift phenomenon, suggesting that institutions focusing on outreach have more sustainability and governance (Fernando 2004). Thus, the evidence for mission drift is unclear in the literature.

How do MFIs exist while holding these contradictory objectives simultaneously? There is a great concern that the outreach-sustainability relation is inverse, as profitability may be achieved by sacrificing outreach to poor people. This prompts a debate regarding whether MFIs that focus primarily on financial sustainability decrease their focus on outreach. The

debate leads to two distinct views, one that prioritizes financial sustainability and one that prioritizes outreach.

A question that arises regarding how outreach impacts financial sustainability. The commercialization of MFIs has increased the access of poor people to credit, thereby increasing outreach. Additionally, it has improved financial sustainability by creating a competitive environment and by introducing regulatory control and technological advancements. The view that outreach and financial sustainability may occur simultaneously is called the institutionalist approach. On the other hand, lending to the poorest people may be costly; therefore, it sometimes hinders the goal of achieving financial sustainability. The view that these two objectives are mutually exclusive is called the welfarist approach. For the purposes of policy making, there must be a clear understanding of whether there is a tradeoff or compatibility between financial sustainability and outreach, and there is a dearth of studies that use sophisticated empirical techniques to find conclusive evidence. Most of the studies are either subjective in nature and others have used OS with inadequate data, except for Cull et al. (2007).

Credit risk may not be inversely affected by providing loans to the poorest clients (Wahid 1994). Conning (1994) states that frequent interactions between institutions and clients reduces the probability of a default on payment. A recent study found a positive relation between repayment rate and women clients (D'Espallier et al. 2011). These findings suggest a positive association between outreach (breadth) and portfolio quality. On the other hand, CSFI (2011) a found positive relation between repayment risk and the number of clients, as the increase in the number of borrowers may strain the ability of MFIs to obtain timely repayments. Therefore, we propose a negative relation between portfolio quality and outreach (depth). The present study aims to achieve sophisticated empirical estimations by using the Generalized Methods of Moment (GMM) methodology on a large dataset from 21 Latin American countries consisting 405 MFIs for the period of 10 years from 2005 to 2014.

2. Theoretical Considerations and Literature

Traditional financial institutions generally exclude poor clients, particularly in the rural areas of developing countries, as they are deemed to be the riskiest customer group due to the asymmetry of information and high transaction and monitoring costs. As there exists vast literature on the

importance of financial access for economic progress, making financial services reach poor households is thereby a challenge for governments, particularly in the case of developing countries (Nwakanma et al. 2014; Carter 2013; McKinnon 2010; Shaw 1973). Local moneylenders attempt to fill this gap; however, they charge high interest rates.

To grease the wheel of financial access and extricate poor people from high interest rates, the governments also interfere by offering subsidized credits in backward financial markets. However, the success of such programs is always up for debate, as government-run programs have shown to be disastrous in the past. MFIs appeared as an efficacious way of delivering financial services to poor clients. Contrary to government-run institutions, MFIs are seen as a cost effective and sustainable way to reach poor people. Initially, they started merely with microcredits and later emerged as microfinance institutions that provide complete financial services to poor clients in several parts of the world.

2.1. Overview of MFIs

Commercial banks are believed to provide credit not to poor clients, who are unable to place collateral against loans, but to people who have profitable investment ideas (Sweetman 1998). MFIs are in closer contact with the community and can have more information on them without incurring high expenses. MFIs are not primarily concerned with generating profit, but rather focus on other social issues, such as women's empowerment, job provision, and other environmental issues. These institutions provide microloans to unbanked populations who cannot afford to put up collateral.

MFIs have flourished in countries that have weak financial systems. A campaign initiated by donors and several MFIs reported that more than 40,000,000 people are microfinanced worldwide (Harris 2003). The target was to reach to hundred million poor people by 2005, which was declared Microcredit Year by the UN. Microfinance has been credited with empowering small investors to establish businesses and expand their incomes, along with increasing the economic wellbeing of poor households (Rooyen et al., 2012). Microfinance upholds the view that by providing credit to poor people, poverty can be reduced and socioeconomic structures can be profoundly transformed (Morduch 1999). Policy makers have also reached a consensus that the inclusion of poor clients in a financial system may significantly reduce poverty (Aghion and Boltin 1997; Banerjee and Newman 1993; Galor and Zeira, 1993). Humle (2000) states that microfinance, similar to other aid-based programs, upholds the assumption

that changing human behavior can lead to the attainment of a desired outcome.

This consensus led to early undertakings instigated by governments by means of subsidized funding to widen financial annexation and reduce poverty, which was followed by the emergence of a new microfinance movement and was applauded as an operative resource for financial inclusion and decline in poverty (Matin et al. 2002; Dichter 1997; Johnson and Rogaly 1997). MFIs use group-lending methodology to overcome the issues associated with small-size loans, such as irregular information, unaffordable monitoring costs and moral threats. Group lending has been a focus of interest among economic philosophers and a major proportion of microfinance literature stresses the importance of joint liability offered by the group-lending methodology based on the models of Grameen Bank and BancoSol (Karlan 2007; Armendariz de Aghion and Morduch 2000).

MFIs, since their inception, have provided several services to poor households ranging from microcredit, insurance, and savings to fulfill daily requirements (Armendariz de Aghion and Morduch 2005; Morduch 1999). Today, microfinancing and related activities have been started by many banks in developing countries. MFIs proved the profitability of engaging in activities with low interest rates while providing financial services to poor clients. This may help encourage businessmen and investors to overcome the limited availability of donations and subsidies due to the recent recession. Among several innovations introduced by the MFIs, the most prominent is a group-lending technique in which a specific amount of the loan is jointly allocated among a group of borrowers. This approach seems to be effective in reducing delinquency risks, as borrowers have contact with each other (Morduch 1993).

In Latin America, the first commercial MFI was established in 1992 in Bolivia. It was established by the founders of PRODEM, a nonprofit institution established in 1986. It grew so swiftly that after two years, the demand exceeded the capacity of the institution. To meet the needs of the increasing demand, the founder of PRODEM established BancoSol. (Bodnar 2010) Presently, MFIs are rapidly being commercialized from microlenders to formal financial institutions. The impetus for this transformation was the reduction of government subsidies and donations and the inclination to gain self-sufficiency by achieving profitability. Later, many more institutions relieved themselves of their dependence on donations and obtained funds from the capital markets while simultaneously extending their outreach.

2.2 The Welfarist and Intuitionalist Approaches

The literature includes two approaches to explaining the relation between outreach and financial sustainability: the welfarist approach and the institutionalist approach. The welfarist approach claims that there is a negative relation between outreach and sustainability, as loans with small denominations have fixed costs that increase the total cost (Morduch 2000; Dichter 1997; Hulme and Mosley 1996). According to this view, outreach and financial sustainability are negatively correlated, since serving poor clients with small loans incurs high costs. They also argue that the breadth and depth of outreach are inversely related, as larger breadth can compensate for larger depth (Schreiner 2002).

The approach highlights that MFIs reduce poverty and vulnerability (Bassem 2012), because they emphasize access for the poorest clients while offering them financial products to satisfy their needs (Rhyne 1998). According to this approach, government donations and subsidies fill the gap between the income and lending costs of MFIs, and that the parameter for measuring the success of MFIs is the extent to which poor clients are served (Schreiner 2002). The practical application of this approach is exemplified by the Grameen Bank of Bangladesh (Robinson 2001).

In contrast, the institutionalist approach states that MFIs prioritize sustainability by providing services to better-off clients with more efficiency, with high interest rates and by functioning at a large scale (Bhatt and Tang 2001). The advocates of this approach argue that sustainable MFIs are able to survive for a longer period with broader breath and are better able to serve the poorest clients. The approach argues that the purpose of MFIs is to broaden their outreach by extending financial services, which on the other hand reduces the depth of the outreach. (Schreiner 2002; Von Pischke 1991). According to its financial approach, governments and NGOs are merely temporary sources of funding, while welfare can be achieved in the long run and by deepening the financial access of poor people by making MFIs more profitable for private investors to invest in (Schreiner 2002). According to this approach, MFIs target their financial services at poor people who have productive ideas and desire to effectively use these ideas in order to be financially self-sufficient (Bassem 2012).

2.3 Dimensions of Financial Sustainability

Sound financial performance allows MFIs to achieve profitability that enables them to survive using their own funds in the long term without depending on governments and NGOs for subsidies and donations (Conning 1999). Therefore, good financial performance is important for providing poor people with financial access that persists over in the long term, since short-term or infrequent financial services, caused by the departure of MFIs because of poor repayment rates or the absence of government donations and interest, may not be effective in reducing poverty (Meyer 2002). MFIs are therefore required to attain sustainability in order to contribute to development, which unsustainable MFIs cannot as a result of their burden of costs (Otero 1999).

There is an increased double pressure on MFIs related to their financial performance. First, donors want their funds to be used efficiently. Second, efficiency is needed to have promote long-term existence, since sustainable MFIs can free themselves from subsidies and donations being their major source of funds (Qyas 2012).

The financial performance of microfinance loans depends on the degree to which they are paid off by customers for delivering services (Copestake 2007). A financial performance analysis may motivate high profitability, increase efficiency by minimizing operation costs and disseminate techniques for reducing portfolio risks. For the purposes of this study, financial performance is measured as portfolio quality.

Portfolio quality denotes the ability of borrowers to repay their debts. It arises due to the inability of borrowers to repay their debts. The most important asset for microfinance reported on the balance sheet may be the loan portfolio, the performance of which substantially affects the performance of microfinance (Von Pischke 1996). Thus, the increase in credit risk may harm the performance of MFIs. As lending and advancing is one of the major sources of revenue generation, credit risk management is highly important for achieving sustainability. Microfinance is significantly influenced by high repayment rates, as it is very important for determining private investment. One of the reasons for an increase in credit risk is the escalation of competition, which increases with the proliferation in financial products (Luoto et al. 2007).

In a competitive environment, MFIs increase their credit supply, since people can obtain loans from different suppliers and this increases the risk of

default. Such a situation can be controlled by establishing a well-operating credit system, and creating a regulatory system and lending policies conducive to economic growth (Vogelgesang 2003). Additionally, economies of scale can also lead to a diversification in credit risk, as they increase operational efficiency and reduce interest rates (Wenner et al. 2007). Financial sustainability can therefore be achieved by credit risk management by extending the number of branches, creating new markets and a cumulative rate of return (Von Pichke 1996). An important tool that has been used for credit risk management by banks is the credit score technique. The technique, although it is important particularly in developed countries, may also work in developing countries and may also be an important tool for decision making in microfinance (Schreiner 2000).

2.4 Outreach

Outreach is defined as the access of poor clients to financial services. The primary goal of MFIs is to achieve outreach, i.e., to make available financial services to the poorest borrowers as measured by the number of borrowers served (Kent and Dacin 2013). Outreach includes several concepts, such as depth and breadth (Schreiner 2002).

The depth of outreach measures the financial inclusion of the poorest clients, particularly in backward area (Mersland and Storm 2010). Depth of outreach measures how deep the financial services of the MFIs reach to the poorest clients. It defines the extent to which MFIs serve the poorest households. Depth of outreach determines the quality of microlending but finding a reasonable measure of it is difficult, as the poverty line is hard to measure due to unobtainability of information about individual clients (Quayes 2012; Rhyne 1998). Therefore, the average loan size is reasonably used as a proxy for depth of outreach (Morduch 2000; Rhyne 1998). In addition, the percentage of women borrowers is widely used as proxy for depth of outreach (Qyas 2012; Mersland and Storm 2010; Cull et al. 2007; Bhatt and Tang 2001).

The other dimension of outreach is breadth of outreach, which measures the number of active borrowers at a given time (Navajas et al. 2000). Breadth of outreach measures the number of borrowers served at a given layer of depth by microfinance. In developing countries, the financial inclusion of the poor can be expanded by increasing the breadth of outreach, as a small number of the target population have reach to formal financial services. Moreover, breadth can improve the financial position of MFIs due to the economies of scale (Gonzalez-Vega, 1998).

Qayas (2012) states that at the outset, the objective of serving the poorest clients by MFIs was supported by donations and subsidies, although these sources of funding objectives of the MFIs later plummeted due to the global recession and the MFIs pursuit of financial sustainability and extending the scope of their financial products (Robinson 2001). As a result, the MFIs started to charge high interests on debts, while providing additional services adapted to the circumstances. However, there is a continuing debate on the possible inverse effect of sustainability on reaching out to the poor. Nevertheless, although the debate on sustainability and outreach has been extensively covered (Robinson 2001 and Navajas et al. 2000), the findings of empirical studies on the sustainability-outreach relation are contradictory.

If the commercialization of MFIs has created raised competition and organized savings, it has also generated the issue of mission drift. Navajes et al. (2000) and Von Pischke (1996) found a negative relation between sustainability and outreach, as sustainable MFIs target better-off poor clients. Cull et al. (2007) also claim that profit-oriented MFIs target better-off clients at the expense of outreach. Hermes et al. (2011) also reported a tradeoff between sustainability and outreach of MFIs.

On the other hand, sustainable MFIs are able to utilize their internal sources of finance for extending microcredit without reliance on donations and subsidies and are more able to reach the poorest clients (Robinson 2001). Quays (2012) also found self-sufficiency and outreach to be compatible. Montgomery and Weiss (2011) claim that commercialized MFIs can meet the dual objectives of earning profits and serving the poorest clients.

3. Data and Variables

3.1 Model and Variable Measurement

On the basis of the above discussion, we formed the following equation to be estimated in this section:

$$PQ= \alpha\_1 + \alpha\_2 \, OR\_it + \alpha\_3 \, control\_it + \in\_it$$

where PQ denotes portfolio quality, OR_it reflects vector of outreach, and control_it refers to the vector of other controlling variables included in the study. Moreover, ∈_it is an idiosyncratic term.

With the evolution of the microfinance sector, there is more focus on financial performance and a broad set of performance indicators has been formed, though not all of them have become standard. However, the group consists of several stakeholders, including rating agencies, donors and others who have formed a consensus regarding the definitions of terms of MFIs in 2003, and grouped several ratios in four categories including profitability, efficiency/productivity, portfolio quality and management of assets. In this study, we used portfolio quality as the measure of financial performance.

Portfolio quality is measured by the measure of credit risk. It denotes increased risks due to losses that may arise out of loans. We used portfolio due for more than 30 days (P30) as a measure of credit risk. An optimum portfolio enables organizations to earn the highest return with the lowest risk (Nzongang and Atemnkeng 2006). The most important asset for microfinance reported on the balance sheet may be the loan portfolio, the performance of which substantially affects the performance of microfinance (Von Pischke 1996). Microfinance is significantly influenced by high repayment rates, as it is very important for determining private investment. One of the reasons behind increases in credit risk is an escalation in competition that increases with the proliferation of financial products (Luoto et al. 2007).

Outreach may be defined as the provision of microcredit to the poorest clients (Conning 1999). The primary goal of MFIs is to achieve outreach, i.e., make available financial services to the poorest borrowers measured by the number of borrowers served (Kent and Dacin 2013). Outreach is not a one dimensional concept; rather it encompasses several concepts, such as depth, scope, breadth and length (Schreiner 2002).

Depth of outreach is measured with the average loan per borrower (ALB) (Hermes and Lensink 2011). Depth of outreach measures the financial inclusion of the poorest clients particularly in backward areas (Mersland and Storm 2010). The depth of outreach measures how deep financial services of the MFIs reach to the poorest clients. It defines the extent to which MFIs serve the poorest households. Depth of outreach determines the quality of microlending, but finding a reasonable measure is always difficult, as the poverty line is difficult to measure due to the unobtainability of information on individual clients (Quayes 2012; Rhyne 1998). Therefore, the average loan size is used as a proxy for the depth of outreach (Morduch 2000; Rhyne 1998). The other dimension of outreach is the breadth of outreach, which measures the number of active borrowers at a given time (Navajas et al. 2000).

Breadth of outreach measures the number of borrowers served at a given layer of depth by microfinance. In developing countries, the financial inclusion of poor people can be expanded by increasing the breadth of outreach, as a small number of the target population have access to formal financial services. Moreover, breadth can improve the financial position of MFIs due to economies of scale (Gonzalez-Vega 1998). Breadth of outreach is measured by the number of active borrowers (NOAB) (Ashraf et al. 2014; Hermes et al. 2008).

Controlling variables are divided into two categories: institutional variables and macro variables. Institutional variables include regulation status (RG), ownership, number of offices (OFF), diamonds count (DM), age and size. Macro variables include GDP and MFIs count (COUNT).

3.2 Data Collection and the Sample

Data pertaining to MFIs was collected from the Mix Market database for 405 MFIs in 21 Latin American countries for the period from 2005 to 2014. Additionally, country-level data were collected from World Bank Development Indicators.

3.3 Econometric Analysis

A panel data technique has been applied to obtain empirical results, including the fixed effects model (FE) and the random effects model (RE). The model includes time invariant variables where FE does not remain efficient. Therefore, we used the RE model with robust standard error (SE) clustered at firm level that is efficient against heteroscedasticity and autocorrelation (Wooldridge 2002). As a base model, we ran OLS with a robust standard error (SE) that is effective against heteroscedasticity and autocorrelation. To identify the appropriate model from OLS and RE, we found the Breusch-Pagan Lagrange multiplier (LM) that suggests the RE is more suitable for the model in this study. According to Quayas (2012), outreach and sustainability may have endogeneity as both determine each other simultaneously. To resolve the problem of endogeneity, we ran a two-step GMM accompanied by Roodman's (2006) procedure and a finite-sample corrected SE as proposed by Windmeijer (2005).

3.4 Descriptive Estimation

The descriptive statistics of all of the variables are presented in table 1. The table includes the number of observations, average value, standard deviation, and range for all dependent, independent and controlling variables for the years 2005 to 2014.

Table 1. Descriptive Statistics

Variables	Observations	Mean	Stand. Dev	Minimum	Maximum
P30	2902	0.065	0.076	0	1
OFF*	2910	2.251	1.320	0	6.312
SIZE*	3225	16.275	1.972	9.212	22.445
AGE	3292	2.745	0.563	1	3
RG	3283	0.442	0.497	0	1
DM	3300	3.834	0.901	1	5
ETA	3215	0.339	0.261	-4.127	3.607
ALB*	3275	16	2.026	9.357	22.132
NOAB*	3179	9.169	1.722	0.693	14.760
GDP*	4046	25.340	1.686	21.307	28.592
COUNT*	4022	3.224	0.723	0	4.174

*these variables are in log form

4. Results

We present the results of outreach on portfolio quality while controlling for other variables. An LM test was run that indicated that the RE model is preferable. However, the results of OLS are presented with RE as a base model. Finally, a dynamic panel data analysis is utilized, which is the most powerful technique for dealing with dynamic data.

Table 2. Outreach and Portfolio Quality (P30)

	OLS		RE	
P30	Coef.	T	Coef.	Z
ALB	-.0215263	-3.69*	-.0158284	-1.80***
NOAB	-.0086326	-4.80*	-.0051626	-1.30
CO	-0220376	0.43	.0038658	0.24
BANK	.0038788	0.08	-.0125401	-0.85
NBFI	.0328102	0.65	.0143336	0.88
NGO	.0359461	0.70	.0155093	0.76
OFF	.000203	4.94*	.0001748	3.43*
SIZE	.0246955	4.24*	.0152126	1.61
AGE	.0078598	2.53**	.0130309	3.32*
RG	.0166825	3.91*	.0154516	1.41
DM	-.0167739	-8.23*	-.0124795	-4.78*
ETA	.0257686	3.63*	.0191818	1.08
GDP	-.0031518	-2.96*	-.002243	-1.30
COUNT	-.0043654	-1.87***	-.0027823	-0.77
C	.1764678	2.92*	.1715809	2.79*
Observ.	2681		2681	
F stat	16.64*			
Wald chi2			77.45*	
Adj. R2	0.075		0.075	
LMtest– Chi2	815.75			

Table 2 shows the results regarding the relation between outreach and portfolio quality (P30). ALB and NOAB are both found to have negative relations with P30, which indicates that reaching out to the poorest clients is risky for MFIs and damages the portfolio quality of the institutions, while serving better-off clients is not risky for MFIs and improves the portfolio quality of the institution. This suggests that extending loans to better-off clients provides a cushion against credit risk. The type of ownership is not significant for P30. OFF is observed to have a positive coefficient in both models, suggesting that with an increase in offices, delinquent risk management may be negatively affected due to diversification of managerial personnel. Similarly, SIZE is also found to increase delinquent risk

significantly, and that may be due to agency issues. AGE and RG were also found to increase P30. AGE is significant in both models and RG is significant only in the case of OLS. DM has a negative coefficient with P30 that suggests that MFIs with a high number of diamonds are better able to control delinquent risk. ETA is only significant in the case of OLS with a positive coefficient but not significant in the case of RE. Additionally, GDP and COUNT are significantly negative in OLS, suggesting that with an increase in GDP and the number of MFIs, delinquent risk decreases as previously found by (Ahlin et al., 2011). The analysis should not be restricted to OLS or RE if endogeneity is expected to be present in model. Therefore, we included two-step GMM in the estimations.

Table 3. Dynamic Panel Data Analysis.

CPB	Coef.	Corrected Std. Err.	T	P>t
L1. CPB	.3262628	.079888	4.08	0.000
ALB	-.020996	.0164891	-1.27	0.204
NOAB	-.002474	.0087187	-0.28	0.777
OFF	-.0063387	.0100913	-0.63	0.530
SIZE	.0181252	.0165999	1.09	0.276
AGE	.0080175	.0078329	1.02	0.307
RG	.0336744	.0199474	1.69	0.092
DM	-.0116312	.0037896	-3.07	0.002
EETA	.0007661	.0400985	0.02	0.985
GDP	.0008239	.0030944	0.27	0.790
COUNT	.0011254	.0058477	0.19	0.847
BANK	-.031317	.0340031	-0.92	0.358
NBFI	-.029599	.0201281	-1.47	0.142
CO	-.0832342	.0329282	-2.53	0.012
C	.1314832	.0794636	1.65	0.099
f-stat	7.96*	Hansen J-stat	306.54(0.216)	
AR(1)	-3.23(0.000)			
AR(2)	1.09(0.277)			

The relation between P30 and outreach is found to be consistent in table 3, as was previously found using the OLS and RE models. ALB and NOAB are observed to be not significant. RG has a significant positive relation and CO has a significantly negative relation to P30. Moreover, OFF, SIZE, AGE, ETA, GDP, COUNT and types of ownership other than CO are found to be

not significant. Later, significant AR (1) and not significant AR (2) show the goodness of the model. The instruments are also validated, as we found that Hansen J-stat.hat is not significant.

5. Conclusion

The commercialization of MFIs has increased the access of poor people to credit, thereby increasing their outreach. Additionally, it has also improved their financial sustainability by providing a competitive environment, regulatory controls and technological advancements. The view that outreach and financial sustainability may occur simultaneously is called the institutionalist approach. On the other hand, lending to the poorest clients may be costly and sometimes hinders the goal of achieving financial sustainability. The view that these two objectives are mutually exclusive is called the welfarist approach. For the purposes of policy making, there must be a clear understanding of whether there is a tradeoff or compatibility between financial sustainability and outreach, and there is a dearth of studies that use sophisticated empirical techniques to find conclusive evidence. Most of the studies are either subjective in nature and others have used OLS with inadequate data, except for Cull et al. (2007).

The present study aims to achieve sophisticated empirical estimations by using the generalized methods of moment (GMM) methodology on a large dataset from 21 Latin American countries consisting 405 MFIs for the 10-year period from 2005 to 2014. The data pertaining to the MFIs was collected from the Mix Market database for 405 MFIs in 21 Latin American countries for the period from 2005 to 2014. Additionally, country-level data was collected from World Bank Development Indicators.

We obtained the results of the effects of outreach on portfolio quality while controlling for other variables. An LM test was run that indicated the RE is preferable. However, the results of the OLS are presented with RE as a base model. Finally, dynamic panel data analysis was presented, which is the most powerful technique for dealing with dynamic data.

We found that ALB and NOAB both have a negative relation with P30, which indicates that reaching the poorest clients is risky for MFIs and damages the portfolio quality of the institutions, while serving better-off clients is not risky for MFIs and improves the portfolio quality of the institution. This suggests that extending loans to better-off clients provides a cushion against credit risk. We therefore found mission drift between

portfolio quality and outreach of MFIs. SIZE, and OFF also have negative impacts on portfolio quality; therefore, the better way to obtain the best outreach and portfolio quality is to not increase SIZE and OFF of the microfinance institutions. In this way, the MFI can attain the best portfolio quality without damaging its outreach.

References

Ashraf A., Kabir Hassan M., J. Hippler III W. (2014), *Performance of microfinance institutions in Muslim countries*, Humanomics, 30(2), 162-182.

Atemkeng T., Nzongang J. (2006), *Market structure and profitability performance in the banking industry of CFA countries: The case of commercial banks in Cameroon*, Journal of Sustainable Development in Africa, 8(2), 1-14.

Bhatt N., Tang S.Y. (2001), *Delivering microfinance in developing countries: Controversies and policy perspectives*, Policy studies journal, 29(2), 319-333.

Bodnar T.E. (2010), *The evolution of microfinance in Bolivia: a commercialized industry*, Research project.

Conning J. (1999), *Outreach, sustainability and leverage in monitored and peermonitored lending*, Journal of Development Economics, 60(1), 51-77.

Cull R., Demirgu¨ç-Kunt A., Morduch J. (2007), *Financial performance and outreach: A global analysis of leading microbanks*, The Economic Journal, 117(517), 107-133.

Gonzalez A. (2007), *Efficiency drivers of microfinance institutions: the case of operating cost*, Microbanking Bulletin, Autumn, 37-42.

Gutiérrez-Nietoa, B., Serrano-Cincaa, C., Molinero, C. M. (2007), *Microfinance institutions and efficiency*, International Journal of Management Science, 35(2), 131-142.

Hartarska V., Chaudill S.B., Gropper D.M. (2007), *The cost structure of microfinance institutions in Eastern Europe and Central Asia*, William Davidson Institute, Working Paper No. 809.

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

Meyer R.L. (2002), *Track record of financial institutions in assisting the poor in Asia,* Research Paper No. 49, Manila: ADB.

Montgomery H., Weiss J. (2011), *Can commercially- oriented microfinance help meet the millennium development goals? evidence from Pakistan*, World Development, 39(1), 87-109

Morduch J. (2000), *The microfinance schism*, World Development, 28(4), 617-629.

Navajas S., Schreiner M., Meyer L.R., Gonzalez-Vega C., Rodriguez-Meza J. (2000), *Microcredit and the Poorest of the Poor: Theory and Evidence from Bolivia*, World Development, 28(2), 333-346.

Olivares-Polanco F. (2005), *Commercializing microfinance and deepening outreach? Empirical evidence from Latin America*, Journal of Microfinance, 7(2), 47-69.

Quayes S. (2012), *Depth of outreach and financial sustainability of microfinance institutions*, Applied Economics, 44(26), 3421-3433.

Rhyne E. (1998), *The yin and yang of microfinance: Reaching the poor and financial sustainability*, Microfinance Bulletin, 6–8.

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.

Robinson M. S. (2001), *The Microfinance revolution: sustainable finance for the poor*, World Bank, Washington, DC.

Roodman D. (2006), *How to do xtabond2: an introduction to difference and system GMM in Stata*, Centre for Global Development, Working Paper No. 103.

Schreiner M. (2001), *Informal finance and the design of microfinance*, Development in Practice, 11(5), 637-640.

Schreiner M. (2002), *Aspects of outreach: a framework for discussion of the social benefits of microfinance*, Journal of International Development, 14(5), 591-603.

Servin R., Lensink R., Berg M.V.D. (2012), *ownership and technical efficiency of microfinance institutions: empirical evidence from Latin America,* Journal of Banking and Finance, 36(7), 2136-2144.

Von Pischke J.D. (1996), *Measuring the tradeoff between outreach and sustainability of micro- enterprise lenders*, Journal of International Development, 8(2), 225-239.

Windmeijer F. (2005), *A finite sample correction for the variance of linear efficient two-step GMM estimators*, Journal of Econometrics, 126(1), 25-51.

Woller G. (2002), *The promise and peril of microfinance commercialization*, Small Enterprise Journal, 13(4), 12–21.

Wooldridge J.M. (2002), *Econometric analysis of cross section and panel data*, MIT Press, Cambridge, MA.

Zeller M., Meyer R.L. (2002), *The triangle of Microfinance: Financial Sustainability, Outreach and Impact*, The Johns Hopkins University Press, London.

Zerai B., Rani L. (2012), *Is There a Tradeoff between Outreach and Sustainability of Micro finance institutions? Evidence from Indian Microfinance Institutions (MFIs)*, European Journal of Business and Management, 4(2), 90-98

G. & L. E. R., Vol. 23 No. 1, 2019

Umer Shahzad[*], Fengming Qin[†], Muhammad Umar Farooq[‡]

CAPITAL FLIGHT, TERRORISM AND MILITARY EXPENDITURES: EMPIRICAL EVIDENCE FROM THE SUB-SAHARAN AFRICAN AND MENA REGIONS

Abstract

The present study empirically scrutinizes the roles of terrorism, military expenditures, political stability and economic indicators in capital flight in the cases of sub-Saharan African, Middle Eastern and North African countries using annual data from 1990–2015. In this regard, we apply pooled OLS, generalized method of moments (GMM), quantile regression and two-stage GMM as estimation techniques. Overall, the results show that terrorism, economic growth and trade openness lead to an increase in capital flight. In contrast, military expenditures moderate the negative effect of terrorism, which results in lowering capital flight. Political stability is proven to be a significant factor in reducing capital flight, which captures the attention of researchers and policymakers. Moreover, regional analysis reports robust results in the case of a full panel. In summary, the study has multiple policy recommendations: (i) capital flight can be controlled by investing in the military and by making counter terrorism policies; (ii) the countries of both regions need to create a stable political environment for a better economy; and (iii) to reduce capital flight, it is essential to implement strict policies for economic development and to stop the shifting of funds to tax havens.

JEL CLASSIFICATION: C50, D74, F23, N40, O55.
KEYWORDS: CAPITAL FLIGHT, MILITARY EXPENDITURES, TERRORISM, MIDDLE EAST AND NORTH AFRICA, SUB-SAHARAN AFRICA.

[*] School of Economics, Shandong University, Jinan. PR China, 27-Shanda nanl lu, Jinan. Shandong. P.R China, shehzad-umer@hotmail.com.

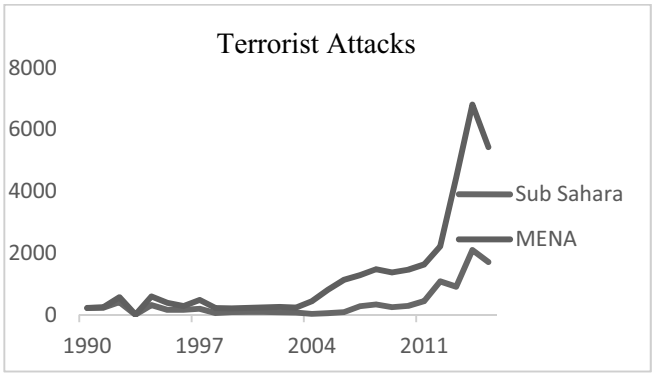
[†] School of Economics, Shandong University, Jinan. PR China, 27-Shanda nanl lu, Jinan. Shandong. P.R China, fmqin@sdu.edu.cn.

[‡] Government College University Faisalabad, Faisalabad Pakistan and 3Center of Economic and Research, Shandong University, Jinan. P.R China, umarfarooqgcuf@yahoo.com.

1. Introduction

The age of globalization has brought technological innovations and economic development and has made human life easy. Consequently, it has also brought many challenges, such as national sovereignty, security, peace, violence and terrorism (Kuepper 2018). Between 1990 and 1996, the number of terrorist attacks was 162% of the number during the cold war. After a few more years, the number of terrorism incidents increased to 200% of the number during the cold war, and these attacks were directed against civilians rather than governments (Stibili 2010). In the last two decades, the world has seen an unprecedented increase in terrorist attacks, particularly in developing countries. The terrorist attacks at the Radisson Blu Hotel (2015) in Mali and the Sinai Russian plane crash (2015) in Egypt demonstrate that terrorism has become a national challenge for sub-Sahara African and Middle Eastern and North African (MENA) countries. The increasing number of terrorist incidents causes uncertainty, low security, fear and insecure environments for business and investments, leading to low growth, low FDI and high capital flight from these countries. Figure 1 shows the number of terrorist attacks in sub-Saharan African and Middle Eastern and North African (MENA) countries.

Figure 1. Terrorist attacks in sub-Saharan African and MENA countries



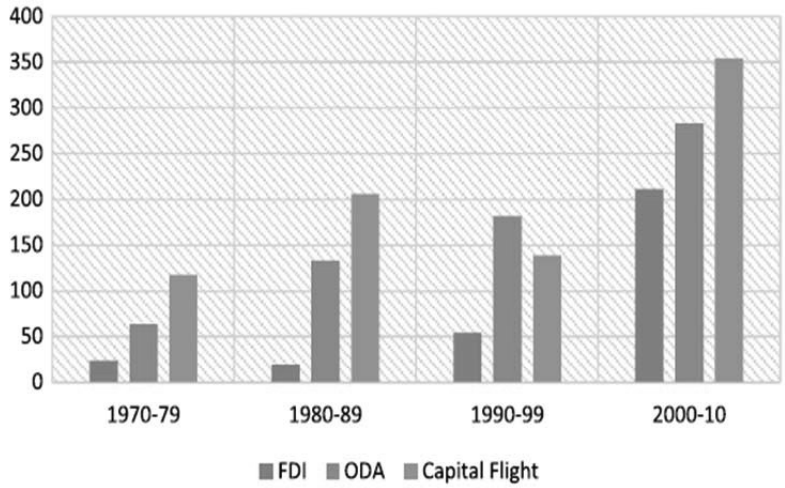
Source: Author's calculation using data from the Global Terrorism Database (2015).

During the last three decades, capital flight from developing countries has continuously increased and has had significant effects in fostering terrorism (Asongu and Nwachukwu 2016; (Global Terrorism Index 2014). Terrorism is a new kind of violence that has economic, social and religious consequences. To mitigate the effects of terrorism at the international and national levels, several antiterrorism agreements and pacts have been made by the United Nations Office of Counter-Terrorism and the European Council (Donnell 2006; United Nations 2014). Antiterrorism actions include the options of military operations or dialogues with terrorist groups to reduce terrorist attacks. Capital flight is the movement of funds and economic resources outside of a country due to adverse change in the country's political, economic and social environment (Gunter 2008 and Cheung et al. 2016).

In any country, foreign investors can enter into a domestic market in the following ways: foreign direct investment, portfolio equity investment and foreign debt. Capital inflows and capital flight depend on sufficient expected returns, given projected risk. Risk is a function of many factors including legal environment, nonviolent and peaceful society, political stability and economic policies (Filer and Stanisic 2016). Exposure to terrorism represents a source of risk that can influence investment decisions, capital flows and capital flight (Abadie and Gardeazabal 2008). Terrorism incidents create uncertainty, chaos, and violence, which further disturb the law and order situation and minimize the rate of return on investments. For this reason, foreign investments decrease and domestic investors plan to shift their businesses and investments abroad.

African countries have experienced increasing capital flight in the past three decades (Asongu 2014b). From 1970 to 2010, thirty-three countries in Africa lost capital totaling 814 billion US dollars (Boyce and Ndikumana 2012). The amount lost in capital flight is more than their foreign direct investment and official development assistance. African countries face a shortage of financing. The lack of finances and funds in Africa leads towards extreme poverty and lowers social service delivery (Amankwah-Amoah 2016). Figure 2 illustrates capital flight and external financial flows from African countries from 1979 to 2010.

Figure 2. Capital flight, FDI and Official development assistance (values in billion US$)



Source: Boyce and Ndikumana (2012).

Due to the increasing trend of terrorism, the governments of many countries have directed certain measures to fight against terrorism, such as blocking the terror financing source and using the military against terrorist groups, etc. (Koh 2007; Czinkota, et al. 2010). Additionally, research studies have highlighted that military expenditures do not always help to control terrorism (Feridun and Shahbaz 2010; Bois and Buts 2014). The literature regarding capital flight, terrorism and military expenditure remains unclear about the thresholds at which terrorism affects capital flight and military expenditures help to decrease the effect of terrorism on capital flight.

Against this backdrop, the first objective of the study is to assess the impact of terrorism on capital flight from sub-Saharan African and MENA countries. Second, the study aims to investigate the impact of military expenditures to reduce the negative impact of terrorism on capital flight. The notion of threshold of military expenditures is consistent with critical mass theory; it is taken as a policy variable to examine its positive or negative impact on capital flight. An empirical relationship of military expenditures with capital flight is consistent with Kuznets curve and U-shapes (Ashraf 2013; (Batuo 2015). Third, the study aims to econometrically investigate the impact of economic indicators, such as inflation, growth, exchange rate, and

trade openness, on capital flight for the top terrorism-affected countries in the sub-Sahara and MENA regions. Finally, the study also investigates the impact of political stability on capital flight for sub-Saharan African and MENA countries.

The present study contributes to multifold purposes. First, the study attempts to reduce the conflicting gap in the literature concerning military expenditures to mitigate the effect of terrorism. Although a wide literature is available regarding violence and capital flight (Hermes and Lensink 2001; Fielding 2004; Vu Le and J. Zak 2006), the relationship of terrorism and capital flight is still unexplored for South Asian, Pacific Asian, sub-Saharan African (SSA) and Middle Eastern and North African (MENA) countries. In addition, terrorism has received greater attention regarding incidents in Europe and the Middle East and less attention regarding Africa, Asia and Middle Eastern and North African (MENA) countries (Fazel 2013). Second, the study explores the capital flight and terrorism relationship regarding African and Middle Eastern and North African (MENA) countries. Third, the study examines the level at which military expenditures start to mitigate terrorism and capital flight by incorporating military expenditures and political stability as policy variables and economic indicators (growth, trade openness, inflation and exchange rate) as control variables for the major terrorist victim countries of the sub-Saharan African (SSA) and Middle Eastern and North African (MENA) regions.

The remainder of the paper is designed as follows. Section 2 summarizes the theoretical and empirical literature related to the paper. Section 3 presents data and methodology, and section 4 describes the results and discussion of a full panel and regional analysis. The last section provides the conclusion and policy implications.

2. Intuition and Background Literature

Concerning the relationship between terrorism, military expenditures and capital flight, very limited studies have been conducted (see Asongu 2014b; Ndikumana, et al. 2015; Efobi and Asongu 2016; Asongua and Amoah 2017). The first strand of study discusses terrorism and capital flight, which is derived from political access theories (Eyerman 1998). Political access theories argue that terrorism is high in politically unstable regions and less in politically stable regions. Capital stock decreases in value in politically unstable countries; accordingly, domestic investors are compelled to shift

their investments abroad to secure returns and profits. This behavior further leads to the idea of how terrorism and violence affect capital flight (Davies 2011). The theoretical relationship between political stability and terrorism not only is linked with economies but also opens the window of military options to reduce terrorism and terrorist groups in regions (Feridun and Shahbaz 2010). Politically unstable[1] countries are naturally more linked to capital flight; political instability is based on civil wars, political strife and conflicts. The second strand of the study explains the terrorism-military-capital nexus (Efobi and Asongu 2016; Asongua and Amoah 2017). Military expenditure is used as a policy variable to minimize terrorist attacks and for protection and peace in a country, which further helps to reduce capital flight (Anwar, et al. 2014; Asongua and Amoah 2017).

First, due to the capital flight trap, lagged capital flight is expected to increase the next period's capital flight. Second, economic growth could either increase or decrease capital flight dependent on whether it is concentrated or broad-based in specific sectors of the economy such as heavy resource industries, etc. Broad-based economic growth could minimize capital flight because it shows a positive outlook for investment (Asongua and Amoah 2017). Third, inflation is considered an inducing factor for capital flight because it is linked with risk and uncertainty in return on investment and negative economic growth (Kelsey and Le Roux 2016). Fourth, trade openness depends on the economy, whether broad- or narrowly based. Similarly, trade openness and financial globalization are considered to be closely linked with capital flight because they provide trade mis-invoicing and transfer mispricing (Ndikumana and Boyce 2011; Asongua and Amoah 2017).

Efobi and Asongu (2016) conducted empirical analysis of 29 African countries over the period 1987 to 2008. The study employed generalized method of moments (GMM) and quantile regression for econometric analysis. The results highlighted that domestic terrorism, total terrorism and unclear terrorism increase capital flight from Africa. In addition, empirical estimations proved that political stability, external debt and economic growth induce increased capital flight in most of the periods. The capital flight trap also proved an econometric model indicating that previous year capital flight increases future capital flight. Asongua and Amoah (2017)

[1] The political stability index was produced by Daniel Kaufmann (Natural Resource Governance Institute and Brookings Institution) and Aart Kraay (World Bank Development Research Group). www.govindicators.org.

empirically investigated the threshold at which military spending helps to moderate the effect of terrorist attacks on capital flight for 37 African countries over the period 1996 to 2010. The study applied contemporary and noncontemporary OLS, fixed effect method, generalized method of moments (GMM) and quantile regression to check the terrorism-military-capital nexus. The results highlighted that military expenditures help to control domestic, total and unclear terrorism from the region, while no relation was found for transnational terrorism. In addition, the results implied that from 5% to 7% more military expenditures (% of GDP) are required to mitigate the negative effect of terrorism on capital flight.

Ellyne and Mbewe (2015) empirically examined the important determinants of capital flight for Nigeria, South Africa and Zambia over the period 1970 to 2010 by employing the Johnson-cointegration technique and vector error correction model (VECM). The results reveal that capital flight from South Africa and Zambia is driven by currency depreciation and that for Nigeria, capital flight is affected by currency appreciation. The results further indicate that inflation and foreign direct investment also influence the capital flight of studied countries, while political factors also confirmed significant impact favoring capital flight. Williamson (1985) argued that those countries that properly manage their actual exchange rate can improve their exports and can attract more foreign direct investments.

Feridun and Shahbaz (2010) documented two theoretical views of military expenditures and terrorism. When terrorism in any country increases, it leads to an increase its military and defense expenditures to eliminate terrorists and terrorist elements; a positive outcome is thus expected when military expenditure is an outcome indicator. Accordingly, when military spending increases, it results in peace and low terrorism. The study further argued that military expenditures do not always lower terrorism; occasionally, they increase terrorism and work as fuel for terrorist groups. Per this theoretical framework, military expenditures are used as a policy variable to fight against terrorism.

Sandler (2005) highlighted that counter terrorism efforts result in more terrorism. Similarly, a lack of comprehensive and common policies against terrorism at the international level has induced an increase in the ineffectiveness of country-specific antiterrorism policies (David 2005). This narrative is consistent with the evidence that the policies of the United States against terrorism have further fueled terrorism (Lum, et al. 2006a). The above theoretical and empirical studies are inconclusive on the effect of

military expenditures on terrorism. The intuition and theory of this inquiry is logical and sound. The study joins the strand of previous researchers (Costantini and Lupi 2005; Lum, et al. 2008b; Narayan, et al. 2011; Asongu and Nwachukwu 2016a; Asongua and Amoah 2017) in arguing that applying econometric techniques for analysis is not based on acceptance or rejection of these theories. Although an econometric analysis based on theory and sound intuition could be a useful empirical exercise to prove the theory and for policy implications. Such intuition has been employed in recent terrorism studies and to form antiterror policies (Asongu and Nwachukwu 2017; Asongua and Amoah 2017).

3. Modeling and Data Specification

3.1 Data

The study employed panel data of 15 sub-Saharan African and 14 Middle Eastern and North African (MENA) countries. The list of countries is provided in Table A-1 (appendix). The motivation behind the selection of these two regions is that both regions are top ranked in terrorism per the Global Terrorism Index 2017 (GTI 2017). The study employed the data from 1990–2015 for econometric estimations and empirical results. The study gathered data from five sources: (i) terrorism data are collected from Global Terrorism Database (2015); (ii) capital flight data for 17 countries are obtained from Boyce and Ndikumana (2012), while for the remaining 11 countries, capital flight data are calculated by using the World Bank residual method (World Bank 1985); (iii) military expenditures, inflation, gross domestic product, trade openness and exchange rate data are obtained from (World Development Indicators 2015); (iv) political stability data are gathered from Kaufmann et al. (2010)[2]; and (v) economic indicator data for Somalia, Mali, Niger and Sudan are obtained from the Africa Economic Development Institute (2018).The terrorism variable in this study shows the total number of terrorist attacks in any country. To avoid mathematical concerns with log transforming zeros and correction for positive skewness, we take the natural log of number of attacks and add one to the base. Recently, Bandyopadhyay et al. (2014) and Efobi and Asongu (2016) also employed a similar method.

[2] Kaufmann, Daniel, Kraay, and Mastruzzi (2010) provided the estimated data of political stability of all countries in their working paper for The Worldwide Governance Indicators. The data are available at World Development Bank Governance Indicators from 1996 onwards.

3.2 Capital Flight Measurement

This study employed the residual method of the World Bank (1985) to calculate the capital flight data for 11 countries, as the data for several African countries are already provided by the University of Massachusetts (2016) on the portal of the political economy research institute. Beja (2006), Makochekanwa (2007) and Cheung et al. (2016) also employed a similar method for capital flight calculation for the case of South East Asia, Zimbabwe and China.

$$CF_i = \Delta ED + FDI - CAD - \Delta FR \quad (1)$$

Outward capital flight[3] exists when total sources of money are greater than total use of money (Cheung, et al. 2016). However, sources of funds are the following: CF_i denotes capital flight for country i; ΔED is total change in external debt stocks; FDI represents net foreign direct investment; CAD denotes current account balance (if it is surplus, it is added; if it is deficit, it is subtracted from the equation); and ΔFR shows change in foreign reserves.

3.3 Methodology

The descriptive statistics of the variables are reported in Table 1. Some of the variables are shown in logarithm form for comparison of means. The study examines the role of terrorism, military expenditures and political stability in the mitigation of capital flight. The study employed economic indicators as control variables (inflation, GDP, trade openness and exchange rate) and investigated their relationship with capital flight. The interaction term is the product of terrorist attacks and military expenditures per 100,000 people in any country. The panel ordinary least squares and quantile regression model is presented below.

$$CF_{it} = f(terrorism, military\,\exp enditures, \inf lation, gdp, openess, exchange, politicalstability) \quad (2)$$

[3] Capital flight is beneficial if it helps reduce trade barriers and circumvent distortionary capital controls.

$$CF_{i,t} = \beta_0 + \beta_1 TA_{i,t} + \beta_2 ME_{i,t} + \beta_3 INT_{i,t} + \sum_{g=1}^{4} \mathrm{K}_g Z_{g,i,t} + ps_i + \mu_{i,t} \qquad (3)$$

where $CF_{i,t}$ denotes the capital flight in year t, T_{it} represents the number of terrorist attacks in the year, and M_{it} shows the yearly military expenditures in current US $. $INT_{i,t}$ shows the interaction term (product of terrorist attacks and military expenditures) in country i at time t. $Z_{i,t}$ presents the control variables (inflation, GDP, trade openness and exchange rate), ps shows the country-specific political stability, and $\mu_{i,t}$ represents the error term of the regression model.

Table 1. Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Max
TA	20.7125	2.11731	11.52343	25.34073
ME	2.440733	1.788949	0	8.275376
INT	23.50669	3.083822	11.56028	33.35851
INF	21.0434	3.952164	10.17743	32.13681
GDP	2.146299	1.325838	-2.53825	10.19474
TO	7.039004	1.50679	4.356709	10.92544
ER	3.985935	0.661081	-3.86327	5.038475
PS	3.76624	3.3704	-19.85	10.37036

TA is the terrorist attacks, Me shows the military expenditures, IN*T* represents the interaction term of military expenditures and terrorist attacks, and *INF* presents the inflation. *GDP* presents the gross domestic product per capita. *TO* shows the trade openness, *ER* addresses the exchange rate, and PS shows political stability.

3.4 Estimation Strategy

The study employed pooled OLS and difference generalized method of moment (difference GMM) introduced by Arellano and Bond (1991), which consider the autoregressive (1) and autoregressive (2) with separate individual unobserved specific factors models. The paper employed the generalized method of moment (GMM) for the following reasons. First, the GMM technique accounts for all endogeneity issues in all regressors by using instrumental values of regressors and controlling for time-invariant omitted variables. Second, the GMM technique controls for the capital flight trap, as the criteria for persistence of capital flight are met. Third, for the case of dynamic panel estimations when entities (N) are greater than time (T), it is necessary to rely on dynamic-based panel estimations, such as difference GMM (Bond, et al. 2001). The data from 29 countries (N=29) cover a period of 26 years (T=26). The dynamic panel model is more appropriate when N is greater than T (Baltagi 2008). Moreover, cross-country variations are considered in the specifications. In addition, the study applied quantile regression and sequential estimation (two-stage GMM) introduced by Kripfganz and Schwarz (2015) for regional analysis.

$$CF_{i,t} = \beta_0 + \beta_1 CF_{i,t-1} + \beta_2 T_{i,t} + \beta_3 M_{i,t} + \beta_4 INT_{i,t} + \sum_{g=1}^{4} \mathrm{K}_g \mathrm{Z}_{g,i,t} + \mu_t + \varepsilon_{i,t} \tag{4}$$

$$CF_{i,t} - CF_{i,t-1} = \beta_1 (CF_{i,t-\tau} - CF_{i,t-2\tau}) + \beta_2 (T_{i,t} - T_{i,t-\tau}) + \beta_3 (M_{i,t} - M_{i,t-\tau}) + \beta_3 (INT_{i,t} - INT_{i,t-\tau}) + \sum_{g=1}^{4} \mathrm{K}_g (Z_{g,i,t} - Z_{g,i,t-2\tau}) + (\mu_t - \mu_{t-\tau}) + \varepsilon_{t,t-\tau} \tag{5}$$

The capital flight shows unrecorded capital flows between one country and the rest of the world. Its measurement starts from the inflow of foreign exchange, which is recoded in a country's balance of payments. The difference between recorded inflows and recorded outflows is also termed net errors and omissions. This definition is increasingly used in capital flight studies (Ndikumana, et al. 2015; Weeks 2015; Efobi and Asongu 2016).

4. Results and Discussion

The empirical results of the full panel are reported in Table 2. Pooled OLS and difference GMM are applied for estimations of the full panel, while ordinary least squares, quantile regression and sequential estimation methods are applied to assess the robustness of results for the full panel. In addition, quantile regression graphs represent results similar to those in other estimation techniques, and quantile graphs are presented in appendix 1. Among all independent variables, lagged capital flight, terrorist attacks, military expenditures, the interaction term and gross domestic product have a statistically significant relationship with capital flight. Moreover, trade openness shows a significantly positive relationship and political stability highlights are significantly negative in pooled OLS. The results indicate that terrorist attacks and lagged capital flight induce increased capital flight for all of these countries because sub-Saharan African and MENA countries are top ranked in terrorism attacks during the last two decades, and terrorism continues to spread and increase in these regions (Global terrorism Index 2017). The capital flight trap shows that previous year capital flight increases capital flight in the coming period because the estimates of capital flight have positive values in previous years. The finding is consistent with Efobi and Asongu (2016) and Asongua and Amoah (2017) for the case of African countries. Military expenditures are proved a very important factor, as they show a significantly positive coefficient, indicating that more investments in the military to combat terrorism increase capital flight from these countries.

Table 2. Pooled OLS and Generalized Method of Moments

Variable	Pooled OLS	GMM
Lag CF		0.3805***
TA	0.709***	0.4292***
ME	0.786***	0.4968***
INT	-0.724***	-0.4443***
INF	-0.006	-0.0532
GDP	0.931***	0.6280***
TO	0.378*	0.1420
ER	-0.024	0.0036
PS	-0.367***	-0.1324
Constant	7.216	4.3568

Lag CF shows lagged capital flight, TA is terrorist attacks, Me shows military expenditures, INT represents the interaction term of military expenditures and terrorist attacks, and INF presents inflation. GDP presents gross domestic product per capita. TO shows trade openness, ER addresses exchange rate, and PS shows political stability. *, **, and *** represent the level of significance at 10%, 5% and 1%, respectively.

AR (1): (0.081)
AR (2): (0.361); Sargon OIR: (0.978)

The finding is consistent with Efobi and Asongu (2016) for the case of Africa. In contrast, the interaction term of terrorism and military expenditures shows a significantly negative relationship towards capital flight, indicating that military spending helps to reduce terrorism and to control capital flight. The findings are consistent with earlier studies (e.g., Efobi and Asongu 2016; Asongua and Amoah 2017). Gross domestic products show significantly positive impact favoring capital flight, implying that economic growth in African and MENA countries leads to increased capital flight because capital flight is mainly dependent on external debts and net foreign direct investment. However, in the case of developing countries, external debt, foreign investments and foreign aid, etc., are diverted to other uses and are not included in economic development. Thus, the economic growth of African and MENA countries remains low, and movement of funds abroad is at its peak (Ajayi 2012).

The World Bank publication on Millennium Development Goals highlights that poverty is decreasing in all regions of the world except sub-Saharan African countries (World Bank 2015). Economic growth in MENA countries declined 2% in 2017 and now is approximately 3.1% per the World Bank (2018). Trade openness indicates significantly positive impact favoring capital flight, indicating that if trade restrictions are removed and trade becomes easy, the movement of money also becomes easy. The finding is similar to that of Efobi and Asongu (2016) for the case of African countries. The coefficient for political stability shows a significantly negative relationship, implying that a country being politically stable helps to reduce capital flight by 36% compared with unstable countries, because most of the countries in this panel are developing and politically unstable per the World Bank (2018). Exchange rate and inflation proved insignificant indicators in the model.

4.1 Robust analysis

In the case of full panel robust analysis, the study employed ordinary least squares, quantile regression and sequential estimation (two stage GMM) methods. The estimated results for robust analysis are reported in Table 3. The estimated coefficients of terrorist attacks, military expenditures and gross domestic product are significantly positive towards capital flight in all

three regression methods. The results imply that terrorist attacks and gross domestic product highly contribute to an increasing trend of capital flight because countries in both regions are not struggling enough to fight against terrorism and to improve economic growth. The interaction term of military spending and terrorism shows a significantly negative relationship with capital flight, indicating that more investment in defense helps to make a country peaceful and to control outflow movement of funds. Political stability shows a significant negatively impact in two-stage GMM and is insignificant in two methods. This result is quite surprising and demonstrates that political stability in these countries is very important. Political instability in African and MENA countries makes moving funds outside of a country easy. Trade openness showed a significantly positive relationship towards capital flight in ordinary least squares but proved an insignificant indicator in two models. Inflation and exchange rate proved insignificant indicators for capital flight.

Table 3. Robust analysis

Variable	OLS	Quantile Regression	Sequential estimation
TA	0.745***	0.7805***	0.7085***
ME	0.764***	0.9184***	0.7858***
INT	-0.725***	-0.8418***	-0.7243***
INF	-0.018	-0.0917	-0.0065
GDP	0.835***	0.9656***	0.9310***
TO	0.569*	0.2445	0.3781
ER	-0.056	0.0194	-0.0245
PS	-0.284	-0.2420	-0.3670**
Constant	7.754	7.0538	7.2157

TA is terrorist attacks, Me shows military expenditures, INT represents the interaction term of military expenditures and terrorist attacks, and INF presents the inflation. GDP presents gross domestic product per capita. TO shows trade openness, ER addresses exchange rate, and PS shows political stability. *, **, and *** represent the level of significance at 10%, 5% and 1%, respectively.

4.1.1 Quantile Regression Extended

In an attempt to examine the full panel results, the robust analysis is further extended in quantile regression. Quantile regression allows empirical investigation and cross checking of the results in different quantiles of the same empirical model. In this case, the study conducted four quantiles to check the impact of terrorism and military expenditures on capital flight. The results indicate that terrorism induces increased capital flight from sub-Saharan African and MENA countries. Surprisingly, the results also demonstrate that military expenditures do help to control capital flight, while it becomes a contributing factor to increased outflow of funds. This behavior occurs because the funds for military expenditures are spent from development projects and basic necessities, which lowers economic growth and increases risk to investments.

With regards to terrorism, more terrorism incidents in the region contribute to increased capital flight from the region. In addition, the interaction term highlights that military expenditures help to decrease the negative effect of terrorism on capital flight. Economic growth and trade openness have confirmed significantly positive impact favoring capital flight, confirming that growth and trade increase the outflow of funds because these countries are not properly utilizing funds and because aid and trade restrictions are not lifted, which does not attract investors but instead discourages them. Exchange rate and political stability have a confirmed insignificant relationship for capital flight. In summary, quantile regression highlights the same results as in pooled OLS and GMM. Figure A1 (appendix) illustrates the quantile regression in graphical form per the explanatory variables. The graphs demonstrate that terrorism, inflation, trade openness and exchange rate are the major contributing factors that fuel capital flight in the sub-Saharan African and MENA regions.

Table 4. Quantile Regression Extended in Quantiles

Variable	Q25	Q50	Q75	Q90
TA	0.704***	0.770***	0.662***	0.553***
ME	0.854***	0.902***	0.7519***	0.661***
INT	-0.780***	-0.826***	-.6767***	-0.620***
INF	0.115	-0.066	-.009	-0.04427
GDP	1.053***	0.943***	0.820	0.830***
TO	0.305***	0.3043	0.436*	0.821***
ER	-0.000	3.98	-0.000	-0.000
PS	-0.3588	-0.236	0.2693	-0.493**
Constant	5.30	7.090	8.59	8.497

TA is terrorist attacks, Me shows military expenditures, INT represents the interaction term of military expenditures and terrorist attacks, and INF presents inflation. GDP presents gross domestic product per capita. TO shows trade openness, ER addresses exchange rate, and PS shows political stability. *, **, and *** represent the level of significance at 10%, 5% and 1%, respectively.

4.2 Regional analysis

Diverting our attention to regional analysis, the study finds that for the case of sub-Saharan African countries, terrorism and military expenditures show a statistically significantly positive relationship, with coefficients of 0.608 and 0.677 towards capital flight, respectively. The finding demonstrates that increases in terrorist attacks are not good for the economy or capital flight of these countries. The finding is consistent with Asongua and Amoah (2017) and results from terrorism increasing every year in African countries. The sub-Sahara African region is now 4th in regional terrorism trends; most of the countries from this region are ranked in the top fifty countries in the terrorism index (Global terrorism Index 2017). With regard to the interaction between terrorism and the military, the empirical results show that military expenditures help to control capital flight with 66 to 71%. Exchange rate and political stability show significantly negative impacts on capital flight, with 17% to 23% for exchange rate and 74% to

91% for political stability. The finding implies that the exchange rate in sub-Saharan African countries induces increased capital flight because the exchange rates for these two countries have been unstable and have greatly evolved over time (Ghosh, Ostry and Tsangarides 2010). Political stability induces increased capital flight for African countries, because during the last two decades, these countries have remained politically unstable entities, and the government structure is not fixed. In addition, disturbances from political instability cause a negative investment climate (Fatehi and Gupta 1992). Inflation and trade openness are proved insignificant indicators in both models for capital flight. The empirical results for sub-Saharan African countries are reported in Table 5.

Table 5. Sub-Saharan African Region

Variable	Quantile Regression	Sequential estimation
TA	0.608**	0.677***
ME	0.810***	0.851***
INT	-0.662**	-0.712***
INF	-0.065	0.050
GDP	0.977*	0.868***
TO	0.210	0.224
ER	-0.234**	-0.173**
PS	-0.91445***	-0.742***
Constant	6.663886	6.565

TA is terrorist attacks, Me shows military expenditures, INT represents the interaction term of military expenditures and terrorist attacks, and INF presents inflation. GDP presents gross domestic product per capita. TO shows trade openness, ER addresses exchange rate and PS shows political stability. *, **, and *** represent the level of significance at 10%, 5% and 1%, respectively.

In the case of Middle Eastern and North African countries, the empirical estimates for terrorist attacks show that increases in terrorist attacks in

MENA countries induce increased capital flight because terrorism in these countries is at its peak; the MENA region is the second-ranked region in terrorism worldwide. Most of the countries in this region are ranked in the top fifty countries on terrorism (Global terrorism Index 2017). The interaction between the military and terrorism highlights that military expenditures help to control capital flight up to 70% for MENA countries, while there is a greater need to strengthen the law enforcement agencies and armed forces to implement regulations and to bring peace, which further leads to better economic growth and less movement of capital flows. The empirical findings confirmed inflation and trade openness as insignificant indicators for capital flight. Moreover, the exchange rate shows significantly negative impact on capital flight, indicating that consistency in exchange rate helps to control outflow movement of capital because from 1990 onward, the currency of Arabic countries has been stable, and MENA countries have strengthened their central bank independency with amendments to laws (International Monetary Fund 2014). Balassa (1990) also reached a similar conclusion for the case of African countries.

The empirical estimates for gross domestic product imply a significantly positive relationship with capital flight, indicating that economic growth leads to increased capital flight because external borrowings and foreign aid are not properly utilized in economic development of the economy and are diverted elsewhere. This problem causes low growth and leads to more outflow of capital (Ajayi 2012). Overall, the empirical results demonstrate that terrorist attacks, military expenditures, political stability and exchange rate play vital roles in capital flight. To control capital flight from both regions, there is a need to strengthen peace and harmony by making more investments in defense and the military, as military spending helps to fight against terrorism and to eliminate terrorist elements and groups from both regions. The empirical findings for Middle Eastern and North African countries are reported in Table 6.

Table 6. Middle Eastern and North African Region

Variable	Quantile Regression	Sequential estimation
TA	0.4672***	0.5295**
ME	0.5536***	0.5617**
INT	-0.4714***	-0.5048**
INF	-0.0424	-0.0150
GDP	0.8478***	0.7613***
TO	0.1411	0.2420
ER	-0.0287	-0.0191
PS	0.0772	-0.0725
Constant	10.5188	10.7103

TA is terrorist attacks, Me shows military expenditures, INT represents the interaction term of military expenditures and terrorist attacks, and INF presents inflation. GDP presents the gross domestic product per capita. TO shows trade openness, ER addresses exchange rate, and PS shows political stability. *, **, and *** represent the level of significance at 10%, 5% and 1%, respectively.

5 Conclusion and Policy Implications

The objectives of the present study are to investigate the role of terrorist attacks in increasing capital flight from sub-Saharan African and MENA countries and to investigate whether military expenditures and defense measures are worthwhile to control the rapidly increasing pace of capital flight. For capital flight, we study the role of economic growth, trade openness, inflation, exchange rate and political stability used as a proxy of security and peace. The important contribution of the paper is inclusion of the capital flight trap, military expenditures and political stability, which are important factors in reducing capital flight from sub-Saharan African and Middle Eastern and North African countries. The study used the yearly data of 15 sub-Saharan African and 14 Middle Eastern and North African countries from 1990–2015. The study highlights two kinds of analysis: first, we used both regions as a full sample for econometric estimations; second, separate empirical estimations are conducted for each region.

The results of the present study demonstrate that terrorist attacks, economic growth and trade openness are important contributors to capital

flight in the case of the full sample and of regional analysis. The interaction between terrorist attacks and military expenditures is also confirmed as a key policy variable to reduce terrorism and eliminate the terrorism effect on capital flight. Therefore, Middle Eastern and North African countries have seen a drastic increase in military spending from 3% of GDP to 4.5%. Saudi Arabia military spending has increased to 8.9% of its GDP and has become the third-ranked country in military spending following only the USA and China (Gaub 2014; International Trade Administration 2016). In addition, the study has empirically proved that among all economic factors, trade and gross domestic product induce increased capital flight from both regions because external borrowings and funds are not properly utilized for economic development. This problem causes an outflow of funds abroad, and trade liberalization provides relaxed relations, thereby facilitating conducting business in other parts of world. People enjoy the benefits of such relaxation by shifting money abroad. Moreover, inflation and exchange rate have proved insignificant factors for the full panel and for the Middle Eastern and North African countries. Concerning the sub-Saharan African region, exchange rate shows a significantly negative relationship, indicating that a stable exchange rate helps to reduce capital flight from the region. This study examines the role of political stability as a proxy factor for peace and stability, and the results highlight that political stability helps to control capital flight. However, in most of the countries included in the sample, the political environment is not very stable, and there is much need to create politically stable and peaceful environments.

The results of the present study help policymakers to make stable rules and policies for a peaceful and economic friendly environment to mitigate the increasing pace of capital flight. Both regions need immediate operational measures in their economic sectors to improve the living standard of people and to mitigate terrorism and violence. For example, more monetary resources should be spent on people's welfare and for economic development. The countries should take necessary measures and form strict rules to stop shifting money to tax havens, and siphoned funds should be taken back from abroad. In addition, military spending should be increased in such a way that funds for welfare and developmental projects should not be used for the military, and funds should not be in the hands of a corrupt elite. Political instability and weak government effectiveness make it easy to shift money from developing countries to tax havens. This situation demands serious measures in the areas of governance methods, institutional quality and stable political environment.

The present study mainly studied terrorism, military expenditure and political stability as important influencing factors for capital flight. The study omits some important factors concerning capital flight, such as institutional quality, corruption control, and internal and external conflicts, etc., because the study examined the role of economic indicators for capital, such as economic growth, trade, inflation, and exchange rate, etc., which cannot be considered negligible. With regard to future research, our study highlights that the capital flight literature can be extended by engaging more policy variables such as corruption control, government effectiveness, internal conflicts and inclusive development. Furthermore, conducting this analysis regarding country-specific effects can provide more detailed policy measures and military spending thresholds.

References

Abadie A., Gardeazabal J. (2008), *Terrorism and the world economy*, European Economic Review, 55, 1-27.

Africa Economic Development Institute (2018), *Data Bank for African Countries*, Africa Economic Development Institute.

Ajayi L. (2012), *Capital Flight and Nigeria Economic Growth*, Asian Journal of Finance & Accounting, 4(2), 277-290.

Amankwah-Amoah J. (2016), *Ebola and Global Airline Business An Integrated Framework of Companies' Responses to Adverse Environmental Shock*, Thunderbird International Business Review, 58(5), 385-395.

Anwar A., Arshed N., Anwar S. (2014), *The Nexus Between Terrorism, Investment and Growth: An Analysis of Muslim Developing Countries*, Global and Local Economic Review, 21(1), 23-40.

Arellano M., Bond S. (1991), *Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application toEmployment Equations*, The Review of Economic Studies, 58(2), 277-297.

Ashraf Q. (2013), *The 'Out of Africa' Hypothesis, Human Genetic Diversity, and Comparative Economic Development*, American Economic Review, 103(1), 1-46.

Asongu S. (2014b), *Fighting African Capital Flight: Empirics on Benchmarking Policy Harmonization*, The European Journal of Comparative Economics, 11(1), 93-122.

Asongu S., Nwachukwu J. (2016), *Foreign aid and governance in Africa*, International Review of Applied Economics, 30(1), 69-88.

Asongu S., Nwachukwu J. (2016a), *Rational Asymmetric Development, Piketty and Poverty in Africa*, African Governance and Development institute, Working paper 15(006).

Asongu S., Nwachukwu J. (2017), *Fighting Terrorism: Empirics on Policy Harmonisation*, German Economic Review, 1-23.

Asongua S., Amoah J. (2017), *Mitigating capital flight through military expenditure: Insight from 37 African countries*, Research in International Business and Finance.

Balassa B. (1990), *Incentive Policies and Export performance in Sub-Sahara Africa*, World Development, 18(3), 383-391.

Baltagi B. (2008), *Forecasting with panel data. Forecasting with panel data*, 27(2), 153-173.

Bandyopadhyay S., Sandler T., Younas J. (2014), *Foreign direct investment, aid, and terrorism*, Oxford Economic Papers, 25, 25-50.

Batuo M. (2015), *The role of telecommunications infrastructure In the regional economic growth of Africa*, Journal of Development Areas, 49(1), 313-330.

Beja E. (2006), *Revisiting the Revolving Door: Capital Flight from Southeast Asia*, Department of Economic and Social Aff airs United Nations, 1-32.

Bois C., Buts C. (2014), *Military support and transnational terrorism*, Defence and Peace Economics. doi:10.1080/10242694.2014.972087.

Bond S., Hoeffler A., Temple J. (2001), *GMM Estimation of Empirical Growth Models*, Economics Group, Nuffield College University of Oxford.

Boyce J., Ndikumana L. (2012), *Capital Flight from Sub-Saharan African Countries Updated Estimates*, 1970 - 2010. Political Economy Research Institue. Retrieved 05 08, 2018, from http://www.peri.umass.edu/fileadmin/pdf/ADP/SSAfrica_capitalflight_Oct23_2012.pdf.

Cheung Y.W., Steinkamp S., Westermann F. (2016), *China's capital flight: Pre- and post-crisis experiences*, Journal of International Money and Finance, 66, 88-112.

Costantini M., Lupi C. (2005), *Stochastic convergence among European economies*, Economics Bulletin, 3(38), 1-17.

Czinkota M., Knight G., Steen J., Liesch P. (2010), *Terrorism and international business: a research agenda*, Journal of International Business Studies, 41(5), 826-843.

David O. (2005), *Countering international terrorism: The use of strategy*, Global Politics and Strategy, 47(4), 107-116.

Davies V. (2011), *Capital Flight and Violent Conflict*, Washington DC:

World Development Report.

Donnell D. (2006), *International treaties terrorism and the use of terrorism during armed conflict and by armed forces*, International Review of Red Cross, 88(864), 853-880.

Efobi U., Asongu S. (2016), *Terrorism and capital flight from Africa*, International Economics, 148, 81-94.

Ellyne M., Mbewe S. (2015), *Capital Flight and the role of the Exhange Rate in Nigeria, South Africa and Zambia*, Working paper University of Cape Town.

Eyerman J. (1998), *Terrorism and democratic states: Soft targets or accessible systems*, International Interactions, 24(2), 151-170.

Fatehi K., Gupta M. (1992), *Political Instability and Capital Flight: An Application of Event Study Methodology*, The International Executive, 34(5), 441-461.

Fazel A. (2013), *The growing terrorism threat in Africa*, Retrieved from https://mg.co.za/: https://mg.co.za/article/2013-12-17-the-growing-terrorism-threat-in-africa.

Feridun M., Shahbaz M. (2010), *Fighting terrorism: are military measures effective? empirical evidence from Turkey*, Defence and Peace Economics, 21(2), 193-205.

Fielding D. (2004), *How Does Violent Conflict Affect Investment Location Decisions? Evidence from Israel During the Intifada*, Journal of Peace Research, 41(4), 465-484.

Filer R., Stanisic D. (2016), *The Effect of Terrorist Incidents on Capital Flows*, Review of Development Economics, 20(2), 502-513.

Gaub F. (2014), *Arab military spending: behind the figures*, Paris, France: European Union Institute for Security Studies.

Ghosh A.R., Ostry J.D., Tsangarides C. (2010), *Exchange Rate Regimes and the Stability of the International Monetary System*, International Monetry Fund.

Global Terrorism Database (2015), *Terrorism Data,* Retrieved from http://www.start.umd.edu/gtd/contact/

Global Terrorism Index (2014), *Global Terrorism Index Report*, Sydney, Australia: Institute for Economics and Peace.

Global terrorism Index (2017). Global terrorism Index . Institute for Economics and Peace. Retrieved from http://economicsandpeace.org/wp-content/uploads/2016/11/Global-Terrorism-Index-2016.2.pdf

Gunter F. (2008), *Capital flight,* In W. A. Darity (Ed.), InW. A. DarityJr.

(Ed.), (pp. 434-436). Detroit: International encyclopedia of the social sciences, Macmillan Reference.

Hermes N., Lensink R. (2001), *Capital flight and the uncertainty of government policies*, Economics Letters, 71(3), 377-381.

International Trade Administration. (2016, October 31). https://www.trade.gov. Retrieved 05 09, 2018, from https://www.trade.gov/topmarkets/pdf/Defense_Middle_East.pdf

Interntioal Monetry Fund, (2014), *World Economic and Financial Surveys*, World Economic Outlook. Washington DC: Interntioal Monetry Fund.

Kaufmann D., Kraay A., Mastruzzi M. (2010*), The Worldwide Governance Indicators: Methodology and Analytical Issues*, World Bank Policy Research Working Paper No. 5430. World Development Bank. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1682130

Kelsey D., Le Roux S. (2016), *Dragon slaying with ambiguity: theory and experiments*, Journal of Public Economy Theory, 00(0), 1-20.

Koh, W.T. (2007), *Terrorism and Its Impact on Economic Growth and Technological Innovation*, Technological Forecasting and Social Change, 74(2), 129-138.

Kripfganz S., Schwarz C. (2015), *Estimation of Linear Dynamic Panel Data Models with Time-Invariant Regressors*, European Central Bank Working Paper No. 1838. Retrieved from https://ssrn.com/abstract=2650425

Kuepper J. (2018, march 22), https://www.thebalance.com/, Retrieved from https://www.thebalance.com/globalization-and-its-impact-on-economic-growth-1978843.

Lum C., Kennedy L., Sherley A. (2006a), *The Effectiveness of Counter Terrorism Terrorism Strategies*, Campbell Systematic Reviews, 2.

Lum C., Kennedy L., Sherley A. (2008b), *Is counter-terrorism policy evidence-based? What works, what harms, and what is unknown*, Psicothema, 20(1), 35-42.

Makochekanwa A. (2007), *An Empirical Investigation of Capital Flight from Zimbabwe*, University of Pretoria, 1-39.

Narayan P. K., Mishra S., Narayan S. (2011), *Do market capitalization and stocks traded converge? New global evidence*, Journal of Banking & Finance, 35(10), 2771-2781.

Ndikumana L., Boyce J. (2011), *Africa's Odious Debts. In How Foreign Loans and Capital Flight Bled a Continent (African Arguments)*, London: University of Chicago Press Books.

Ndikumana L., Boyce J., Ndiaye A.S. (2015), *Capital Flight: Measurement and Drivers. In S. I. Ajayi, Capital Flight from Africa: Causes*

Effects and Policy Issues, Oxford University Press.

Sandler T. (2005), *Collective versus unilateral responses to terrorism*, Public Choice, 124, 75-93.

Stibili F. (2010), *Terrorism in the context of globalization*, Aarms, 9(1), 1-7.

The World Bank. (2018). Middle East and North Africa . Retrieved 05 06, 2018, from http://www.worldbank.org/en/region/mena/overview

United Nations (2014), International Legal Instruments. Retrieved from United Nations http://www.un.org/en/counterterrorism/legal-instruments.shtml

University of Massachusetts. (2016). *Capital Flight from Africa. Amherst, MA*: Political Economy Research Institute. Retrieved from https://www.peri.umass.edu/capital-flight-from-africa

Le Q.V., Zak P.J. (2006), *Political Risk and Capital Flight*, Journal of International Money and Finance, 308-329.

Weeks J. (2015), *Macroeconomic Impact of Capital Flight in Sub-Saharan Africa*, Capital Flight from Africa Causes, Effects and Policy Issues Oxford: Oxford University Press.

Williamson J. (1985), *The Exchange Rate System (Policy Analysis in International Economics*, Institute of International Economics, 5.

World Bank (1985). World Development Report . Washington DC: World Development Bank.

World Bank (2015). World Development Indicators. World Bank Publications. Retrieved from http://www.gopa.de/fr/news/world-bank-release-world-development-in

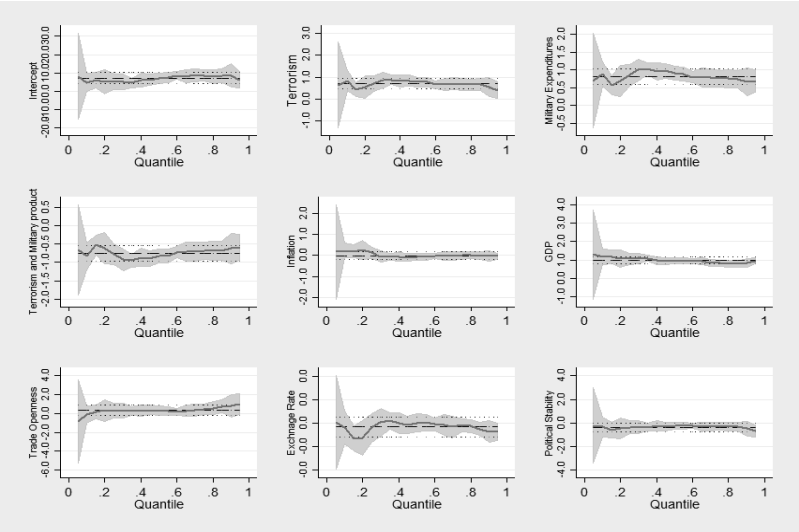
World Development Indicators (2015). World Development Bank . Retrieved 04 20, 2018, from http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#

Appendix

Table A1: Region and Country List

Region	Country
Sub-Sahara Africa	Nigeria, Somalia, DR Congo, South Africa, Cameroon, Central African Republic, Niger, Kenya, Ethiopia, Mali, Burundi, Chad, Mozambique, Burkina Faso, Uganda, Iraq, Syria, Yemen, Libya, Egypt, Sudan, Saudi Arabia
Middle East and North Africa	Lebanon, Israel, Tunisia, Algeria, Kuwait, Jordan, Iran

Figure A1: Quantile Graph



G. & L. E. R., Vol. 23 No. 1, 2019

Muhammad Ateeq ur Rehman[*], Muddassar Sarfraz[†], Syed Ghulam Meran Shah[‡]

WHETHER CURRENT INCREASE IN DEBT DEPENDS ON THE PREVIOUS LEVEL OF DEBT: A CASE OF THE PAKISTANI ECONOMY

Abstract

The primary purpose of this study is to investigate whether the current increase in debt depends on the previous level of debt with relation to the Pakistani economy. A time-series data analysis from 1975 to 2016 is used to find the relation between economic basis and debt volatility. Debt volatility is treated as a dependent variable, and external debt stock as a percent of GDP is taken as a measure of debt volatility, while growth rate, interest payment, and inflation are taken as control variables in the model. Different model specifications are used for the empirical analysis. A negative relation is identified between growth and debt volatility, while interest payment is positively related to debt volatility. An ARIMA model confirms that the current value of debt also depends on the previous debt and that it supports the theory of serial default related to the Pakistani economy.

JEL CLASSIFICATION: E00, G18, O11, E50
KEYWORDS: SERIAL DEFAULT, EXTERNAL DEBT, ECONOMIC GROWTH, DEBT VOLATILITY, PAKISTAN

[*] Research Institute of Economics and Management, Southwestern University of Finance and Economics, Chengdu, China and Gutenberg School of Economics and Management, Germany, Phone: +86-15928822076; Email Address; ateeq@smail.swufe.edu.cn

[†] Department of Management and HR, Business School, Hohai University, Nanjing, 210098, Jiangsu, China, Phone: +86-18751861057; *Email Address*; muddassar@hhu.edu.cn

[‡] Department of Business Administration, Southwestern University of Finance and Economics, Chengdu, China, Phone: +86-18200400534; *Email Address*; ghulam_meeran2001@yahoo.co.in

1. Introduction

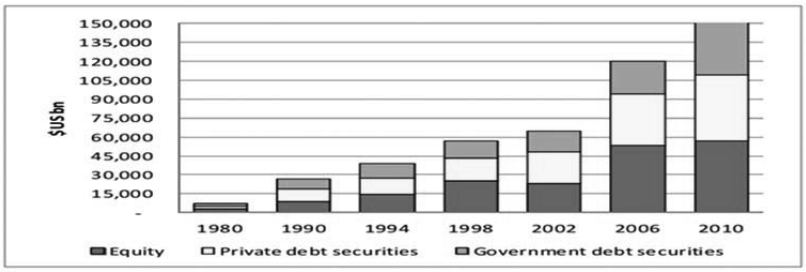
The reason for the level of debt being dissimilar among countries is the most controversial and relevant issue of emerging economies because of resource constraints and conditions imposed by donors. The efficient use of resources boosts the economy, while inefficiency increases the economic burden. A country has to borrow more to release the previous obligation, which annihilates the economic fundamentals that push the relative economy into a 'vicious circle of debt', and gradually, the country moves toward default. Subsequently, if the economy does not take action to remove the flawed economic policies, then the country again defaults. As a result, the economy moves toward a 'serial default hypotheses' theory, which examines the debt intolerance point of the economy. However, different absorption levels of debt can be a result of the difference in economic fundamentals and size. Nevertheless, the economic institutions and economic policies play an important role to keep the economy headed in the right direction to sustain investor confidence.

It is impossible to grow without debt, and the need for debt is increasing globally day by day. The capital composition between 1980 and 2010 reached $150 bn of which more than $90 bn of capital was debt, showing the utilization of the debt instrument, the reaction of policy reforms and the variation in economic fundamentals, as shown in Figure 1. The primary aim of this study is to investigate whether the current increase in debt depends on the previous level of debt as related to the Pakistani economy.

The annual time-series data from 1975 to 2016 are collected from the World Bank database, where the external debt stock to GDP is used as a measure of debt volatility, while inflation, GDP growth rate, and interest payment are used as control variables. The analysis confirms the repeated default and supports the theory of serial default examined by (Reinhart and Rogoff 2009).

The rest of the paper is structured as follows: section 2 presents the extant literature, while section three discusses the methodology of the contemporary work. The next section presents the data, results, and discussion, while the last section concludes.

Figure 1. Global Security Stock from 1980-2010 ($ US bn)



Deposits	5,000	16,000	18,000	22,000	29,000	45,000	59,000
GPD	11,000	22,000	26,000	30,000	33,000	49,000	63,000

Source Lysandrou (2011)

2. Literature Review

The institutional and political environment cannot be ignored in an economic analysis. Giordano and Tommasino, (2011) theoretically describe the importance of the political environment in association with the decision to default or not to default. However, the default condition is a gradual process adopted by the institutional environment. Diaz-Cassou, Erce, and Vázquez-Zamora (2008) discuss the active role of institutions in economic affairs and economic empowerment. They investigate that international lending units play a significant role in pushing the economy on the right track at the time of financial distress. Park and Song (2011) examine the useful role of macroeconomic factors (inflation and interest rate spread), known as "conditioning factors''. They determine the solvency and threshold level of an economy. Sharaf (2015) argued the importance of inflation and suggested the targeted inflation policy to reduce uncertainty.

The relation between financial development and economic growth cannot be ignored in economic analysis. (Sanogo and Moussa 2017) investigate the negative relation between credit and economic growth. Subsequently, (Bannister and Barrot 2011) illustrate the importance of macroeconomic factor volatility in predicting debt tolerance. They investigate the role of growth and inflation to determine debt intolerance and find a positive relationship between economic growth and debt tolerance. However, (Bordo, Meissner, and Stuckler 2010) state that a high debt level leads to a decrease in growth and leads the economy into a default situation.

Furthermore, (Catão, Fostel, and Kapur 2009) investigate the relation

between the current default and the past avoidance of default and find that high debt increases the fixed cost and brings the economy toward serial default. (Pardo Caicedo 2012) describes different conditions of economic crises. First, 'original sin', known as debt, is a significant problem for the underdeveloped economy, which increases the fixed cost during crises. Meanwhile, additional debt is required to meet the current deficit known as the "balance sheet effect", which leads to the point of default. Second, the debt tolerance level is not the same for advanced and developing economies because of the difference in financial and institutional structure.

Therefore, emerging economies react differently to the developed economy in times of high debt burden because of a low absorption level. In contrast, (Bordo and Meissner 2005) state that a high debt-to-GDP ratio does not matter in the presence of a strong economic structure. On the other hand, a high export level increases the relative confidence level even though the relative debt-to-GDP ratio is high. Consequently, a well-built economic base is the backbone of the financial fundamental that boosts the interrelated economic activities. Conversely, a weak economic structure increases the debt burden and its relative cost. Hence, a spillover effect of debt liability destroys the banking and monetary system, and the economy is forced into a vicious circle of debt. The following hypothesis has been developed based on the previous literature.

H0: The current default has no association with the previous default.

3. Methodology

The empirical analysis includes the annual time-series data set from 1975 to 2016 related to the Pakistani economy using World Development Indicators. The external debt stock-to-GDP (EXDGDP) ratio as a proxy for debt volatility is used as a dependent variable. Jafri (2008) has used the same ratio to determine the debt threshold level where inflation, GDP growth rate, and interest payment are used as the control variables in the model. Additionally, inflation (INF) is used as an explanatory variable of the study, and it is expected that a high value of inflation is not suitable for the economy. Gross domestic product (GDP) is the backbone of an economy and is extensively used as a measure of output regarding services and production. GDP is an instrument to not only check the size of an economy but also to investigate whether the economy is contracting or expanding. Therefore, GDP growth cannot be ignored at the time of economic analysis.

GDP growth rate (GDPG) is used as a measure of debt intolerance because high income growth countries need more debt to meet production and consumption needs. Debt rescheduling pushes the country into a vicious circle of default. Interest payment (INTPMT) is also used as a measure of debt volatility, as (Thornton 2004) has also used the same measure to control the debt threshold level. A general model has been developed using EXGD as a measure of debt volatility, where GDPG, INF, and INTPMT are considered exogenous variables in the model. Equation (1) shows the mathematical form of the model, and equation (2) shows the functional form of the lag of control variables with EXDGDP.

$$EXDGDP_t = \beta_o + \beta_1 GDPG_t + \beta_2 INF_t + + \beta_3 INTPMT_t + \varepsilon_t \quad (1)$$

$$EXDGDP_t = \beta_o + \beta_1 GDPG_t + \beta_2 INF_t + + \beta_3 INTPMT_t$$
$$\beta_1 GDPG_{t-i} + \beta_2 INF_{t-i} + + \beta_3 INTPMT_{t-i} + \varepsilon_t \quad (2)$$

where β_o is the slope intercept, β_1, β_2 *and* β_3 are the estimates of the model, while 'ε_t' demonstrates an unexplained part of the model. To investigate the 'serial default condition,' ARMA is applied (p,q) as shown in equation (3).

$$\text{EXDGDP}_t = C_o + \sum_{i=1}^{p} \phi_i \text{EXDGDP}_{(t-i)} + \sum_{i=1}^{q} \theta_i \varepsilon_{t-1} + \varepsilon_t$$
$$i = 1, 2, ...n \quad (3)$$

w $\phi_i .....\phi_p$ and $,\theta_i .....\theta_q$ are the parameters of interest and ε_t follows a white noise process. Mendoza (2009) also investigates the effect of previous default on the current state of an economy. Moreover, partial and autocorrelation techniques have been used to investigate the serial correlation of EXGD with its lag, as shown in equations (4) and (5).

$$\rho_s = \frac{\sum_{t=s+1}^{T} EXDGDP_t^* EXDGDP_{t-s}^*}{\sum_{t=s+1}^{T} EXDGDP_t^{*2}} = \frac{\gamma_s}{\gamma_0} \tag{4}$$

$$EXDGDP = \theta_0 + \theta_1 EXDGDP_{t-1} + ... + \theta_1 EXDGDP_{t-s} + \varepsilon_t \tag{5}$$

$$AIC = \ln \sigma^2 + k\frac{2}{T} \tag{6}$$

$$BIC = \ln \sigma^2 + k\frac{\ln T}{T} \tag{7}$$

4. Discussion

Table 1 describes the summary statistics from 1975 to 2016. The mean value of EXDGDP is approximately 26%, with a maximum and minimum value of 35% and 17%, respectively. Overall, the mean value of the control variables is not more than 8%, with a standard error between 2% and 14%. However, a negative correlation is captured among variables, except for in some cases. For instance, INTPMT and EXDGDP have a positive correlation with GDPG and INF, approximately 2.3% and 3%, respectively, as shown in Table 1.

Table 1. Summary Statistics (1975-2016)

Variables	OBS	Mean	Std. Dev.	Min.	Max.
GDPG	42	4.89	2.07	1.01	10.21
INF	42	8.54	4.15	2.54	20.90
INTPMT	42	7.44	14.02	-21.57	33.74
EXDGDP	42	26.49	4.08	17.90	35.40

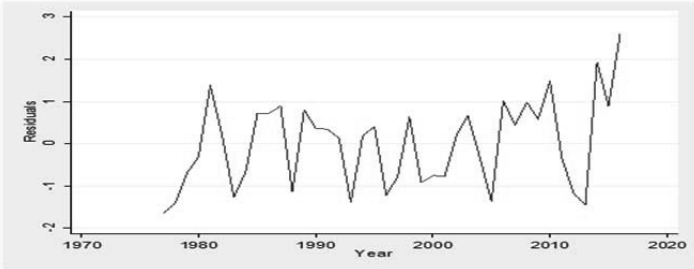
Table 2 shows an insignificant relation between the control variables and EXDGDP. Weak explanatory power, of approximately 32%, further suggests the serial correlation problem, as shown in model (1).

Table 2. Regression Results (1975-2016)

EXDGDP	**(1)**	**(2)**	**(3)**
Cons	32.52***	8.82***	28.71***
	(16.37)	(3.76)	(9.93)
GDPG	-0.9	-0.31**	
	(-3.62)	(-2.84)	
INF	-0.08	0.14***	
	(-0.63)	(2.20)	
INTPMT	-0.06	0.04**	
	(-1.39)	(2.56)	
GDPG_L		-0.34**	
		(-2.94)	
INF_L		0.01	
		(0.18)	
INTPMT_L		-0.003	
		(-0.1)	
EXDGDP_L		0.74***	
		(11.20)	
AR			
L1			1.48***
			(11.55)
L2			-0.45***
			(-3.87)
MA			
L3			-0.55***
			(-3.62)
χ^2			0.48
AIC			159.02
BIC			167.71
R^2	0.32	0.9	
OBS	42	41	42

Conversely, the explanatory power of the model is increased to 92% using the lagged control variables. Moreover, the beta coefficients of GDPG (-0.31), INF (0.14), INTPMT (0.04), GGPG_ L (-0.34) and EXDGDP_L (0.74) are significantly different from zero, except for INF_L (0.01) and INTPMT_L (-0.003), as shown in model (2) of Table 2.

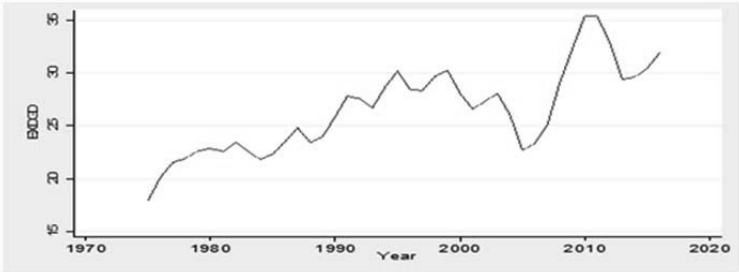
Figure 2. Predicted Residual Trend (1975-2016)



Source: own calculation by using data from World Development Indicators (1975-2016)

The predicted residual behavior from 1975 to 2016 clearly states the time trend, as shown in Figure 2, which confirms an autocorrelation problem in the model.

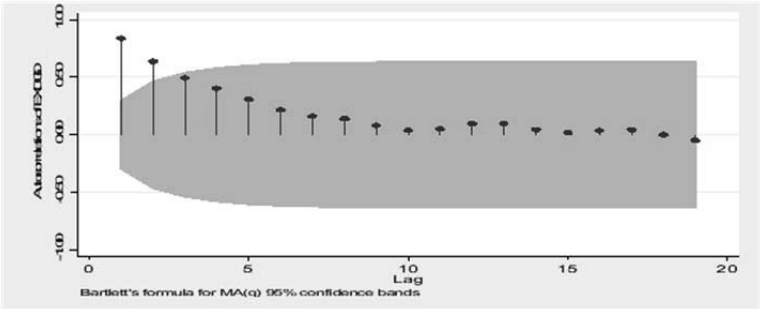
Figure 3. Time Trend of External Debt Stock to GDP from 1975 to 2016



Source: own calculation by using data from World Development Indicators (1975-2016)

Subsequently, Figure 3 states the relation between EXDGDP and time and leads to the investigation of the ARIMA process in the model.

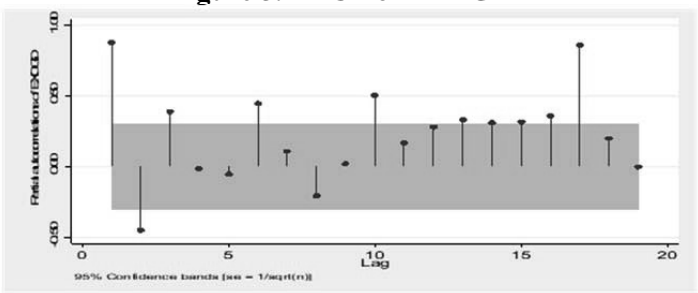
Figure 4. ACF of EXDGDP (1975-2016)



Source: own calculation using data from World Development Indicators (1975-2016)

The autocorrelation function (ACF) of EXDGDP has a smooth decay toward its mean, and a gradual decrease in serial correlation is well defined, as shown in Figure 4, which figuratively confirms the strong dependency of the current information on the previous information. However, the relation is following the autoregressive process as well.

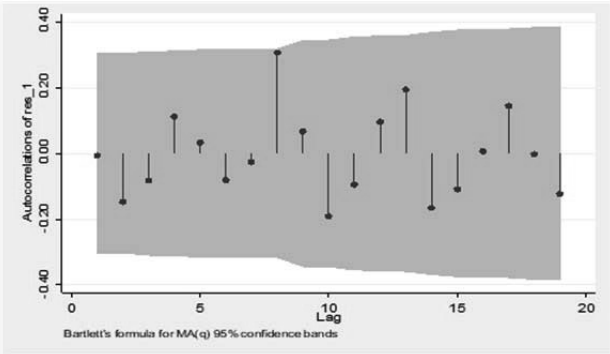
Figure 5. PACF of EXDGDP



Source: own calculation using data from World Development Indicators (1975-2016)

Moreover, the partial autocorrelation function (PACF) of EXDGDP symbolically confirms the order of the time-series data, as shown in Figure 5.

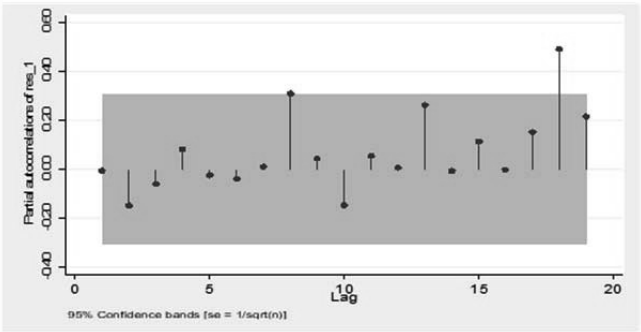
Figure 6. ACF of Predicted Residual (1975-2016



Source: own calculation using data from World Development Indicators (1975-2016)

Further, the white noise process confirms the autocorrelation in the error terms, as shown in Figure 6, which leads the analysis toward information criteria.

Figure 7. PACF of Predicted Residual (1975-2016)



Source: own calculation using data from World Development Indicators (1975-2016)

The PACF of the predicted residuals also captures a lagged trend, as shown in Figure 7, with a specific order.

Similarly, model (3) confirms the AR process with an order of 2, and the parameters ϕ_1 (1.48) and ϕ_2 (-0.45) are significantly different from zero. An information criterion has selected ARIMA (2, 3), as shown in Table 2. ϕ_1 (1.48), ϕ_2 (-0.45) and θ_1 (-3.54) are significantly different from zero, while AIC (169.02) and BIC (167.71) also confirm that the ARIMA (2,3) is the

best model for prediction.

Hence, the results support the idea that the current information depends on the previous information. The most significant results are generated from model (2) and model (3). Consequently, the results support the theory of serial default, as discussed in the previous literature by (Mendoza 2009; Catão, Fostel, and Kapur 2009; Reinhart and Rogoff 2009; Bordo, Meissner, and Stuckler 2010). Therefore, it is not possible for emerging economies to absorb the level of debt beyond an absolute limit of debt. The study examines the reasons for default, and one of them is a weak institutional setup that pushes the economy into a worse situation (Reinhart and Rogoff 2009).

Pakistan is also facing the same problem, and Pakistan has to issue more debt to remove the debt burden, perfectly reflecting the quotation "the country defaults once also defaults in the future''. The result is serial default, and the country exists in group IV compared to the category described by (Reinhart and Rogoff 2009). Therefore, Pakistan is more likely to default in the near future and face debt again. Apart from this, some other unobservable factors hidden in the disturbance term also determine the level of debt intolerance, and those factors could be political or institutional.

A long-term policy can help to get rid of an uncertain environment, while corrective actions can lead to the stabilization of the institutional environment. Unfortunately, Pakistan has no long-term economic policy, and if such a policy is implemented, the next government will roll back the policy implemented by the previous government, which shows an inconsistent economic phenomenon.

5. Conclusion

"This time is a different syndrome'' is the most fundamental economic issue raised by (Reinhart and Rogoff 2009), and nothing is static in this dynamic economic world. Thus, the economic fundamentals can never be static under the umbrella of unobservable dynamic economic shocks. Consequently, emerging economies are facing a large problem of the repayment of debt and have become more debt-intolerant currently compared to the previous economic environment. The main aim of the study is to investigate whether the current increase in debt depends on the previous level of debt related to the Pakistani economy. A time-series data analysis from 1975 to 2016 is used to find the relation of economic basis with debt volatility. External debt stock as a percent of GDP is used as a measure of

debt volatility, while GDP growth rate, interest payment, and inflation are used as the control variables in the model. Different model specifications are used for the empirical analysis, and different methods are applied to find a relation. A negative relation is identified between growth and debt intolerance, while interest payment is negatively but insignificantly correlated with external debt to GDP, except in specification (2). Thornton (2004) uses the same explanatory measure to analyze the debt volatility level. Conversely, inflation is positively correlated with debt volatility, except in specification (1). Consequently, the ARIMA model confirms that the current value of debt also depends on the previous debt, which supports the theory of serial default.

Policy Implication

The government of Pakistan should rethink its foreign debt and capital structure policy because it will increase the debt burden on the economy. Furthermore, the government should balance capital inflow and outflow, which cannot be possible in the absence of weak institutional structure. Additionally, prudential improvements are required to increase the level of efficiency, which can decrease the intolerant debt problem for the Pakistani economy. Gallagher (2011) also illustrates that an international investment agreement and clear prudential improvement can be the best solution to increase the debt tolerance level. Additionally, the fixed burden should be reduced by implementing effective economic reforms to increase the fiscal surplus.

Contrary to this, if the government does not take corrective actions, then the financial loss will lead to rescheduling the debt obligation. Thus, an optimal debt policy should be adopted by the government of Pakistan as the leading solution for the economy. Moreover, diversification could be the best tool to sustain the Pakistani economy. Iheanacho (2016) describes that external shocks cannot destroy the economy in the presence of a well-diversified economy.

This study does not adequately disclose the problem of debt intolerance and the safest threshold level for the Pakistani economy. In-depth analyses can be taken into account for further research, while economic size, capitalization, and the political and institutional index can be taken as a measure of debt intolerance for the economy.

References

Bannister G.J., Barrot L.D. (2011), *A Debt Intolerance Framework Applied to Central America, Panama, and the Dominican Republic*, International Monetary Fund.

Bordo M.D., Meissner C.M., Stuckler D. (2010), *Foreign Currency Debt, Financial Crises, and Economic Growth: A Long-Run View,* Journal of International Money and Finance 29(4),642-665, https://doi.org/10.1016/j.jimonfin.2010.01.002.

Bordo M.D., Meissner C.M. (2005), *Financial Crises, 1880-1913: The Role of Foreign Currency Debt,* NBER Working Paper, 1880-1913, https://doi.org/10.3386/w11173.

Catão, L.A.V., Fostel A., Kapur S. (2009), *Persistent Gaps and Default Trap,.* Journal of Development Economics 89(2),271-284, https://doi.org/10.1016/j.jdeveco.2008.06.013.

Diaz-Cassou J., Erce A., Vázquez-Zamora J.J. (2008), *Recent Episodes of Sovereign Debt Restructurings: A Case-Study Approach.*

Gallagher K.P. (2011), *The New Vulture Culture: Sovereign Debt Restructuring and Trade and in-Vestment Treaties,* IDEAs Working Paper, no. 02.

Giordano R., Tommasino P. (2011), *What Determines Debt Intolerance? The Role of Political and Monetary Institutions*, European Journal of Political Economy 27(3),471-484, https://doi.org/10.1016/j.ejpoleco.2011.02.001.

Iheanacho E. (2016), *The Impact of Financial Development on Economic Growth in Nigeria: An ARDL Analysis,* Economies 4(4), 1-12.

Lysandrou, P. (2011), *Global Inequality, Wealth Concentration and the Subprime Crisis: A Marxian Commodity Theory Analysis*, Development and change, 24(183-208).

Jafri S.K. (2008), *External Debt Sustainability Analysis for Pakistan: Outlook for the Medium Term,* State Bank of Pakistan, Research Department.

Mendoza R.U. (2009), *A Review of Financial Stability Instruments for Emerging Market Economies,* CESifo Economic Studies, https://doi.org/10.1093/cesifo/ifn035.

Pardo Caicedo E. (2012), *European Crisis: To Quit or Not Quit the Euro, Balance Sheet Effects.*

Park B., Song W. (2011), *Determinants of Domestic Public Debt Crisis.*

Reinhart C.M., Rogoff K.S. (2009), *This Time Is Different. Eight Centuries of Financial Folly.*

Sharaf M.F. (2015), *Inflation and Inflation Uncertainty Revisited: Evidence from Egypt*, Economies, 3(128-146).

Sanogo V., Moussa R.K. (2017), *Financial Reforms, Financial Development, and Economic Growth in the Ivory Coast*, MDPI Economies, (1),1-23, https://doi.org/10.3390/economies5010007.

Thornton J.N. (2004), *International Debt Sustainability,* Reconciling Debt Intolerance with Original Sin.